Appendix to *Locality domains in syntax: Evidence from sentence processing*

A *Plausibility norming*

A.1 *Experiment 1*

As in G&W's experiment, the semantic relations in the DP and CP condition differed in Experiment 1. Thus, in (4a) it is the accusations that hurt the secretary, while it is the claim or boast about such accusations in (4b). The verb type manipulation introduces a second potential source for plausibility differences between the conditions. Because plausibility considerations are well-known to affect parsing decisions, a plausibility norming study on the experimental items was conducted. Because the semantic relations within any given item in Experiment 1 did not change between the [+move] and [–move] conditions, only the latter were included in the norming study. The norming experiment hence contained four versions of each item, corresponding to (4a.ii) and (4b.ii) above, thus crossing the factors *intervener* and *verb type.* All sentences were accompanied by the respective context-sentence but were not followed by a comprehension question. Participants were asked to judge how natural the meaning of the sentence was, i.e., how likely the events depicted were to occur in the real world. Answers were recorded on a 7-point scale with 1 corresponding to 'extremely unnatural' and 7 to 'very natural.' The target sentence, but not the context sentence, remained on screen while the participant made her choice.

Thirty native speakers of American English were recruited via personal communication. All were naïve to the purpose of the experiment and did not receive compensation for their participation.

A set of fifty-six items with four conditions each was initially constructed and used in the norming study. These items were arranged in a Latin Square with four lists so that each condition of each item appeared on exactly one list. Participants were randomly assigned to one list. The order of presentation was randomized for each participant.

The results were subjected to a 2×2-factorial LME model analysis. Predictors were sum-coded (INTERVENER: $CP = -.5$, $DP = .5$; VERB TYPE: CP-$verb = -.5$; CP/DP-$verb = .5$). For the initial set of 56 items, the model revealed a lower plausibility rating in the DP condition compared to the CP condition ($p < .05$), making it clear that the experiment has the ability to detect differences in plausibility between the conditions. No other effect approached significance. To avoid a confounding of clause structure and plausibility, 48 items were selected so that the plausibility differences between the conditions was minimized. Table 1 provides the mean plausibility ratings for these 48 items. LME modeling did not detect even a hint of a plausibility difference between the DP and the CP condition within the set of these 48 items ($p > .5$). As before, no other contrast approached significance. This set of 48 items was used in the main experiment, the remaining eight were discarded. The 48 items are listed in Appendix C.

A.2 *Experiment 2*

As in Experiment 1, the semantic relations differed between the conditions in Experiment 2. To ensure that intervener type is not confounded with plausibility, a plausibility norming study was conducted. Because the semantic relations remain constant between the [+move] and

Table 1. Mean plausibility rating (and by-participant standard errors) by condition for stimuli used in Experiment 1

Intervener	Verb type	
	CP-verbs	CP/DP-verbs
CP	4.9 (.1)	4.9 (.1)
DP	4.8 (.1)	4.8 (.1)

[–move] manipulation, only the latter was included in the rating study. The experiment thus comprised a single three-level factor INTERVENER. The norming experiment hence contained three versions of each item, corresponding to (10a.ii), (10b.ii) and (10c.ii) above. All sentences were accompanied by the respective context-sentence but were not followed by a comprehension question. Participants were asked to judge how natural the meaning of the sentence was, i.e., how likely the events depicted were to occur in the real world. Answers were recorded on a 7-point scale with 1 corresponding to 'extremely unnatural' and 7 to 'very natural.' The target sentence, but not the context sentence, remained on screen while the participant made her choice.

Twenty-four native speakers of American English were recruited via Amazon Mechanical Turk. Each received USD 0.50 as compensation.

A set of thirty-six items with three conditions each was constructed. These items were arranged in a Latin Square with three lists. Each item appeared in exactly one list. Participants were randomly assigned to one list and the order of presentation of the stimuli was randomized for each participant.

To maximize comparability, the LME model used to analyze the plausibility ratings is indentical to the one used to analyze the reading time data, modulo the absence of the predictor MOVEMENT. In particular, the factor INTERVENER was Helmert coded (first contrast: CP structures versus the mean of TP and DP structures; second contrast: TP versus DP structures) to detect whether patterns in the reading time data are potentially due to plausibility confounds.

The analysis of the original set of 36 items revealed a somewhat higher plausibility of the CP condition compared to the other two, which did however not reach significance ($p > .1$) and no substantial difference between the DP and TP conditions ($t < 1$). To closely match the plausibility of the three structures across the experimental items, thirty items were extracted. The mean plausibility ratings for these thirty items by condition are provided in Table 2. In this set there was no hint of a plausibility difference (all p's $> .5$). This set of 30 sentences was then used in the self-paced reading experiment, the remaining 6 being discarded. These 30 items are listed in Appendix C.

Table 2. Mean plausibility rating (and by-participant standard errors) by condition for stimuli used in Experiment 2

Intervener		
CP	DP	TP
4.7 (.2)	4.8 (.2)	4.7 (.2)

B *Statistical analysis of non-crucial regions*

B.1 *Experiment 1*

As a measure of the response variability by condition and region, the by-participant standard errors computed over raw reading times in ms is provided in Table 3. A comprehensive overview of the coefficients obtained from the LME modeling for all regions in Experiment 1 is provided in Table 4. This appendix will discuss the results of the regions not considered in the main text.

In region 1, there is a significant interaction between *intervener* and *verb type*. This must be a type 1 error as the materials were identical in all conditions.

In region 2, there were main effects of *intervener* and *structure* such that DP conditions were read significantly slower than CP conditions and [+move] conditions slower than [−move] conditions.

In region 4, there likewise were main effects of *intervener* type and *movement*. In addition, there was a significant interaction between the two factors such that the reading time increase was greater in the DP condition than the CP condition. While the interpretation of this effect is not completely clear, it is possibly related to the hypothesis that the moved element is reactivated by the intermediate trace in the embedded Spec,CP, which the parser can postulate as soon as it encounters the complementizer. As noted above, the results here show a reading time increase due to movement that is plausibly due to the fact that an unassigned element has to be held in memory. If this element is integrated and hence re-activated when the complementizer is processed, the smaller reading time difference incurred by movement in the CP condition in region 4 can be viewed as the result of this reactivation.[1] If this interpretation is correct, it provides additional evidence for an intermediate landing site in the embedded Spec,CP.

In the final region, the [−move] conditions were read more slowly than the extraction conditions. There was furthermore a significant interaction between intervener and movement such that the reading time increase between extraction and non-extraction structures is greater for CP structures than for DP structures. Because the length of the region differed between conditions,

Table 3. By-participant standard error of raw reading times in ms by condition and region for Experiment 1

Verb type	Intervener	Movement	Region						
			1	2	3	4	5	6	7
CP	CP	[−move]	—	32	13	28	25	27	50
		[+move]	19	36	17	26	37	28	34
	DP	[−move]	—	30	14	33	25	28	41
		[+move]	22	52	22	37	37	31	30
CP/DP	CP	[−move]	—	26	11	26	21	29	46
		[+move]	21	35	20	27	41	33	35
	DP	[−move]	—	34	14	32	24	26	49
		[+move]	20	45	19	33	45	31	36

[1] This type of interaction is consistent with Gibson's (1998, 2000) length-dependent notion of storage cost, according to which the processing load incurred by holding a filler in memory grows with the distance to the filler.

Table 4. Coefficient estimates and corresponding t-value for linear mixed effects model analyses of log reading times in Experiment 1. *Mvmt:Intv* refers to the interaction between *Movement* and *Intervener*; *Mvmt:Vt* to the interaction between *Movement* and *Verb type* and *Intv:Vt* refers to the interaction between *Intervener* and *Verbtype*. *Mvmt:Intv:Vt* refers to the three-way interaction of all predictors. Cells with $p < .05$ are shaded.

Region	Movement $\hat{\beta}$	Movement t	Intervener $\hat{\beta}$	Intervener t	Verb type $\hat{\beta}$	Verb type t	Mvmt:Intv $\hat{\beta}$	Mvmt:Intv t	Mvmt:Vt $\hat{\beta}$	Mvmt:Vt t	Intv:Vt $\hat{\beta}$	Intv:Vt t	Mvmt:Intv:Vt $\hat{\beta}$	Mvmt:Intv:Vt t
1	—		−0.016	−1.53	−0.010	−0.89	—		—		−0.048	−2.31	—	
2	0.138	7.70	0.101	7.46	0.021	1.53	0.033	1.59	−0.000	−0.01	0.012	0.44	−0.062	−1.35
3	0.127	11.33	0.063	6.23	0.000	0.03	0.029	1.78	0.013	0.75	−0.024	−1.47	−0.075	−2.31
4	0.081	5.31	0.077	5.78	−0.008	−0.82	0.055	2.67	−0.014	−0.61	−0.014	−0.59	−0.034	−0.74
5	0.112	5.03	0.031	2.66	0.023	1.99	−0.004	−0.17	0.018	0.80	−0.049	−2.37	0.031	0.70
6	−0.009	−0.38	0.015	1.17	0.012	1.11	0.060	2.55	−0.026	−1.27	−0.017	−0.79	−0.018	−0.43
7	−0.350	−15.85	−0.021	−1.90	0.001	0.12	0.058	2.62	0.010	0.51	0.003	0.14	0.015	0.34

4

an additional analysis of the residual reading times was performed. This analysis replicated the effect of *movement* ($\hat{\beta} = -83, t = -4.1, p < .001$) and the interaction between movement and intervener ($\hat{\beta} = 70, t = 2.4, p < .05$). In addition, there was a main effect of *intervener* ($\hat{\beta} = -34, t = -2.3, p < .05$). This pattern of results is plausibly a wrap-up effect (see, e.g., King & Just 1991): The reading time distribution mirrors the level of embedding in the final region. In the [+move] conditions, the material in region 7 is part of the matrix clause. In the [−move] DP condition, the material in the final region is part of a relative clause and hence belongs to a first level of embedding. In the [−move] CP condition the material in this region is a relative clause inside a complement clause and thus at the second level of embedding. The reading times increase with the level of embedding in this region.[2]

Two effects are evident in a number of consecutive regions and deserve some comment. First, in regions 2 through 5, DP structures were generally read more slowly than CP structures. Because the syntactic structure in regions 2 through 4 and the lexical material in regions 2 and 3 differed between these conditions, this contrast is not surprising. That the pattern persisted into region 5 is likely either a spillover from the preceding region or an artifact of the interaction of *intervener* and *verb type* in this region. Second, that the reading times are higher in the [+move] condition than in the [−move] one throughout the length of the movement dependency mirrors the results of Experiment 1 and is plausibly due to the fact that an unassigned filler has to be held active in working memory (Wanner & Maratsos 1978, King & Kutas 1995, Gibson 1998, 2000, Fiebach et al. 2002, Grodner et al. 2002, Chen et al. 2005), under the assumption that this cost for storing the filler leaves fewer resources available for the processing of incoming material.

B.2 *Experiment 2*

The standard error of the raw reading times in ms per condition and region is given in Table 5. A comprehensive overview of the coefficients obtained from the LME modeling for all regions in Experiment 2 is provided in Table 6. This appendix will discuss the results of the regions not considered in the main text.

Most regions exhibited a main effect of *movement:* Reading times in the [+move] conditions were greater than in the [−move] conditions in regions 2 through 5 and in region 7. Region 6

Table 5. By-participant standard error of raw reading times in ms by condition and region for Experiment 2

Intervener	Movement	Region								
		1	2	3	4	5	6	7	8	9
CP	[−move]	—	31	12	22	12	14	16	30	54
	[+move]	22	39	17	28	11	15	19	29	35
DP	[−move]	—	43	11	26	11	13	15	30	52
	[+move]	23	53	18	33	13	14	16	31	38
TP	[−move]	—	29	—	28	14	16	16	28	53
	[+move]	21	43	—	29	15	14	24	27	36

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[2] A very similar pattern of results is observed by Frazier & Clifton (1989).

Table 6. Coefficient estimates and corresponding t-values for the linear mixed effects model analyses of log reading times in Experiment 2. *Mvmt* refers to the sum-coded factor *movement*; *IntervCP–TPDP* compares the CP condition to the mean of the TP and DP conditions and *IntervTP–DP* compares the TP condition to the DP condition. *Mvmt:IntCP–TPDP* and *Mvmt:IntTP–DP* refer to the interaction between *Mvmt* and *IntervCP–TPDP* and *IntervTP–DP*, respectively. Cells with $p < .05$ are shaded.

Region	Mvmt $\hat{\beta}$	Mvmt t	IntervCP-TPDP $\hat{\beta}$	IntervCP-TPDP t	IntervTP-DP $\hat{\beta}$	IntervTP-DP t	Mvmt:IntCP-TPDP $\hat{\beta}$	Mvmt:IntCP-TPDP t	Mvmt:IntTP-DP $\hat{\beta}$	Mvmt:IntTP-DP t
1	—	—	0.002	0.12	0.012	0.69	—	—	—	—
2	0.108	4.87	0.099	6.17	0.141	6.77	0.046	1.68	−0.012	−0.35
3*	0.113	7.84	0.073	4.50	—		0.034	1.18	—	
4	0.089	5.10	0.101	7.14	−0.126	−7.66	0.035	1.12	0.053	1.68
5	0.032	2.61	0.069	6.56	−0.092	−5.55	0.037	1.65	−0.030	−1.32
6	0.015	1.22	0.029	2.73	−0.037	−3.41	0.006	0.29	−0.005	−0.23
7	0.053	4.00	0.013	1.13	−0.042	−3.65	0.024	1.09	−0.049	−2.10
8	−0.039	−1.11	−0.000	−0.00	−0.003	−0.21	0.059	2.08	−0.018	−0.61
9	−0.318	−10.63	0.003	0.26	−0.007	−0.39	0.019	0.73	0.085	2.62

* Because the TP condition did not contain region 3, *IntervCP–TPDP* effectively corresponds to a direct comparison between the CP and the DP condition and *IntervTP–DP* is undefined. The same holds for their interactions with *Movement* (*Mvmt:IntCP–TPDP* and *Mvmt:IntTP–DP*), respectively. Contrasts were redefined accordingly for that region. See the main text for details.

6

followed the same trend but without reaching significance. In the final region, reading times were significantly lower in the [+move] conditions than the [−move] conditions.

In region 2, reading times in the CP condition were reliably smaller than the mean of the DP and TP conditions and reading times in the DP conditions were significantly higher than in the TP condition. A post-hoc pairwise comparisons of the means showed that the DP condition had signficantly higher reading times than the CP condition ($t_1(100) = 10, p < .001$; $t_2(28) = 7, p < .001$) and the TP condition ($t_1(100) = 8, p < .001$; $t_2(28) = 6, p < .001$) while the latter two did not differ ($t_1(100) = 1.63, p > .1$; $t_2(28) = 1.93, p = .06$). This pattern is unsurprising given that the lexical material in the DP condition differed from the other two in this region.

Because region 3 did not contain any material in the TP condition, the CP and DP condition were compared directly (see the discussion in the main text). The DP condition elicited greater reading times than the CP condition. This is again unsurprising as the lexical content and the preceding region differed between the two structures. Analysis of the residual reading times indicated a parallel effect of *movement* ($\hat{\beta} = 81, t = 8, p < .001$) but no main effect of *intervener* nor an interaction (p's $> .1$).

In region 4, reading times in the CP condition were smaller than in the combination of the other two. At the same time, reading times in the DP condition were faster than in the TP condition. Post-hoc pairwise comparisons revealed that this pattern was produced by faster reading times in the CP condition compared to the DP condition ($t_1(100) = 1.94, p = .06$; $t_2(28) = 2.71, p < .011$). In addition, the CP condition was read faster than the TP condition ($t_1(100) = 9, p < .001$; $t_2(28) = 9, p < .001$). These differences are not interpretable because the lexical content of the preceding region as well as the syntactic context of that region differed between the three structures.

In region 5, the model analysis produced a pattern similar to region 4. Pairwise comparisons showed that the CP condition was read faster than the DP condition ($t_1(100) = 1.94, p = .055$; $t_2(28) = 2.14, p < .05$) and the TP condition ($t_1(100) = 10, p < .001$; $t_2(28) = 8, p < .001$). Analysis of the residual reading times indicated only a main effect of *movement* ($\hat{\beta} = 18, t = 2.5, p < .05$; all other p's $> .1$). This pattern is plausibly related to the design of the experiment. For the majority of items, region 5 was longer in the TP condition (*to have* vs. *had*). The increased reading in the DP condition are likely due to the fact that the element that had to be construed in the subject position is of considerably greater syntactic and semantic complexity in the DP condition than the CP condition.

In region 6, reading times in the CP condition were faster than the mean of the other two. Additionally, reading times in the TP conditions were higher than in the DP condition. Pairwise comparisons indicated that this pattern was produced by particularly high reading times in the TP condition: The reading times in the TP condition were higher than in the CP condition ($t_1(100) = 3.7, p < .001$; $t_2(28) = 3.0, p < .01$) and there was no difference between the CP and the DP conditions ($t_1(100) = .9, p = .4$; $t_2(28) = .7, p > .5$). This pattern is plausibly a result of the fact that the lexical content in the preceding region differed between the TP and the other two conditions.

Finally, region 9 exhibited significantly greater reading times in the [−move] conditions than the [+move] ones and an interaction such that this reading times increase was significantly greater in the TP condition than the DP condition. In the analysis of the residual reading times, both

effects are marginally significant (.05 < p < .1). This effects mirrors the pattern in Experiment 1 and like the latter is likely a wrap-up effect reflecting the differing depths of clausal embedding of the material in the final region: Not only is the final region longer in the [–move] condition than in the [+move] condition, this regions is also part of a matrix clause in the latter but inside an embedded clause in the former. Furthermore, the region is embedded within an embedded clause in the CP and TP region. This accounts for the particularly high reading time increase in the CP and TP conditions compared to the DP conditions.

C Materials used

C.1 Experiment 1
This appendix provides the materials in the extraction conditions of each item in both the CP and the DP condition (a. and b., respectively). The verb type manipulation is given between curly brackets. The first verb/noun shown falls into the CP/DP-class, the second one into the CP-class. The non-extraction conditions can be constructed by moving the clause-initial noun phrase and the relative pronoun (e.g., *the manager who* in item 1) immediately after the end of the relative clause (e.g., between *pleased* and *will hire* in item 1). The first sentence of each item constitutes the context sentence for that item. The question following the actual target sentences in a. and b are the comprehension questions. Possible answers are given in italics. The order of presentation of these answers was randomized for each subject.

1. People tend to make favorable decisions when they are pleased by something.
    a. The manager who the consultant {claimed / hinted} that the new proposal had pleased will hire five workers tomorrow.
    b. The manager who the consultant's {claim / hint} about the new proposal had pleased will hire five workers tomorrow.

    Who was (allegedly) pleased?
    the manager – the consultant

2. At the rehearsal some felt distressed.
    a. The actress who the agent {implied / remarked} that the controversial rumor had distressed lobbied to play Evita.
    b. The actress who the agent's {implications / remark} about the controversial rumor had distressed lobbied to play Evita.

    Who felt distressed?   *the actress – the agent*

3. Thrilling experiences are the spice of life.
    a. The woman who the man {confirmed / dreamed} that the recent events had thrilled was hoping to get married.
    b. The woman who the man's {confirmation of /

dream about} the recent events had thrilled was hoping to get married.

Who was thrilled?   *the woman – the man*

4. Sometimes people are embarrassed by what others have to say.
    a. The freshman who the sophomore {implied / insisted} that the late night confession had embarrassed was new to the partying scene.
    b. The freshman who the sophomore's {implication / insistence} about the late night confession had embarrassed was new to the partying scene.

    Who was the embarrassed one?
    the freshman – the sophomore

5. Some things are really annoying.
    a. The victim who the counselor {concluded / agreed} that the mean-spirited comment had annoyed has switched to another psychoanalyst.
    b. The victim who the counselor's {conclusion about / agreement with} the mean-spirited comment had annoyed has switched to another psychoanalyst.

    Who was annoyed?   *the victim – the counselor*

6. Reassuring someone who is in a difficult situation in life is often of utmost importance.

a. The patient who the doctor {predicted / hoped} that the test results will reassure had been afraid she had cancer.

b. The patient who the doctor's {prediction / hope} about the test results will reassure had been afraid she had cancer.

Who will be reassured?   *the patient – the doctor*

7. People generally do not deal well with being embarrassed.

a. The judge who the reporter {implied / speculated} that the controversial decision had embarrassed has decided to sue the paper.

b. The judge who the reporter's {implication / speculation} about the controversial decision had embarrassed has decided to sue the paper.

Who was embarrassed?   *the judge – the reporter*

8. To produce a masterpiece artists need to be inspired by something.

a. The author who the secret lover {declared / insisted} that his love had inspired unexpectedly won the Nobel Prize.

b. The author who the secret lover's {declaration / insistence} of his love had inspired unexpectedly won the Nobel Prize.

Who was inspired?   *the author – the lover*

9. (*The regioning in this item was incorrect and it was discarded from all analyses*)
In the trial yesterday someone got implicated in the crime.

a. The defendant who the witness {confirmed / agreed} that the convincing testimony had implicated admitted the truth.

b. The defendant who the witness's {confirmation of / agreement with} the convincing testimony had implicated admitted the truth.

Who was it that got implicated in the crime?
        the defendant – the witness

10. At the hearing last month some participant supposedly got disconcerted.

a. The senator who the committee {stated / insisted} that the charges had disconcerted will nonetheless remain on the ethics panel.

b. The senator who the committee's {statement of / insistence on} the charges had disconcerted will nonetheless remain on the ethics panel.

Who was it that got disconcerted?
        the senator – the committee

11. Occasionally comfort in rough times comes from unexpected places.

a. The daughter who the guidance counselor {predicted / thought} that the court decision will comfort has left home for good.

b. The daughter who the guidance counselor's {prediction / thoughts} about the court decision will comfort has left home for good.

Who {might / will} receive some comfort?
        the daughter – the guidance counselor

12. Working in politics can be bothersome.

a. The politician who the journalist {predicted / pretended} that the government announcement will bother is calling a press conference.

b. The politician who the journalist's {prediction / pretense} about the government announcement will bother is calling a press conference.

Who did the {announcement / prediction / pretense} bother?   *the politician – the journalist*

13. Young people are easy to frighten.

a. The girl who the teacher {concluded / remarked} that the nasty threat had frightened has stopped going to school.

b. The girl who the teacher's {conclusions / remark} about the nasty threat had frightened has stopped going to school.

Who got frightened by {(the conclusion / remark about) the threat}?   *the girl – the teacher*

14. Many things in life can be upsetting.

a. The orphan who the social worker {decided / thought} that the problem had upset was unhappy with her foster parents.

b. The orphan who the social worker's {decision / thoughts} about the problem had upset was unhappy with her foster parents.

Who was upset by something?
        the orphan – the social worker

15. The court hearing the other day seems to have shocked many people.

a. The witness who the lawyer {proved / pretended} that the crime had shocked does not want to testify.

b. The witness who the lawyer's {proof / pretense} about the crime had shocked does not want to testify.

Who did the {crime / proof / pretense} shock?
        the witness – the lawyer

16. People inspired by something tend to choose artistic professions.

   a. The actress who the journalist {guessed / hoped} that the talented writer had inspired will go on stage tonight.

   b. The actress who the journalist's {guess about / hopes for} the talented writer had inspired will go on stage tonight.

   Who was inspired?   *the actress – the journalist*

17. It is important to be vocal if one feels distressed.

   a. The schoolboy who the teacher {proved / theorized} that the bully's aggression had distressed will complain at the meeting.

   b. The schoolboy who the teacher's {proof of / theory about} the bully's aggression had distressed will complain at the meeting.

   Who was feeling distressed?

   the schoolboy – the teacher

18. Many people pursue grad school because they are fascinated by their subject.

   a. The student who the professor {concluded / thought} that the Ancient Greek had fascinated is planning to go on an archaeological excursion.

   b. The student who the professor's {conclusions / thoughts} about the Ancient Greek had fascinated is planning to go on an archaeological excursion.

   Who was fascinated?   *the student – the professor*

19. Getting inspired by something sometimes leads to new discoveries.

   a. The student who the teacher {predicted / boasted} that the new idea will inspire is studying artificial intelligence.

   b. The student who the teacher's {prediction / boast} about the new idea will inspire is studying artificial intelligence.

   Who was inspired?   *the student – the teacher*

20. If one is bothered by an aspect of one's life it is a good idea to look for alternatives.

   a. The chef who the cook {assumed / speculated} that the head waitress had bothered wants to find another job.

   b. The chef who the cook's {assumption / speculation} about the head waitress had bothered wants to find another job.

Who did {the head waitress / the assumption about the head waitress / the speculation about the head waitress} bother?   *the chef – the cook*

21. Every so often even grumpy people are delighted by something.

   a. The CEO who the secretary {claimed / insisted} that the new project had delighted is normally very hard to please.

   b. The CEO who the secretary's {claim / insistence} about the new project had delighted is normally very hard to please.

Who was delighted?   *the CEO – the secretary*

22. Some people act irresponsibly when they get annoyed.

   a. The customer who the receptionist {implied / remarked} that the lazy cleaner had annoyed will not pay his bill.

   b. The customer who the receptionist's {implications / remark} about the lazy cleaner had annoyed will not pay his bill.

Who got annoyed by something?

   the customer – the receptionist

23. Making someone feel alarmed by something can often sell products.

   a. The man who the detective {concluded / remarked} that the dangerous thief had alarmed will buy a new alarm.

   b. The man who the detective's {conclusion / remark} about the dangerous thief had alarmed will buy a new alarm.

Who was alarmed?   *the man – the detective*

24. It's advisable not to anger a person you are working for.

   a. The tourist who the tour guide {claimed / thought} that the hotel manager had angered wants to return home now.

   b. The tourist who the tour guide's {claim / thoughts} about the hotel manager had angered wants to return home now.

Who was (allegedly) angered by something?

   the tourist – the tour guide

25. At the annual convention some attendees allegedly were infuriated.

   a. The activists who the reporter {asserted / remarked} that human-rights violations had infuriated wrote a strong letter of complaint.

b. The activists who the reporter's {assertion / remark} about human-rights violations had infuriated wrote a strong letter of complaint.

Who got infuriated at the convention?

the activists – the reporter

26. Some people work relentlessly if they are fascinated by something.

    a. The therapist who the patient {assumed / dreamed} that the strange woman had fascinated is writing a new book.

    b. The therapist who the patient's {assumption / dream} about the strange woman had fascinated is writing a new book.

    Who is fascinated by something?

    the therapist – the patient

27. Even appalling events in one's life can teach one a lesson.

    a. A lot of people who the veteran {recalled / hoped} that the war had appalled told their sons not to join the Navy.

    b. A lot of people who the veteran's {recollections / hope} about the war had appalled told their sons not to join the Navy.

    Who was appalled?   *a lot of people – the veteran*

28. Being agitated by some problem can be very motivational.

    a. Many engineers who the scientist {demonstrated / hypothesized} that the effects of global warming agitated invented greener technologies.

    b. Many engineers who the scientist's {demonstration of / hypothesis about} the effects of global warming agitated invented greener technologies.

    Who was agitated and used it for a good cause?

    the engineers – the scientist

29. There are people who are very sensitive and easy to displease.

    a. The heiress who the lawyer {confirmed / insisted} that the recently proposed plan had displeased will attend an important meeting this afternoon.

    b. The heiress who the lawyer's {confirmation of / insistence on} the recently proposed plan had displeased will attend an important meeting this afternoon.

    Who did {the plan / the confirmation / the insistence} displease?   *the heiress – the lawyer*

30. I have been informed that some person was unsettled by what happened in court yesterday.

    a. The lawyer who the spectator {recalled / boasted} that the incident had unsettled made his own declaration.

    b. The lawyer who the spectator's {recollection of / boast about} the incident had unsettled made his own declaration.

    Who was unsettled in court yesterday?

    the lawyer – the spectator

31. Because many political situations are complicated different sources often contradict each other.

    a. The journalist who the editor {decided / argued} that the new report had contradicted was planning a series of articles.

    b. The journalist who the editor's {decision / argument} about the new report had contradicted was planning a series of articles.

    Who did {the report / the decision / the argument} contradict?   *the journalist – the editor*

32. I heard that a visitor at the art gallery had gotten emotionally affected.

    a. The grumpy old man who the guide {recalled / speculated} that the painting had deeply affected turned out to be a wealthy collector.

    b. The grumpy old man who the guide's {recollections / speculations} about the painting had deeply affected turned out to be a wealthy collector.

    Who was it that got emotionally affected?

    the old man – the guide

33. From time to time people who are angered do irresponsible things.

    a. The general who the sergeant {assumed / thought} that the message had angered complained to the lieutenant.

    b. The general who the sergeant's {assumption / thoughts} about the message had angered complained to the lieutenant.

    Who did the general complain to?

    the lieutenant – the sergeant

34. Groundless allegations really could hurt people in our company.

    a. The secretary who the lawyer {claimed / boasted} that the accusation had hurt was fired from her job.

b. The secretary who the lawyer's {claim / boast} about the accusation had hurt was fired from her job.

Who made a {claim / boast}?

the lawyer – the secretary

35. At the movie set the other day someone had the blues and needed to be cheered up.

a. The make-up artist who the producer {claimed / commented} that the hair stylist had cheered up was enthusiastic to get to work again.

b. The make-up artist who the producer's {claim / comment} about the hair stylist had cheered up was enthusiastic to get to work again.

Who made a {claim / comment}?

the producer – the hair stylist

36. In some cases conclusions which are supposed to be impartial are actually unfairly influenced.

a. The committee members who the professor {assumed / speculated} that the dean's recommendation had influenced finally reached a decision.

b. The committee members who the professor's {assumption / speculation} about the dean's recommendation had influenced finally reached a decision.

Who made a recommendation?

the dean – the professor

37. It frequently happens that people who are angered won't cooperate.

a. The nurse who the doctor {assumed / agreed} that the new patient had angered is refusing to work late.

b. The nurse who the doctor's {assumptions about / agreement with} the new patient had angered is refusing to work late.

Who was new to the hospital?

the patient – the nurse

38. At the convention last Thursday someone who got startled made a surprising decision.

a. The farmer who the builder {implied / thought} that the dedicated worker had startled will give everybody extra money.

b. The farmer who the builder's {implication / thoughts} about the dedicated worker had startled will give everybody extra money.

Who is dedicated?

the worker – the builder

39. Yesterday someone got offended and a drama happened.

a. The singer who the musician {asserted / hinted} that the drunken guitarist had offended will not perform this evening.

b. The singer who the musician's {assertion / hint} about the drunken guitarist had offended will not perform this evening.

Who asserted something?

the musician – the guitarist

40. Annoying someone can have drastic consequences.

a. The coach who the manager {decided / remarked} that the violent boxer had annoyed will cancel the match today.

b. The coach who the manager's {decision / remark} about the violent boxer had annoyed will cancel the match today.

Who made a {decision / remark}?

the manager – the boxer

41. Embarrassing someone is rarely a good idea.

a. The film star who the interviewer {implied / hinted} that the horrible photographer had embarrassed will not answer any questions.

b. The film star who the interviewer's {implication / hint} about the horrible photographer had embarrassed will not answer any questions.

Who {implied / hinted at} something?

the interviewer – the photographer

42. In the headquarters there was a dispute this morning that displeased various workers.

a. The captain who the officer {decided / agreed} that the young soldier had displeased will write a formal report.

b. The captain who the officer's {decision about / agreement with} the young soldier had displeased will write a formal report.

Which person is young?   *the soldier – the officer*

43. Recent advancements in science could help many patients.

a. The schizophrenic who the psychologist {concluded / hypothesized} that the new theory could help has stopped taking his pills.

b. The schizophrenic who the psychologist's {conclusion / hypothesis} about the new theory could help has stopped taking his pills.

Who {drew a conclusion / made a hypothesis}?

the psychologist – the schizophrenic

44. Running for office can be disturbing.

   a. The candidate who the senator {proved / speculated} that the allegations had disturbed might retract his candidacy.

   b. The candidate who the senator's {proof of / speculation about} the allegations had disturbed might retract his candidacy.

   Who {proved / speculated about} something?

   the senator – the candidate

45. Even if you are properly prepared certain things you learn in school can be confusing.

   a. The smart student who the teacher {illustrated / remarked} that the problem had confused did very poorly on the exam.

   b. The smart student who the teacher's {illustration of / remark about} the problem had confused did very poorly on the exam.

   Who is smart? *the student – the teacher*

46. Magic sure is impressive.

   a. The magician who the apprentice {guessed / boasted} that the spell had impressed suddenly vanished from the stage.

   b. The magician who the apprentice's {guess / boast} about the spell had impressed suddenly vanished from the stage.

   Who made a {guess / boast}?

   the apprentice – the magician

47. Owning property can be disconcerting.

   a. The wary landlord who the tenant {stated / commented} that the burglary has disconcerted is planning to have an alarm installed.

   b. The wary landlord who the tenant's {statement / comment} about the burglary has disconcerted is planning to have an alarm installed.

   Who is wary? *the landlord – the tenant*

48. Having an idol can be thrilling indeed.

   a. The fan who the rock star {confirmed / commented} that the rumors had thrilled immediately told his crazy uncle about it.

   b. The fan who the rock star's {confirmation of / comment about} the rumors had thrilled immediately told his crazy uncle about it.

   Who is crazy? *the uncle – the rock star*

C.2 *Experiment 2*

This appendix provides the materials in the extraction conditions of each item in the CP, TP and DP conditions (a., b. and c., respectively). The non-extraction conditions can be constructed analoguously to Experiment 1. The first sentence of each item constitutes the context sentence for that item. The question following the actual target sentences in a., b. and c. are the comprehension questions. Possible answers are given in italics. The order of presentation of these answers was randomized for each subject.

1. Thrilling experiences are the spice of life.

   a. The actress who the agent believed that the recent events had secretly thrilled lobbied to play Evita.

   b. The actress who the agent believed the recent events to have secretly thrilled lobbied to play Evita.

   c. The actress who the agent's belief about the recent events had secretly thrilled lobbied to play Evita.

   Who was thrilled? *the actress – the agent*

2. In the trial today someone surprising was incriminated.

   a. The witness who the prosecutor proved that the bloody footprint had conclusively incriminated admitted the truth.

   b. The witness who the prosecutor proved the bloody footprint to have conclusively incriminated admitted the truth.

   c. The witness who the prosecutor's proof about the bloody footprint had conclusively incriminated admitted the truth.

   Who had been incriminated?

   the witness – the prosecutor

3. It is important to be vocal if one feels distressed.

   a. The schoolboy who the teacher believes that the bully's aggression had obviously distressed will complain at the meeting.

   b. The schoolboy who the teacher believes the bully's aggression to have obviously distressed will complain at the meeting.

c. The schoolboy who the teacher's belief about the bully's aggression had obviously distressed will complain at the meeting.

Who got distressed by the belief about the aggression?
the schoolboy – the teacher

4. Many things you have to learn in college are very boring.

   a. The student who the professor proved that the Ancient Greeks had terribly bored is forced to go on an archaeological excursion.

   b. The student who the professor proved the Ancient Greeks to have terribly bored is forced to go on an archaeological excursion.

   c. The student who the professor's proof about the Ancient Greeks had terribly bored is forced to go on an archaeological excursion.

   Who was really bored by the proof?
the student – the professor

5. Being agitated by some problem can be very motivational.

   a. Many engineers who the scientist believed that global warming had seriously agitated invented greener technologies.

   b. Many engineers who the scientist believed global warming to have seriously agitated invented greener technologies.

   c. Many engineers who the scientist's beliefs about global warming had seriously agitated invented greener technologies.

   Who was agitated by something?
the engineers – the scientist

6. I have been informed that some person was unsettled by what happened in court yesterday.

   a. The spectator who the detective proved that the incident had noticeably unsettled decided to make his own declaration.

   b. The spectator who the detective proved the incident to have noticeably unsettled decided to make his own declaration.

   c. The spectator who the detective's proof about the incident had noticeably unsettled decided to make his own declaration.

   Who did the proof unsettle?
the spectator – the detective

7. Everyday things can be astonishing to some people.

   a. The woman who the man expected that the park will totally astonish had to tell her friends about it.

   b. The woman who the man expected the park to totally astonish had to tell her friends about it.

   c. The woman who the man's expectations about the park will totally astonish had to tell her friends about it.

   Who might the expectations about the park astonish?
the woman – the man

8. (*This item was coded incorrectly and eliminated from all analyses.*)
   Even appalling events in one's life can teach one a lesson.

   a. A lot of people who the veteran suspects that the war had completely appalled told their sons not to join the Navy.

   b. A lot of people who the veteran suspects the war to have completely appalled told their sons not to join the Navy.

   c. A lot of people who the veteran's suspicion about the war had completely appalled told their sons not to join the Navy.

   Who felt appalled?   *a lot of people – the veteran*

9. Providing help for individuals in need should be an objective for politicians.

   a. Countless families who the government proved that the new legislation had profoundly helped would have gone bankrupt otherwise.

   b. Countless families who the government proved the new legislation to have profoundly helped would have gone bankrupt otherwise.

   c. Countless families who the government's proof about the new legislation had profoundly helped would have gone bankrupt otherwise.

   Who was helped by the proof?
many families – the government

10. Being aggravated by a problem can make people persistent.

   a. The political candidate who the inspector revealed that the Senate had immensely aggravated is lacking rich donors to back him up.

   b. The political candidate who the inspector revealed the Senate to have immensely aggravated is lacking rich donors to back him up.

   c. The political candidate who the inspector's revelations about the Senate had immensely aggravated is lacking rich donors to back him up.

Who was aggravated?

the candidate – the inspector

11. People caught up in the recent political affair were greatly disconcerted by it.

   a. The senator who the political consultant suspected that the charges had greatly disconcerted will nonetheless remain on the panel.

   b. The senator who the political consultant suspected the charges to have greatly disconcerted will nonetheless remain on the panel.

   c. The senator who the political consultant's suspicions about the charges had greatly disconcerted will nonetheless remain on the panel.

   Who was disconcerted?

the senator – the consultant

12. There are people who are very sensitive and easy to displease.

   a. The heiress who the lawyer believed that the recently proposed plan had noticeably displeased will attend an important meeting this afternoon.

   b. The heiress who the lawyer believed the recently proposed plan to have noticeably displeased will attend an important meeting this afternoon.

   c. The heiress who the lawyer's beliefs about the recently proposed plan had noticeably displeased will attend an important meeting this afternoon.

   Who was it that was displeased?

the heiress – the lawyer

13. At the meeting last week everyone had to say what they were currently interested in.

   a. The newswriter who the legal correspondent discovered that the trial had greatly interested is having serious doubts about the verdict.

   b. The newswriter who the legal correspondent discovered the trial to have greatly interested is having serious doubts about the verdict.

   c. The newswriter who the legal correspondent's discovery about the trial had greatly interested is having serious doubts about the verdict.

   Who was interested by the discovery?

the newswriter – the correspondent

14. Excessive drinking can lead to worrisome results.

   a. The freshman who the sophomore suspected that the scandalous party had needlessly worried was absent from class this morning.

   b. The freshman who the sophomore suspected the scandalous party to have needlessly worried was absent from class this morning.

   c. The freshman who the sophomore's suspicion about the scandalous party had needlessly worried was absent from class this morning.

   Who was it that was needlessly worried?

the freshman – the sophomore

15. I heard that a visitor at the garden exhibition was delighted.

   a. The elderly man who the guide believed that the beautiful flower had immensely delighted turned out to be a wealthy collector.

   b. The elderly man who the guide believed the beautiful flower to have immensely delighted turned out to be a wealthy collector.

   c. The elderly man who the guide's beliefs about the beautiful flower had immensely delighted turned out to be a wealthy collector.

   Who was it that felt delighted?

the elderly – the guide

16. In some parts of the world the weather is often a cause for concern.

   a. The teacher who the little boy expected that the sky will seriously concern is planning to leave as soon as possible.

   b. The teacher who the little boy expected the sky to seriously concern is planning to leave as soon as possible.

   c. The teacher who the little boy's expectation about the sky will seriously concern is planning to leave as soon as possible.

   Who did the expectation about the sky concern?

the teacher – the boy

17. Some people are quite easy to impress.

   a. The girl who the teacher expected that the old building will thoroughly impress is telling all her friends about it.

   b. The girl who the teacher expected the old building to thoroughly impress is telling all her friends about it.

   c. The girl who the teacher's expectation about the old building will thoroughly impress is telling all her friends about it.

   Who will be impressed?   *the girl – the teacher*

18. Trying to change things that infuriate you can be a driving force in one's work.

a. The author who the agent revealed that the media had frequently infuriated is writing a new book.

b. The author who the agent revealed the media to have frequently infuriated is writing a new book.

c. The author who the agent's revelations about the media had frequently infuriated is writing a new book.

Who got infuriated? *the author – the agent*

19. Sometimes even very simple things can be pleasing.

a. The boy who the mother expected that the weather will easily please can't wait to go outside.

b. The boy who the mother expected the weather to easily please can't wait to go outside.

c. The boy who the mother's expectation about the weather will easily please can't wait to go outside.

Who expected something? *the mother – the boy*

20. Taking courses outside of one's field of study can be overwhelming.

a. The undergrad who the math professor suspected that the problem had really overwhelmed has already given up on that class.

b. The undergrad who the math professor suspected the problem to have really overwhelmed has already given up on that class.

c. The undergrad who the math professor's suspicion about the problem had really overwhelmed has already given up on that class.

Who had a suspicion about something? *the professor – the undergrad*

21. If you are famous, reporters often will want to embarrass you with shady affairs.

a. The movie star who the spokesperson revealed that social media had thoroughly embarrassed is strangely enough not going to sue.

b. The movie star who the spokesperson revealed social media to have thoroughly embarrassed is strangely enough not going to sue.

c. The movie star who the spokesperson's revelation about social media had thoroughly embarrassed is strangely enough not going to sue.

Who revealed something? *the spokesperson – the movie star*

22. At the family reunion last month someone seemed distressed.

a. The aunt who the girl suspected that the controversial rumor had seriously distressed was hoping to get married.

b. The aunt who the girl suspected the controversial rumor to have seriously distressed was hoping to get married.

c. The aunt who the girl's suspicion about the controversial rumor had seriously distressed was hoping to get married.

Who suspected something regarding the rumor? *the girl – the aunt*

23. Alarming news arrived today.

a. The daughter who the guidance counselor suspected that the court decision had probably alarmed might leave home for good.

b. The daughter who the guidance counselor suspected the court decision to have probably alarmed might leave home for good.

c. The daughter who the guidance counselor's suspicion about the court decision had probably alarmed might leave home for good.

Who suspected something? *the guidance counselor – the daughter*

24. At the press conference last Monday several people became very agitated.

a. The journalist who the union member believed that the tax policy had intensely agitated was planning a series of articles.

b. The journalist who the union member believed the tax policy to have intensely agitated was planning a series of articles.

c. The journalist who the union member's beliefs about the tax policy had intensely agitated was planning a series of articles.

Who believed something regarding the tax policy? *the union member – the journalist*

25. Some employees at this hospital are very sensitive and easy to offend.

a. The nurse who the doctor believed that the admitted patient had gravely offended is well-known for not getting along with people.

b. The nurse who the doctor believed the admitted patient to have gravely offended is well-known for not getting along with people.

c. The nurse who the doctor's beliefs about the admitted patient had gravely offended is well-known for not getting along with people.

Who believed something about the patient? *the doctor – the nurse*

26. At the recent hearing, everyone looks calm and composed.
    a. The minister who the attorney believed that the charges had curiously calmed down is secluding himself from the public.
    b. The minister who the attorney believed the charges to have curiously calmed down is secluding himself from the public.
    c. The minister who the attorney's beliefs about the charges had curiously calmed down is secluding himself from the public.

    Who had a belief about the charges?

    the attorney – the minister

27. Many students pursue grad school because they are fascinated by something.
    a. The history major who the professor discovered that the Middle Ages had deeply fascinated is especially interested in the crusades.
    b. The history major who the professor discovered the Middle Ages to have deeply fascinated is especially interested in the crusades.
    c. The history major who the professor's discoveries about the Middle Ages had deeply fascinated is especially interested in the crusades.

    Who had discovered something?

    the professor – the history major

28. Foreign places can make for an unsettling experience.
    a. The tourists who the local zealot expected that the ruins had deeply unsettled were looking for an adventure.
    b. The tourists who the local zealot expected the ruins to have deeply unsettled were looking for an adventure.
    c. The tourists who the local zealot's expectations about the ruins had deeply unsettled were looking for an adventure.

    Who expected something?

    the zealot – the tourists

29. Children can be intrigued by very simple things.
    a. The girl who the uncle expects that the puzzle will endlessly intrigue does not like to play outside.
    b. The girl who the uncle expects the puzzle to endlessly intrigue does not like to play outside.
    c. The girl who the uncle's expectation about the puzzle will endlessly intrigue does not like to play outside.

    Who expects something?   *the uncle – the girl*

30. The work in a lab is full of surprises.
    a. The lab technician who the researcher proved that the new supercomputer had genuinely surprised is working late again.
    b. The lab technician who the researcher proved the supercomputer to have genuinely surprised is working late again.
    c. The lab technician who the researcher's proof about the supercomputer had genuinely surprised is working late again.

    Who proved something?

    the researcher – the lab technician