**Supplementary materials**

**Supplementary materials A: Experimental materials**

Sentences and comprehension questions used in the study. “\_” indicated which words were presented in one frame.

*Wh-conditions*

*“what” version is in a; “whether” version is in b.*

1a. The\_nurse asked what the\_doctor prescribed the\_medicine for after the\_patient\_left.

Did the nurse ask about the prescription? Y

1b. The\_nurse asked whether the\_doctor prescribed the\_medicine for the flu after the\_patient\_left.

Did the nurse ask about the prescription? Y

2a. The\_student wondered what the\_professor created the\_assignment for at the\_end\_of\_the\_year.

2b. The\_student wondered whether the\_professor created the\_assignment for the course at the\_end\_of\_the\_year.

3a. The\_writer wanted\_to\_know what the\_publisher approved the\_article for after the\_meeting.

Did the writer approve the article? N

3b.The\_writer wanted\_to\_know whether the\_publisher approved the\_article for the journal after the\_meeting.

Did the writer approve the article? N

4a. The\_reporter asked what the\_player caught the\_ball with to block\_the\_shot.

Did the player drop the ball? N

4b. The\_reporter asked whether the\_player caught the\_ball with his hands to block\_the\_shot.

Did the player drop the ball? N

5a. The\_guard asked what the\_thief broke the\_glass with to get\_into\_the\_museum.

Did the thief break the glass? Y

5b. The\_guard asked whether the\_thief broke the\_glass with a brick to get\_into\_the\_museum.

Did the thief break the glass? Y

6a. The\_guide wondered what the\_tourist recognized the\_street from during the\_bus\_tour.

Did the tourist take a bus tour? Y

6b. The\_guide wondered whether the\_tourist recognized the\_street from the magazine during the\_bus\_tour.

Did the tourist take a bus tour? Y

7a. The\_builder wondered what the\_worker repaired the\_leak with before going\_home.

Did the worker repair the leak? Y

7b. The\_builder wondered whether the\_worker repaired the\_leak with some tape before going\_home.

Did the worker repair the leak? Y

8a. The\_biker wanted\_to\_know what the\_worker blocked the\_road for during the\_day.

8b. The\_biker wanted\_to\_know whether the\_worker blocked the\_road for the construction during the\_day.

9a. The\_supervisor wondered what the\_employee reached the\_shelf with to get\_to\_some\_boxes.

Did the supervisor reach the shelf? N

9b. The\_supervisor wondered whether the\_employee reached the\_shelf with a ladder to get\_to\_some\_boxes.

Did the supervisor reach the shelf? N

10a. The\_operator asked what the\_caller requested the\_ambulance for on the\_college\_campus.

10b. The\_operator asked whether the\_caller requested the\_ambulance for the accident on the\_college\_campus.

11a. The\_employer asked what the\_company produced the\_parts for because nobody\_could\_say.

11b. The\_employer asked whether the\_company produced the\_parts for the machine because nobody\_could\_say.

12a. The\_man wondered what the\_firefighter saved the\_documents from when the\_alarm\_sounded.

Did the firefighter save the man? N

12b. The\_man wondered whether the\_firefighter saved the\_documents from the fire when the\_alarm\_sounded.

Did the firefighter save the man? N

13a. The\_colleague wanted\_to\_know what the\_scientist invented the\_procedure for after the\_presentation.

Did the colleague invent the procedure? N

13b.The\_colleague wanted\_to\_know whether the\_scientist invented the\_procedure for the analysis after the\_presentation.

Did the colleague invent the procedure? N

14a. The\_director asked what the\_worker unlocked the\_door with that Monday\_morning.

Did the director unlock the door? N

14b. The\_director asked whether the\_worker unlocked the\_door with the key that Monday\_morning.

Did the director unlock the door? N

15a. The\_parent wanted\_to\_know what the\_child watched the\_movie about on TV\_last\_night.

Did the child watch a movie? Y

15b. The\_parent wanted\_to\_know what the\_child watched the\_movie about on TV\_last\_night.

Did the child watch a movie? Y

16a. The\_woman wondered what the\_maid washed the\_shirt with to get\_rid\_of\_the\_stains.

Did the woman wash the rug? N

16b. The\_woman wondered whether the\_maid washed the\_shirt with some soap to get\_rid\_of\_the\_stains.

Did the woman wash the rug? N

17a. The\_scientist asked what the\_assistant analyzed the\_data for in the\_lab.

17b. The\_scientist asked whether the\_assistant analyzed the\_data for the experiment in the\_lab.

18a. The\_assistant wondered what the\_host cancelled the\_event for after the\_call.

18b. The\_assistant wondered whether the\_host cancelled the\_event for the company after the\_call.

19a. The\_manager asked what the\_musician carried the\_guitar in on the\_tour.

Did the musician bring the guitar? Y

19b. The\_manager asked whether the\_musician carried the\_guitar in the case on the\_tour.

Did the musician bring the guitar? Y

20a. The\_customer wanted\_to\_know what the\_banker checked the\_account for after the\_call.

20b.The\_customer wanted\_to\_know whether the\_banker checked the\_account for a problem after the\_call.

21a. The\_director wondered what the\_assistant controlled the\_lights with during the\_play.

21b. The\_director wondered whether the\_assistant controlled the\_lights with a switch during the\_play.

22a. The\_neighbor asked what the\_boy crossed the\_street for in spite\_of\_the\_traffic.

Did the neighbor cross the street? N

22b. The\_neighbor asked whether the\_boy crossed the\_street for his dog in spite\_of\_the\_traffic.

Did the neighbor cross the street? N

23a. The\_nanny wondered what the\_boy destroyed the\_toy with while he\_was\_playing.

Did the nanny destroy the toy? N

23b. The\_nanny wondered whether the\_boy destroyed the\_toy with his hands while he\_was\_playing.

Did the nanny destroy the toy? N

24a. The\_guest wanted\_to\_know what the\_waiter lit the\_candle with for the\_diners.

Did the waiter light the candle? Y

24b.The\_guest wanted\_to\_know whether the\_waiter lit the\_candle with a match for the\_diners.

Did the waiter light the candle? Y

25a. The\_customer wondered what the\_jeweler needed the\_metal for to sell\_in\_the\_store.

Did the jeweler need the metal? Y

25b. The\_customer wondered whether the\_jeweler needed the\_metal for the ring to sell\_in\_the\_store.

Did the jeweler need the metal? Y

26a. The\_buyer asked what the\_artist painted the\_wall with at the\_event.

26b. The\_buyer asked whether the\_artist painted the\_wall with a brush at the\_event.

27a. The\_boy wondered what the\_teacher solved the\_problem with when it\_was\_discussed\_in\_class.

Did the boy solve the problem? N

27b. The\_boy wondered whether the\_teacher solved the\_problem with a calculator when it\_was\_discussed\_in\_class.

Did the boy solve the problem? N

28a. The\_programmer asked what the\_teenager updated the\_software for on the\_computer.

Did the programmer update the software? N

28b. The\_programmer asked whether the\_teenager updated the\_software for the app on the\_computer.

Did the programmer update the software? N

29a. The\_student wanted\_to\_know what the\_instructor reviewed the\_essay for since no\_grades\_were\_posted.

Did the student review the essay? N

29b. The\_student wanted\_to\_know whether the\_instructor reviewed the\_essay for the contest since no\_grades\_were\_posted.

Did the student review the essay? N

30a. The\_designer asked what the\_actor wore the\_hat to the other\_night.

Did the actor wear the hat? Y

30b. The\_designer asked whether the\_actor wore the\_hat to the party the other\_night.

Did the actor wear the hat? Y

31a. The\_customer wondered what the\_worker removed the\_battery from at the\_store.

Did the worker remove the battery? Y

31b. The\_customer wondered whether the\_worker removed the\_battery from the phone at the\_store.

Did the worker remove the battery? Y

32a. The\_passenger wanted\_to\_know what the\_pilot delayed the\_flight for but nobody\_knew.

Did the pilot delay the flight? Y

32b. The\_passenger wanted\_to\_know whether the\_pilot delayed the\_flight for the luggage but nobody\_knew.

Did the pilot delay the flight? Y

33a. The\_engineer asked what the\_assistant damaged the\_computer with late last\_night.

33b. The\_engineer asked whether the\_assistant damaged the\_computer with the virus late last\_night.

34a. The\_stranger wondered what the\_beggar accepted the\_money for at the\_bus\_stop.

Did the beggar accept the money? Y

34b. The\_stranger wondered whether the\_beggar accepted the\_money for some food at the\_bus\_stop.

Did the beggar accept the money? Y

35a. The\_researcher wanted\_to\_know what the\_professor attended the\_conference for when they\_met.

35b. The\_researcher wanted\_to\_know whether the\_professor attended the\_conference for the\_talk when they\_met.

36a. The\_policeman asked what the\_driver examined the\_car for after the\_crash.

36b. The\_policeman asked whether the\_driver examined the\_car for any scratches after the\_crash.

*Coordination-conditions*

*“and” version is in a; “but” version is in b.*

101a. The\_biologist studied the\_plant and its\_flower was very hard to see.

101b. The\_biologist studied the\_plant but its\_flower was very hard to see.

102a. The\_woman advertised the\_concert and the\_festival was completely sold\_out last week.

102b. The\_woman advertised the\_concert but the\_festival was completely sold\_out last week.

103a. The\_maid folded the\_blanket and the\_laundry was put in a\_big basket.

Did the maid fold the sheet? N

103b. The\_maid folded the\_blanket but the\_laundry was put in a\_big basket.

Did the maid fold the sheet? N

104a. The\_magician performed the\_trick and the\_joke was later used in a\_TV\_show.

104b. The\_magician performed the\_trick but the\_joke was later used in a\_TV\_show.

105a. The\_woman baked the\_cake and the\_pie was made by her daughter.

Did the woman bake the pie? N

105b. The\_woman baked the\_cake but the\_pie was made by her daughter.

Did the woman bake the pie? N

106a. The\_sports\_fans watched the\_match and the\_commentary was shown on another channel.

106b. The\_sports\_fans watched the\_match but the\_commentary was shown on another channel.

107a. The\_man purchased the\_painting and the\_drawing was bought by his wife.

107b. The\_man purchased the\_painting but the\_drawing was bought by his wife.

108a. The\_businessman replied\_to the\_email and the\_phone\_call was answered by his secretary.

Did the businessman return the call? N

108b. The\_businessman replied\_to the\_email but the\_phone\_call was answered by his secretary.

Did the businessman return the call? N

109a. The\_trainer planned the\_workout and the\_schedule was made by the coach.

Did the coach determine the schedule? Y

109b. The\_trainer planned the\_workout but the\_schedule was made by the coach.

Did the coach determine the schedule? Y

110a. The\_candy\_maker filled the\_bowl and the\_jar was completely filled with chocolate\_bars.

110b. The\_candy\_maker filled the\_bowl but the\_jar was completely filled with chocolate\_bars.

111a. The\_boy rolled\_up the\_carpet and the\_rug was moved by the girl.

Did the girl move the rug? Y

111b. The\_boy rolled\_up the\_carpet but the\_rug was moved by the girl.

Did the girl move the rug? Y

112a. The\_chef stirred the\_soup and the\_sauce was stirred by the assistant.

Did the chef stir the soup? Y

112b. The\_chef stirred the\_soup but the\_sauce was stirred by the assistant.

Did the chef stir the soup? Y

113a. The\_dog buried the\_bone and the\_stick was left behind the doghouse.

Did the dog bury the stick? N

113b. The\_dog buried the\_bone but the\_stick was left behind the doghouse.

Did the dog bury the stick? N

114a. The\_driver delivered the\_package and the\_letter was brought by the mailman.

Did the driver deliver the package? Y

114b. The\_driver delivered the\_package but the\_letter was brought by the mailman.

Did the driver deliver the package? Y

115a. The\_clerk sold the\_phone and the\_iPad was sold by his colleague.

Did the clerk sell the iPad? N

115b. The\_clerk sold the\_phone but the\_iPad was sold by his colleague.

Did the clerk sell the iPad? N

116a. The\_servant cleaned the\_table and the\_floor was cleaned by the the\_maid.

Did the servant clean the floor? N

116b. The\_servant cleaned the\_table but the\_floor was cleaned by the the\_maid.

Did the servant clean the floor? N

117a. The\_worker organized the\_shed and the\_garage was emptied to prepare for\_renovations.

117b. The\_worker organized the\_shed but the\_garage was emptied to prepare for\_renovations.

118a. The\_teacher graded the\_exam and the\_homework was checked by the assistant.

Did the assistant check the homework? Y

118b. The\_teacher graded the\_exam but the\_homework was checked by the assistant.

Did the assistant check the homework? Y

119a. The\_girl chased the\_cat and the\_dog was chasing the little bunny.

Did the girl chase the cat? Y

119b. The\_girl chased the\_cat but the\_dog was chasing the little bunny.

Did the girl chase the cat? Y

120a. The\_architect printed the\_design and the\_map was drawn by the assistant.

Did the assistant draw the map? Y

120b. The\_architect printed the\_design but the\_map was drawn by the assistant.

Did the assistant draw the map? Y

121a. The\_zookeeper fed the\_giraffe and the\_monkey was entertained by the trainer.

Did the zookeeper entertain the monkey? N

121b. The\_zookeeper fed the\_giraffe but the\_monkey was entertained by the trainer.

Did the zookeeper entertain the monkey? N

122a. The\_man built the\_table and the\_bench was carved by the artist.

Did the artist build the table? N

122b. The\_man built the\_table but the\_bench was carved by the artist.

Did the artist build the table? N

123a. The\_tutor explained the\_question and the\_answer was given in the textbook.

Did the tutor explain the question? Y

123b. The\_tutor explained the\_question but the\_answer was given in the textbook.

Did the tutor explain the question? Y

124a. The\_pirate hid the\_silver and the\_gold was kept in the ship.

Did the pirate hide the gold? N

124b. The\_pirate hid the\_silver but the\_gold was kept in the ship.

Did the pirate hide the gold? N

125a. The\_professor wrote the\_paper and the\_book was published by the journalist.

Did the professor publish the book? N

125b. The\_professor wrote the\_paper but the\_book was published by the journalist.

Did the professor publish the book? N

126a. The\_boy received the\_card and the\_gift was delivered a few\_days later.

126b. The\_boy received the\_card but the\_gift was delivered a few\_days later.

127a. The\_waiter served the\_meal and the\_dessert was presented by the chef.

Did the chef present the meal? N

127b. The\_waiter served the\_meal but the\_dessert was presented by the chef.

Did the chef present the meal? N

128a. The\_man read the\_note and the\_letter was mailed to the office.

128b. The\_man read the\_note but the\_letter was mailed to the office.

129a. The\_scientist mixed the\_powder and the\_liquid was poured in the bucket.

Did the scientist mix the powder? Y

129b. The\_scientist mixed the\_powder but the\_liquid was poured in the bucket.

Did the scientist mix the powder? Y

130a. The\_child planted the\_flower and the\_tree was planted by the gardener.

Did the gardener plant the tree? Y

130b. The\_child planted the\_flower but the\_tree was planted by the gardener.

Did the gardener plant the tree? Y

131a. The\_nanny prepared the\_snack and the\_drink was left in the fridge.

131b. The\_nanny prepared the\_snack but the\_drink was left in the fridge.

132a. The\_customer signed the\_form and the\_contract was signed by the manager.

Did the customer sign the contract? N

132b. The\_customer signed the\_form but the\_contract was signed by the manager.

Did the customer sign the contract? N

133a. The\_musician played the\_piano and the\_violin was tuned by the director.

Did the director tune the violin? Y

133b. The\_musician played the\_piano but the\_violin was tuned by the director.

Did the director tune the violin? Y

134a. The\_engineer sent the\_code and the\_password was changed in the system.

Did the engineer send the code? Y

134b. The\_engineer sent the\_code but the\_password was changed in the system.

Did the engineer send the code? Y

135a. The\_seller advertised the\_product and the\_discount was applied at the register.

135b. The\_seller advertised the\_product but the\_discount was applied at the register.

136a. The\_officer stamped the\_passport and the\_form was inspected by a\_second officer.

136b. The\_officer stamped the\_passport but the\_form was inspected by a\_second officer.

*Distractor Items*

301. The\_tourist wondered when the\_train would arrive from Paris.

302. The\_servant asked when the\_suite in the\_hotel might be ready so\_the\_guest\_could\_check\_in.

303. The\_advisor wanted\_to\_know when the\_grade from the\_exam could be sent to\_the\_administrators.

304. The\_librarian told\_us when the\_book from the\_collection might be returned.

305. The\_child wondered when the\_cookie from the\_jar was eaten.

306. The\_student asked when the\_meeting for the\_group would be held that\_day.

307. The\_lifeguard wondered why the\_pool in the\_neighborhood was closed since\_nobody\_knew.

Was the pool open? N

308. The\_artist asked\_ why the\_supplies were missing from the studio.

Were the supplies in the studio? N

309. The\_guide wanted\_to\_know why the\_tour for the\_castle would be delayed that\_afternoon.

Was the tour on time? N

310. The\_photographer told\_us why the\_photograph in the\_album was ripped.

Was the photograph ripped? Y

311. The\_customer wanted\_to\_know why the\_cost for the\_trip would increase after the break.

312. The\_driver told\_us why the\_bus for the\_students was late at\_the\_bus\_stop.

313. The\_man wondered how the\_decision for the\_trial would be made given\_the\_lack\_of\_evidence.

314. The\_mathematician asked how the\_solution in the\_manual was described since\_he\_was\_curious.

315. The\_guard wanted\_to\_know how the\_alarm in the\_museum could be turned off.

316. The\_biker told\_us\_ how the\_trail was designed to avoid traffic.

317. The\_policeman wondered how the\_car in the\_garage was stolen last night.

Was the car stolen? Y

318. The\_manager asked how the\_necklace in the\_store disappeared from the\_table.

319. The\_nanny told\_us that the\_cake had been in the\_oven for\_an\_hour but\_it\_was\_still\_raw.

320. The\_assistant mentioned that the\_mouse had escaped from the\_cage this\_morning.

Did the mouse escape from the cage? Y

321. The\_director said that the\_actress apologized for the\_mistake during the\_play.

322. The\_businessman saw that the\_meeting had ended with an\_agreement.

323. The\_doctor told\_us that the\_disease had gotten worse over the\_years.

Did the disease get worse? Y

324. The\_seller mentioned that the\_statue sold for thousands of dollars.

325. The\_journalist said that the\_event took place while it was raining.

Was it raining during the event? Y

326. The\_pilot saw that the\_weather was too stormy for the\_plane to take\_off.

327. The\_farmer told\_us that the\_cow had been frightened by the\_lightning last\_night.

328. The\_nanny mentioned that the\_show had been playing all day on television.

329. The\_buyer said that the\_sign fell apart by the\_stand next to the\_snacks.

Did the sign fall apart? Y

330. The\_staff saw that the\_supply decreased since the\_last time the\_store opened.

331. The\_programmer told\_us that the\_network crashed after the\_storm last night.

Was the network working after the storm? N

332. The\_woman mentioned that the\_artwork was broken after someone knocked it over.

333. The\_reporter said that the\_sun rose earlier than usual this morning.

334. The\_gardener saw that the\_tree had grown a\_lot since last\_month.

335. The\_mother told\_us that the\_boy was bitten by a\_spider.

Did a bee sting the boy? N

336. The\_friend mentioned that the\_girl fell off the\_bike while playing outside.

Did the girl fall off the scooter? N

401. The\_deer ran into the\_forest after the\_hunter tried to shoot it.

402. The\_baby played on the\_blanket while the\_grandmother sipped her coffee.

403. The\_worker knocked on the\_door before the\_director invited him in.

Did the worker knock on the door? Y

404. The\_speaker explained the\_idea as the\_people listened to the\_speech.

405. The\_stylist complained about the\_price while the\_assistant nodded her head in\_agreement.

Did the assistant complain? N

406. The\_client sat in the\_chair as the\_man cut his hair.

407. The\_athlete trained in the\_gym while the\_trainer planned his meals.

Did the athlete plan his meals? N

408. The\_dentist looked over the\_x-ray as the\_patient worried about the\_cost.

409. The\_mother laughed at the\_story while the\_child looked unhappy.

410. The\_surgeon appeared at the\_hospital after the\_nurse arranged the\_equipment for the\_surgery.

411. The\_engineer gazed at the\_plan after the\_architect explained the\_notes on the\_layout.

Did the architect explain the plan? N

412. The\_man had just reached the\_shelter as the\_wind blew the\_roof off the\_building.

413. The\_girl was\_worried about her\_grades while her\_friend ignored the\_test\_scores.

Did the friend ignore the scores? Y

414. The\_student graduated from the\_university as his\_parents attended the\_ceremony.

415. The\_daughter helped with the\_dinner while the\_mother prepared the\_table for the\_family.

Did the daughter prepare the table? N

416. The\_boss paid for the\_coffee while the\_employee checked his calendar.

417. The\_city recovered from the\_earthquake as the\_workers fixed the\_roofs of the\_buildings.

418. The\_banker responded to the\_alert while the\_bank prevented the\_robbery.

Was the bank robbed? N

419. As the\_rabbit was eating the\_carrot the\_fox came closer.

Did the rabbit come closer? N

420. While the\_family was enjoying the\_dinner the\_pet stared at its\_bowl.

421. While the\_boy practiced the\_song the\_relatives listened with excitement.

Were the relatives excited? Y

422. As the\_parent started packing the\_clothes the\_children offered to help.

423. After the\_students had handed\_in the\_test the\_teacher explained the answers.

424. Even\_though the\_man was using a\_map he managed to get lost.

425. When the\_family planned the\_wedding a\_friend agreed to take pictures.

426. While the\_child was holding the\_fork the\_parents watched with excitement.

427. As the\_celebrity was walking the\_streets his\_guards formed a\_circle around him.

428. While the\_cat was climbing the\_tree the\_kids shouted for its attention.

429. As the\_diver approached the\_water the\_crowd watched in amazement.

Was anyone watching the diver? Y

430. While the\_man was testing the\_machine his\_friend made a\_suggestion.

431. As their\_son studied abroad the\_parents worried about his\_safety.

432. Although the\_girl wanted a\_pony her\_parents ignored her wish.

Did the girl wish for a pony? Y

433. Even\_though the\_actor forgot his\_lines the\_director hired him for the\_play.

434. Although the\_boy took the\_exam the\_teacher could not pass him.

Did the boy fail? Y

435. While the\_worker was opening the\_window the\_man looked confused.

436. While the\_man was visiting the\_city his\_friends suggested a restaurant for lunch.

**Supplementary materials B: Analysis using non-transformed raw reading times**

The analysis reported in the main text uses log-transformed residual reading times. Below we report analyses using non-transformed raw reading times. We used the same cutoff procedure as in the main text, in which we first omitted all data points that were shorter than 100 ms or longer than 5000, and then omitted data points exceeding the mean plus 2.5 standard deviations for each individual. The main differences with the analysis reported in the main text are that, first, in the analysis on the raw reading times, an adaptation effect was seen in the *wh*-conditions (interaction of Condition by Number of *What* items seen); this effect was also present in the by-group analysis of the native English group, but not in the L2 group. Second, in the coordination conditions the triple interaction of Condition by Language Group by Number of *And* items was weaker. See footnote 2 in the main text for discussion.

Figure SB.1

Raw reading times for selected word positions for the native English and L2 group, *wh* conditions. The critical position is position 6. Note that the y-axis starts at different points for the two groups.



Figure SB.2

Raw reading times for position 6 in the *wh*-condition as a function of the number of *what* sentences seen, for the native English and L2 groups.

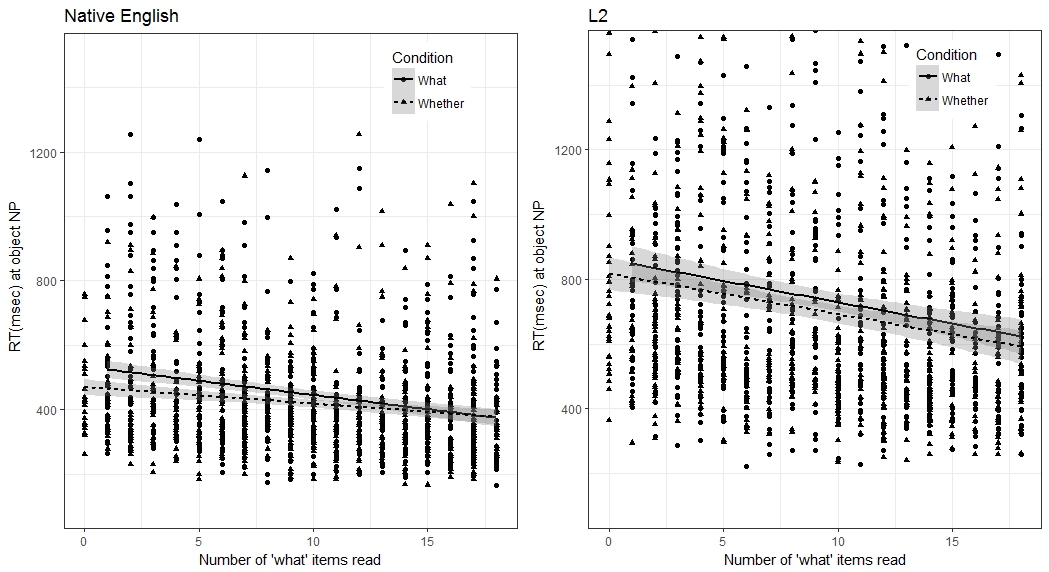


Figure SB.3

Raw readings time for selected word positions for the native English and L2 group, coordination-conditions. The critical position is position 6. Note that the y-axis starts at different points for the two groups.

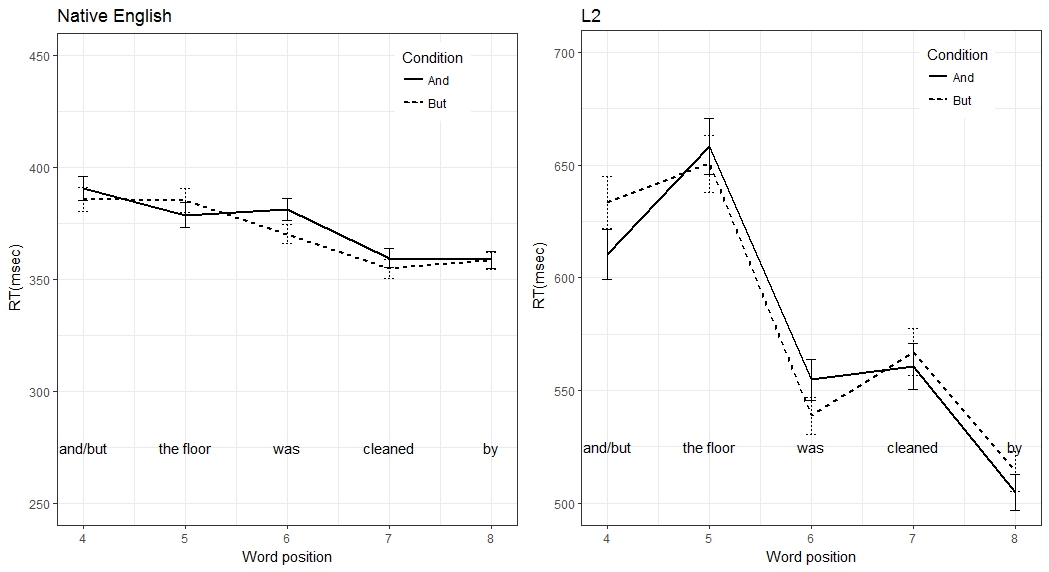


Figure SB.4

Raw reading times for position 6 in the coordination-conditions as a function of the number of *and-*sentences seen, for the native English and L2 groups. Note that the y-axis starts at different points for the two groups.

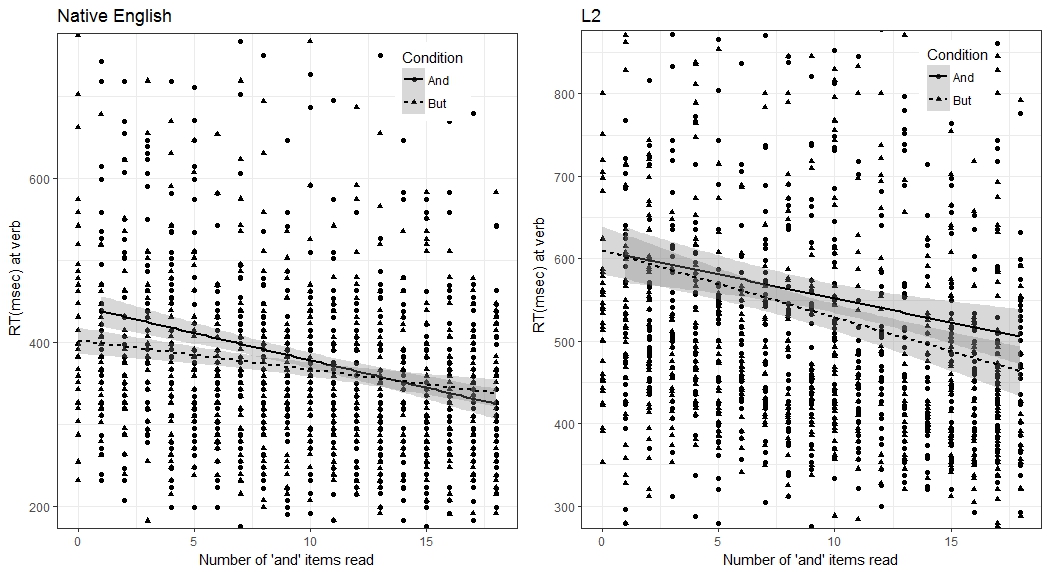


Table S1. Results from the linear mixed effects model using raw reading times for critical word position, *wh*-conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | SE | T-value | *p*-value |
| (Intercept) | 580.389 | 20.379 | 28.480 | 0.000\*\*\* |
| Condition | 39.494 | 10.475 | 3.770 | 0.000\*\*\* |
| Number of *What* seen | -86.261 | 11.275 | -7.651 | 0.000\*\*\* |
| Language Group | 285.805 | 39.547 | 7.227 | 0.000\*\*\* |
| Condition × Nr. of *What* seen | -32.552 | 15.773 | -2.064 | 0.043\* |
| Condition × Language Group | 21.586 | 20.479 | 1.054 | 0.294 |
| Nr. of *What* seen× Language Group | -42.417 | 20.080 | -2.112 | 0.038\* |
| Condition × Nr. of *What* seen × Language Group | -7.018 | 30.312 | -0.232 | 0.817 |

Note: Nr. of *What* seen: number of preceding *what* sentences, log transformed. Model: RT ~ Condition \* Nr. of *What* seen \* Language Group + (1 + Condition \* Nr. of *What* seen | Subject) + (1 + Condition \* Nr. of *What* seen | Item); 79 subjects; 36 items ; Log-Likelihood: -18804.8. In this and other tables, *P*-values were determined by lmerTest. \*\*\* *p* < 0.001, \*\* *p* < 0.01, \* *p* < 0.05, +*p* < 0.1.

Table S2. Results from the linear mixed effects model using raw reading times for critical word position, for the native English group, *wh*-conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | SE | T-value | *p*-value |
| (Intercept) | 435.881 | 16.385 | 26.603 | 0.000\*\*\* |
| Condition | 28.949 | 9.037 | 3.203 | 0.003\*\* |
| Number of *What* seen | -62.861 | 7.725 | -8.138 | 0.000\*\*\* |
| Condition × Nr. of *What* seen | -32.283 | 12.128 | -2.662 | 0.008\*\* |

Model: RT ~ Condition \* Nr. Of *What* seen + (1 + Condition \* Nr. Of *What* seen || Subject) + (1 + Condition \* Nr. Of *What* seen || Item); 40 subjects; 36 Items; Log-Likelihood: -8828.3.

Table S3. Results from the linear mixed effects model using raw reading times for critical word position, for the L2 group, *wh*-conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | SE | T-value | *p*-value |
| (Intercept) | 726.259 | 35.634 | 20.381 | 0.000\*\*\* |
| Condition | 52.067 | 18.269 | 2.850 | 0.007\*\* |
| Number of *What* seen | -105.910 | 18.563 | -5.705 | 0.000\*\*\* |
| LexTale | -5.790 | 3.099 | -1.869 | 0.069+ |
| Condition × Nr. of *What* seen | -36.713 | 26.886 | -1.366 | 0.180 |
| Condition × LexTale | -1.143 | 1.600 | -0.714 | 0.479 |
| Nr. of *What* seen× LexTale | 2.991 | 1.535 | 1.949 | 0.059+ |
| Condition × Nr. of *What* seen × LexTale | 0.495 | 2.363 | 0.210 | 0.835 |

Model: RT ~ Condition \* Nr. Of *What* seen + (1 + Condition \* Nr. Of *What* seen | Subject) + (1 + Condition \* Nr. Of *What* seen | Item); 39 subjects; 36 Items; Log-Likelihood: -9678.6.

Table S4. Results from the linear mixed effects model using raw reading times for critical word position, coordination-conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | SE | T-value | *p*-value |
| (Intercept) | 460.751 | 10.815 | 42.604 | 0.000\*\*\* |
| Condition | 21.338 | 6.273 | 3.402 | 0.001\*\*\* |
| Number of *And* seen | -47.015 | 6.160 | -7.632 | 0.000\*\*\* |
| Language Group | 168.180 | 21.051 | 7.989 | 0.000\*\*\* |
| Condition × Nr. of *And* seen | -11.524 | 9.609 | -1.199 | 0.233 |
| Condition × Language Group | 9.400 | 12.537 | 0.750 | 0.455 |
| Nr. of *And* seen× Language Group | -15.770 | 12.302 | -1.282 | 0.204 |
| Condition × Nr. of *And* seen × Language Group | 35.377 | 18.995 | 1.862 | 0.065+ |

Note: Nr. of *And* seen: number of preceding *And* sentences, log transformed. Model: RT ~ Condition \* Nr. of *And* seen \* Language Group + (1 + Condition \* Nr. of *And* seen | Subject) + (1 + Condition \* Nr. of *And* seen |Item); 79 subjects; 36 items ; Log-Likelihood: -18330.8

Table S5. Results from the linear mixed effects model using raw reading times for critical word position, for the native English group, coordination-conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | SE | T-value | *p*-value |
| (Intercept) | 376.741 | 11.261 | 33.454 | 0.000\*\*\* |
| Condition | 15.725 | 6.082 | 2.585 | 0.014\* |
| Number of *And* seen | -38.891 | 5.948 | -6.539 | 0.000\*\*\* |
| Condition × Nr. of *And* seen | -28.282 | 10.397 | -2.720 | 0.010\* |

Model: RT ~ Condition \* Nr. Of *And* seen + (1 + Condition \* Nr. Of *And* seen | Subject) + (1 + Condition \* Nr. Of *And* seen | Item); 40 subjects; 36 Items; Log-Likelihood: -8655.9.

Table S6. Results from the linear mixed effects model using raw reading times for critical word position for the L2 group, coordination-conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | SE | T-value | *p*-value |
| (Intercept) | 545.984 | 17.754 | 30.752 | 0.000\*\*\* |
| Condition | 26.785 | 10.551 | 2.538 | 0.011\* |
| Number of *And* seen | -55.216 | 10.908 | -5.062 | 0.000\*\*\* |
| LexTale | -2.566 | 1.553 | -1.652 | 0.107 |
| Condition × Nr. of *And* seen | 5.603 | 15.135 | 0.370 | 0.711 |
| Condition × LexTale | -0.508 | 0.932 | -0.545 | 0.586 |
| Nr. of *And* seen× LexTale | -1.065 | 0.958 | -1.112 | 0.274 |
| Condition × Nr. of *And* seen × LexTale | 0.208 | 1.320 | 0.157 | 0.875 |

Model: RT ~ Condition \* Nr. of *And* seen + (1 + Condition \* Nr. of *And* seen || Subject) + (1 + Condition \* Nr. of *And* seen || Item); 39 subjects; 36 Items; Log-Likelihood: -9392.3.

**Supplementary materials C: Analysis on log residual reading times of the *wh*-conditions, using a more liberal cutoff**

A commonly used criterion is to omit data points shorter than 100 ms and longer than 2000 ms, without further cutoff procedures, assuming that the log transformation reduces outliers (Fine, Jaeger, Farmer, & Qian, 2013). In the analysis reported here, we applied a similar procedure to our data. However, the upper limit of 2000 ms may not be appropriate for L2 learners. We therefore approximated the high cutoff value of 2000 ms by taking the mean plus 6.5 standard deviations for the English speakers (calculated over all data points). This amounted to 1947 ms. We then calculated the mean and standard deviation for the L2 data, and also used the mean plus 6.5 standard deviations as a high cutoff (3880 ms) for the L2 data. In both groups, we also omitted data points shorter than 100 ms. This procedure affected less than 0.5% of the all data points in either group. Restricted to the critical word positions (point of disambiguation), the cutoff also affected less than 0.5% of the data for either group. As in the analysis reported in the main text, we then log-transformed the reading times (natural logarithm) to adjust for the skewedness of the distribution. The Box-Cox procedure (Box & Cox, 1964) confirmed that a log transformation was appropriate (maximal λ was -0.6). For the native and L2 groups separately, we calculated residual reading times based on a linear mixed effects model on all data (experimental items as well as distractors), with the length of the word in the number of characters, and the (natural) log-transformed position of the trial in the experiment as fixed effects. Random effects included by-participant intercepts and by-participant slopes for word length and the log of the trial position. As addressed in the discussion of the main text, the native English group showed adaptation effects in this analysis, but not in the analysis reported in the main text using a more conservative cutoff procedure. This suggests that the adaptation effect is driven by only 5% of the data.

Figure SC.1.

Log residual reading times for selected word positions for the native English and L2 group, *wh* conditions. The critical position is position 6. Note that the y-axis starts at different points for the two groups.

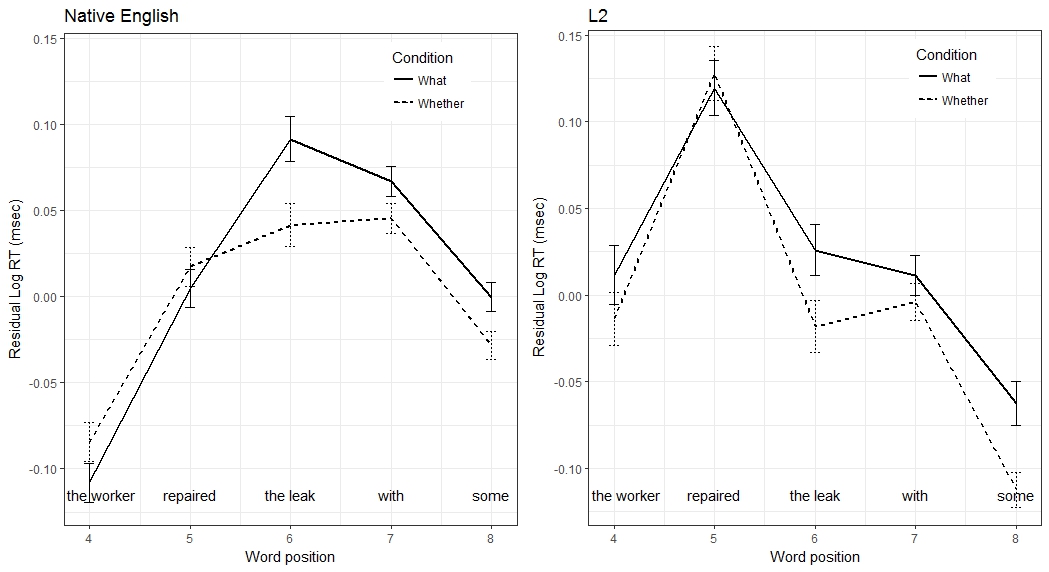


Figure SC.2

Log residual reading times for position 6 in the *wh*-condition as a function of the number of *what* sentences seen, for the native English and L2 groups.

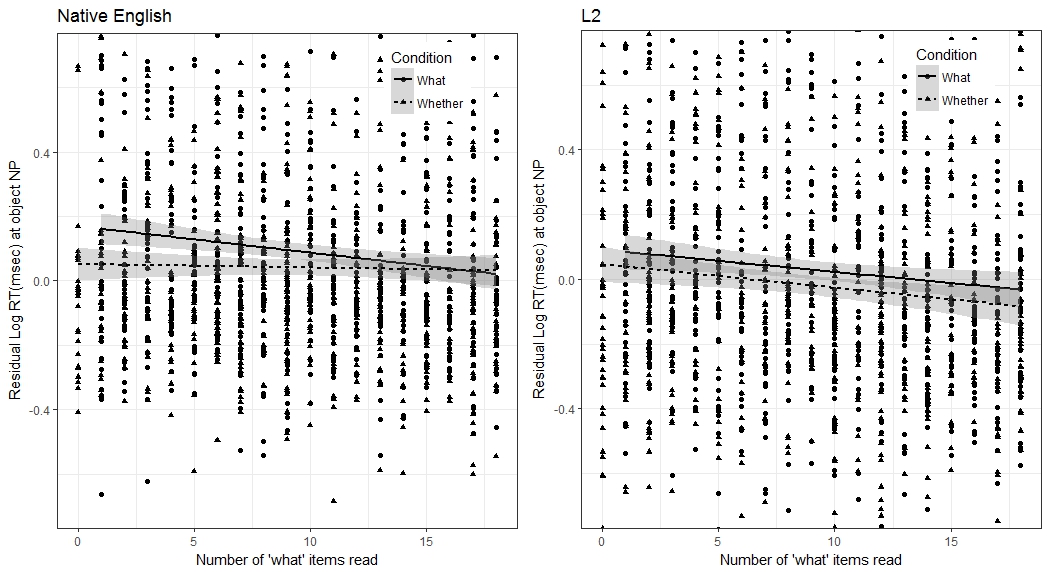


Table S7. Results from the linear mixed effects model using log residual reading times with a liberal cutoff, critical word position, *wh*-conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | SE | T-value | *p*-value |
| (Intercept) | 0.037 | 0.016 | 2.279 | 0.025\* |
| Condition | 0.052 | 0.016 | 3.249 | 0.002\*\* |
| Number of *What* seen | -0.043 | 0.014 | -3.102 | 0.003\*\* |
| Language Group | -0.060 | 0.027 | -2.226 | 0.029\* |
| Condition × Nr. of *What* seen | -0.047 | 0.022 | -2.163 | 0.035\* |
| Condition × Language Group | -0.009 | 0.030 | -0.308 | 0.759 |
| Nr. of *What* seen× Language Group | -0.022 | 0.025 | -0.871 | 0.386 |
| Condition × Nr. of *What* seen × Language Group | 0.052 | 0.039 | 1.338 | 0.182 |

Note: Nr. of *What* seen: number of preceding *what* sentences, log transformed. Model: RT ~ Condition \* Nr. of *What* seen \* Language Group + (1 + Condition \* Nr. of *What* seen | Subject) + (1 + Condition \* Nr. of *What* seen | Item); 79 subjects; 36 items ; Log-Likelihood: -1060.1. In this and other tables, *P*-values were determined by lmerTest. \*\*\* *p* < 0.001, \*\* *p* < 0.01, \* *p* < 0.05, +*p* < 0.1.

Table S8. Results from the linear mixed effects model for the native English group, *wh*-conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | SE | T-value | *p*-value |
| (Intercept) | 0.067 | 0.015 | 4.424 | 0.000\*\*\* |
| Condition | 0.054 | 0.021 | 2.525 | 0.016\* |
| Number of *What* seen | -0.036 | 0.018 | -1.956 | 0.059+ |
| Condition × Nr. of *What* seen | -0.067 | 0.032 | -2.074 | 0.043\* |

Model: RT ~ Condition \* Nr. Of *What* seen + (1 + Condition \* Nr. Of *What* seen | Subject) + (1 + Condition \* Nr. Of *What* seen | Item); 40 subjects; 36 Items; Log-Likelihood: -453.7.

Table S9. Results from the linear mixed effects model for the L2 group, *wh*-conditions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | SE | T-value | *p*-value |
| (Intercept) | 0.006 | 0.026 | 0.228 | 0.820 |
| Condition | 0.051 | 0.023 | 2.282 | 0.027\* |
| Number of *What* seen | -0.052 | 0.019 | -2.797 | 0.009\*\* |
| LexTale | 0.001 | 0.002 | 0.504 | 0.617 |
| Condition × Nr. of *What* seen | -0.023 | 0.029 | -0.790 | 0.431 |
| Condition × LexTale | -0.001 | 0.002 | -0.451 | 0.654 |
| Nr. of *What* seen× LexTale | 0.002 | 0.002 | 1.448 | 0.156 |
| Condition × Nr. of *What* seen × LexTale | -0.002 | 0.003 | -0.680 | 0.497 |

Model: RT ~ Condition \* Nr. Of *What* seen + (1 + Condition \* Nr. Of *What* seen | Subject) + (1 + Condition \* Nr. Of *What* seen | Item); 39 subjects; 36 Items; Log-Likelihood: -593.6.

**References**

Box, G. E., & Cox, D. R. (1964). An analysis of transformations. *Journal of the Royal Statistical Society Series B (Methodological),* 26, 211-252.

Fine, A. B., Jaeger, T. F., Farmer, T. A., & Qian, T. (2013). Rapid expectation adaptation during syntactic comprehension. *PLoS ONE,* 8, 1-18. doi:10.1371/journal.pone.0077661