Expectations from relative clauses: Real-time coherence updates in discourse processing
J. Hoek, H. Rohde, J. Evers-Vermeul, & T. J. M. Sanders
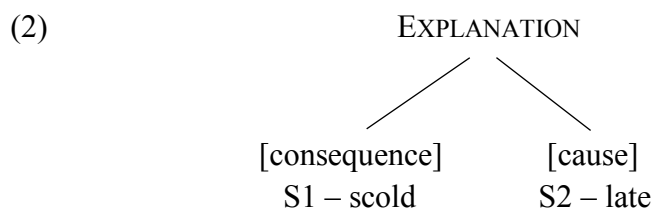
Abstract
When processing a text, comprehenders use available cues to anticipate both upcoming content and the dependencies that comprise the structure of the growing discourse. In an eye-tracking-while-reading experiment, we test discourse updating in passages in which dependencies are implicit and the segments convey content that is not required to participate in any coherence-driven inference. This study provides strong evidence of comprehenders' ability to build implicit non-obligatory discourse structure in real time.

1   Introduction
Language processing depends on establishing not only the meaning of sentences in isolation, but also the connections that hold between sentences in a larger discourse. Such dependencies are what makes a text more than simply an arbitrary collection of sentences but rather a coherent discourse with a larger inferable purpose and a meaningful underlying structure. The analysis of discourse structure is typically approached with an inventory of possible coherence relations that can be inferred between segments or can be signaled explicitly with markers like connectives (e.g., Asher & Lascarides, 2003; Mann & Thompson, 1988; Prasad et al., 2008; Roberts, 2012; Sanders, Spooren, & Noordman, 1992). In (1), the segments S1 and S2 are linked via the connective *because*, which marks S2 as the EXPLANATION for the situation described in S1. Understanding (1) thus requires building a dependency like (2).

(1) [The teacher scolded the student]$_{S1}$ because [the student was late.]$_{S2}$

(2)   EXPLANATION

                    [consequence]   [cause]
                       S1 – scold   S2 – late

Prior work on discourse expectations suggests that comprehenders use available cues to make guesses both about upcoming content (Köhne & Demberg, 2013, Koornneef & Van Berkum, 2006, Xiang & Kuperberg, 2015) and more abstractly about the dependencies that will comprise the structure of the growing discourse (Scholman, Rohde, & Demberg, 2017). For example, verbs like *scold* in the class of so-called implicit causality (IC) verbs (e.g., Au, 1986; Garvey & Caramazza, 1974; McKoon, Greene, & Ratcliff, 1993) create an expectation for an upcoming segment that provides an EXPLANATION. IC-driven expectations have been observed even before any connective is encountered, via anticipatory eye movements to a visual location associated with EXPLANATION (Rohde & Horton, 2014), as well as in faster processing for the connective *because* compared with *and* (Koorneef & Sanders, 2013).

Prior work, however, targets contexts in which the discourse dependencies are marked explicitly with overt connectives or the discourse segments themselves are easily identifiable because they correspond to free-standing clauses. Here we use eye-tracking-while-reading to test whether and how quickly discourse updating emerges in contexts in which these constraints are lifted: The coherence relation is implicit and the segments themselves are clauses that need not form discourse dependencies in order for discourse to cohere.

2   Implicit relations and implicit causality

Unlike the relation in (1), many coherence relations show no explicit marking, as in (3) (Asr & Demberg 2012; Taboada, 2006). Nonetheless, a comprehender who encounters (3) would likely infer an EXPLANATION relation, given the combination of the IC-driven biases of *scold* in S1 (*why did the teacher scold the student?*), the ease of interpreting S2 to plausibly explain the scolding, and the juxtaposition of S1~S2 which demands the inference of some relation to ensure passage coherence.

   (3) [The teacher scolded the student.]$_{S1}$ [The student was late.]$_{S2}$

However, inferable relations can sometimes hold between segments that are smaller than free-standing matrix clauses, as in (4) (Hoek, Rohde, Evers-Vermeul, & Sanders, *to appear*; Rohde, Levy, & Kehler, 2011). In (4), the content of the relative clause (RC) provides a plausible explanation of the matrix clause event, despite the lack of an explicit connective and despite the fact that restrictive RCs serve primarily to restrict reference and are not required to participate in coherence relations. For instance, the function of the RC in (5) is merely to ensure referential uniqueness of 'the student'.

   (4) [The teacher scolded the student]$_{S2}$ [who was late.]$_{S2}$
   (5) [The teacher scolded the student]$_{S2}$ [who sat by the window.]$_{S2}$

The study we report here compares contexts like (4-5) to test if the non-obligatory inference of a matrix~RC coherence relation—a dependency that is possible but never required and that remains entirely implicit—can in turn influence subsequent expectations about upcoming discourse dependencies. If comprehenders consider inferences of this type in real time, are their updated coherence expectations measurable in their processing of a subsequent segment?

   Prior work on real-time processing of matrix~RC relations has only targeted the interpretation of the RC itself, not its repercussions on the processing of subsequent segments. That work shows that an RC is read fastest when its content provides an inferable reason for the matrix clause event (EXPLANATION RC), slower for an RC whose content is limited to restricting reference (neutral RC), and slowest for content that would be unexpected as an explanation for the matrix clause event (CONCESSIVE RC) (Hoek et al., to appear; see also Rohde et al., 2011). With regards to the integration of subsequent material, prior work has tested the processing of connectives and demonstrated the speed at which comprehenders use cues such as an IC verb in one clause to generate expectations for an upcoming EXPLANATION in the next. In an eye-tracking-while-reading study with IC contexts, Koornneef and Sanders (2013) found faster reading times for *because* over *and* at the first spillover region after the

connective in first gaze and regression path measures (the former typically taken as evidence of effects at early moments of processing). However, that work did not test whether the IC-driven preference for an upcoming EXPLANATION can be modulated by context. There is some evidence that RCs can modulate the EXPLANATION preference (Kehler & Rohde, 2019), but that evidence comes only from offline studies: In a story continuation task, prompts like (4) with an EXPLANATION RC yielded fewer upcoming segments that explained the matrix clause event, compared to prompts like (5) in which the RC provided no plausible explanation.

These findings raise the question of whether content made available via an RC can influence comprehenders' real-time processing of a subsequent coherence relation, even though RCs lack explicit coherence marking and do not require discourse segment status. We therefore probe comprehenders' preferences for upcoming coherence relations by measuring reading times at a segment-initial connective in a 2 × 2 design crossing RC type and connective: *The teacher scolds the student [who is late / who sits by the window] [because / and so]….* These two connectives signal EXPLANATION and CONSEQUENCE respectively, two relations whose relative expectedness is predicted to vary with RC type in IC contexts.

We predict an interaction. In keeping with prior work, the IC matrix verb is expected to bias comprehenders in favor of an upcoming EXPLANATION, thereby making *because* easier, and thus faster to process than *and so*; this pattern should be strongest when the RC has failed to provide any plausible EXPLANATION for the IC matrix event (i.e., the neutral RC, *who sits by the window*). Crucially, if comprehenders update their IC-driven biases based on the content of an RC—one that enters into a discourse dependency only non-obligatorily—the presence of an inferable EXPLANATION (i.e., *who is late*) is expected to reduce or reverse this pattern. Our analysis follows prior work on IC-driven coherence effects that have targeted the connective and spillover regions. Of particular interest is the timing of the predicted interaction relative to the main effect of the connective: Is there a delay in the modulation of the EXPLANATION bias or is the interaction apparent in the same regions in which coherence biases have previously been shown, albeit in contexts with more uniform cues and for segments with less ambiguous status?

3   Method

3.1   Participants

79 native speakers of English were recruited at Lancaster University. They participated in exchange for course credits. Data from four participants were discarded because of computer or eye-tracker problems, which left us with data from 75 participants (mean age 20.19, age range 18-41, 58 women).

3.2   Materials

32 experimental stimuli were intermixed with 78 filler items similar to the target items in terms of length and complexity. The target stimuli contained an introductory sentence, a multi-clause target sentence, and a wrap-up sentence (Table 1; see Appendix for all target items).

Table 1

Sample item with target sentence in all four conditions

Intro	Let me fill you in on the latest company gossip.
neutral RC + because	Diane fired the guy from the London office who was here last month because astoundingly he hired a stripper for the Christmas party.
neutral RC + and so	Diane fired the guy from the London office who was here last month and so astoundingly he hired a lawyer to sue the company.
causal RC + because	Diane fired the guy from the London office who was embezzling money because astoundingly he hired a stripper for the Christmas party.
causal RC + and so	Diane fired the guy from the London office who was embezzling money and so astoundingly he hired a lawyer to sue the company.
Wrap-up	Also, Harold in accounting has received a promotion.

In the target sentences, we varied the RC in S1 (neutral vs. causal) and the explicit segment-initial connective before S2 (*because* vs. *and so*). S1 contained a main clause with an NP2-biased IC verb and an object-modifying RC. S1 was linked to S2 with the explicit connective.[1]

We used *and so* instead of just *so* for signaling a CONSEQUENCE relation to create a connective region that was approximately as long as *because* and to avoid the potential interpretation of *so* as meaning *so that*. S2 consisted of a single clause containing an adverbial and an unambiguous pronoun co-referent with the object of S1. The adverbial provides a spill-over region before the pronoun (since IC verbs also affect expectations about the pronoun). Target items were distributed over four lists. Each participant saw every item only once, in one of the four conditions.

3.3 Procedure

After receiving instructions and signing a consent form, participants were seated approximately 60 cm from the monitor, with their heads on a chin rest. Eye movements were recorded using the SR Research Eyelink 1000 at a sampling rate of 500 Hz. The experiment was split into two blocks. Halfway through, participants had a short break during which they performed another task, which did not involve a computer. Participants then returned to the monitor, were recalibrated, and finished the experiment. The whole session took approximately an hour.

Participants were presented with a verification statement after 25% of all items (target or filler). The verification statements were included in the experiment to promote careful reading; no reaction time was measured. The verification statements for the target stimuli always inquired about either the first or the last sentence of the item.[2]

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[1] It should be noted that even though the connective can theoretically be attached within the RC in all items/conditions (e.g., *Yesterday, she scolded the boy who sits directly in front of her because it is the only spot in the classroom where he can focus.*), this seems to be highly dispreferred by language users, see Experiment 2 in Hoek et al. (to appear). Participants can thus be expected to relate the connective to the matrix clause (+RC).

[2] Mean accuracy on the verification statements was 87.5% on all verification statements (50.3%-100%) and 91.3% on those for target items only (50%-100%). We did not analyze by condition since there were only verification questions on eight target items.

3.4 Data clean-up and analysis

Fixations shorter than 80 ms and within one degree of a consecutive longer fixation were merged with the longer fixation. Remaining reading times shorter than 80 ms were removed. Finally, outliers were removed in all reading times by replacing reading times of more than two standard deviations from both the participants' and the condition's mean by the value that corresponded, depending on the direction of the outlier, to either two standard deviations below or above the mean (2.0% of the data). See Hoek, Rohde, Evers-Vermeul and Sanders (2020) for the final dataset.

We analyzed two regions from the target sentences: the connective region and the connective spill-over region, see (6).

(6) … [because]connective [astoundingly]spill-over …

For each region, we analyzed three reading time measures: *first pass duration* (FP: the time spent in a region until leaving the region for the first time in any direction), *regression path duration* (RP: the time spent in a region plus all regressions to previous regions before leaving the region for the first time to the right), and *total fixation duration* (TF: the total time spent in a region). FP and RP duration are both more associated with immediate processing difficulty; TF duration is more indicative of later processing difficulty (e.g., Liversedge, Paterson, & Pickering, 1998).

We analyzed the data using linear mixed effects regression models (Baayen, Davidson, & Bates, 2008) using the lme4 package (Bates, Maechler, Bolker, & Walker, 2015) in R (R Development Core Team, 2019), with fixed effects for RC type, Connective (both deviation coded) and their interaction, as well as random effects of participant and item. In addition, we included a covariate for trial number to account for any variance due to participants' reading times speeding up over the course of experiments. We used the maximal random effects structure permitted by the data (Barr, Levy, Scheepers, & Tily, 2013). The significance of fixed effects was determined by performing likelihood ratio tests to compare the fit of the model to that of a model with the same random effects structure that did not include the fixed effect.

4   Results

Table 2 contains the mean reading times and standard deviations for each reading time measure per condition and region. There was no significant effect of Connective or RC type at the connective region ($p > .05$ for all measures).[3] On the connective spill-over region, there was a main effect of Connective on all three reading time measures, which is in line with previous findings that IC verbs generally favor subsequent EXPLANATIONS, the *because* condition was read faster than the *and so* condition (FP: ß=38.91, *SE*=10.39, *t*=3.74, *p*<.001; RP: ß=87.86, *SE*=23.85, *t*=3.68, *p*<.001; TF: ß=68.83, *SE*=13.81, *t*=4.98, *p*<.001). We also found the predicted interaction between Connective and RC on RP (ß=59.40, *SE*=29.52, *t*=2.01, *p*<.05) and TF duration (ß=57.54, SE=22.28, *t*=2.58, *p*<.01) but not on FP (ß=14.73, SE=12.59, *t*=1.17, *p*=.24). Figure 1 shows the results at the spillover region for RP and TP durations; the

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[3] All models also revealed a main effect of trial number that indicated that participants' reading times sped up throughout the experiment (p<.05 in all main models).

difference in reading times between the *because* and *and so* condition is larger after a neutral RC than after a causal RC.[4] This pattern is in keeping with the prediction that causal RCs can satisfy the expectation for an EXPLANATION, rendering subsequent *because*-clauses more surprising and subsequent *and so*-clauses less surprising.[5]

Table 2

Mean reading times and standard deviations per measure per condition per region, in milliseconds

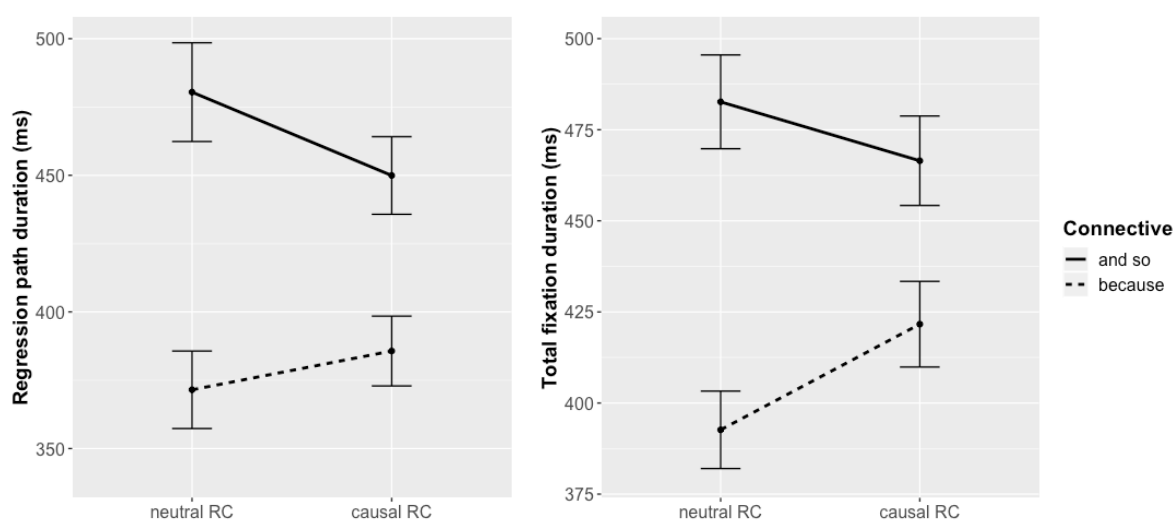| | Connective | | | | | | Connective spill-over | | | | | |
| | FP dur | | RP dur | | TF dur | | FP dur | | RP dur | | TF dur | |
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
neutral+*because*	243	120	315	271	334	217	281	141	371	338	393	254
neutral+*and so*	254	146	320	294	360	252	322	211	480	430	483	306
causal+*because*	233	104	296	244	340	200	292	156	386	305	422	281
causal+*and so*	249	139	298	254	344	217	325	207	450	339	466	293

Figure 1. Regression path duration (left) and total fixation duration (right) at the connective spill-over region. Error bars represent the standard error of the mean.

5   Discussion and conclusion

This study tested the speed and flexibility with which comprehenders update expectations about discourse structure in real time, even if the information leading to this update is only expressed in RCs. In line with the well-established observation that implicit causality verbs favor subsequent EXPLANATIONS, reading times were faster in the condition with *because*, a prototypical marker of EXPLANATION, than in the condition with *and so*, a prototypical marker of CONSEQUENCE. This result replicates previous findings at the same post-connective spillover region in similarly early measures (FP, RP, and TF duration). As predicted, we found the critical interaction at the same region: RCs that provided a plausible EXPLANATION for the contents of the matrix clause led to longer reading times following a subsequent *because*, while

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[4] Follow-up analyses on the relevant subsets of the data confirm this: For both the RP and the TP, the difference between the *because* and *and so* condition was significant, but in both measures the difference was bigger after neutral RCs (RP: ß=114.02, *SE*=27.61, *t*=4.13, *p*<.001; TP: ß=98.35, *SE*=20.94, *t*=4.70, *p*<.001) than after causal RCs (RP ß=55.91, *SE*=17.58, *t*=3.18, *p*<0.01; TP: ß=39.92, *SE*=15.69, *t*=2.55, *p*<.05).
[5] For full model output, see tables in the supplemental material: https://tinyurl.com/RCsupplementaryfiles.

speeding up reading times following a subsequent *and so*. This effect can be attributed to the updating of discourse structural expectations on the basis of the RC. The RC was thus found to modulate the EXPLANATION bias in RP and TF duration, but not the FP duration, the reading time measure most indicative of immediate processing difficulty.

Our results suggest that RCs, which need not convey information relevant at the discourse level, affect processing of subsequent linguistic material differently depending on whether the contents of the RC can be causally related to the contents of the matrix clause. These results provide the first online evidence that comprehenders use non-obligatory inferences about coherence relations (matrix~RC relations) to update their discourse structural expectations and that they do so remarkably fast. Although not visible in FP duration, the interaction does occur at the same post-connective spillover region where prior work has found evidence of IC-driven EXPLANATION biases (Koornneef & Sanders, 2013), so any delay that arises from this RC-driven modulation is very small.

The establishment of effects from non-obligatory inferences with RCs raises further questions about what other material may have been set aside as too small to constitute a discourse segment to participate in coherence relations. For example, adjectives are not themselves clausal but they permit coherence inferences in certain contexts (e.g., *the loud student annoyed everyone*, see also Webber, 1991). An adequate model of pragmatic processing must ensure that these and other cues that participate in non-obligatory discourse dependencies can still influence how comprehenders build discourse structure. Relatedly, our results are a reminder that models that focus only on comprehenders' processing of the surface manifestations of coherence relations (overt connectives) will fail to capture the range of inferred dependencies in real-time discourse parsing.

In sum, this experiment extends findings from offline continuation studies to demonstrate the speed and flexibility with which comprehenders integrate linguistic material into their representation of the discourse to generate and update expectations about upcoming discourse structure.

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Appendix: Experimental items

1.

Intro	We were recently involved in a law suit.
neutral RC + because	We were suing the neighbours from upstairs who moved in last year because suddenly they decided it was okay to smoke in the building.
neutral RC + and so	We were suing the neighbours from upstairs who moved in last year and so suddenly they decided we were unfriendly.
causal RC + because	We were suing the neighbours from upstairs who flooded our flat last year because suddenly they decided it was okay to smoke in the building.
causal RC + and so	We were suing the neighbours from upstairs who flooded our flat last year and so suddenly they decided we were unfriendly.
Wrap-up	The hearing took place last Monday.

2.

Intro	The company meeting ended with a few announcements.
neutral RC + because	Susan praised the accountant who is always wearing a blue shirt because finally he realized that he must show up for meetings on time.
neutral RC + and so	Susan praised the accountant who is always wearing a blue shirt and so finally he realized that people do actually notice his hard work.
causal RC + because	Susan praised the accountant who is always working overtime because finally he realized that he must show up for meetings on time.
causal RC + and so	Susan praised the accountant who is always working overtime and so finally he realized that people do actually notice his hard work.
Wrap-up	Everyone applauded politely.

3.

Intro	Let me fill you in on the latest company gossip.
neutral RC + because	Diane fired the guy from the London office who was here last month because astoundingly he hired a stripper for the Christmas party.
neutral RC + and so	Diane fired the guy from the London office who was here last month and so astoundingly he hired a lawyer to sue the company.
causal RC + because	Diane fired the guy from the London office who was embezzling money because astoundingly he hired a stripper for the Christmas party.
causal RC + and so	Diane fired the guy from the London office who was embezzling money and so astoundingly he hired a lawyer to sue the company.
Wrap-up	Also, Harold in accounting has received a promotion.
Verification statement	*Harold received a promotion.*

4.

Intro	Mr. Fitzgerald was a real grouch.
neutral RC + because	He criticized the girl from next door who was on the swimming team because sometimes she would ignore the stop sign at the end of their street.
neutral RC + and so	He criticized the girl from next door who was on the swim team and so sometimes she would ignore him when they ran into each other on the street.
causal RC + because	He criticized the girl from next door who often smoked in her bedroom because sometimes she would ignore the stop sign at the end of their street.
causal RC + and so	He criticized the girl from next door who often smoked in her bedroom and so sometimes she would ignore him when they ran into each other on the street.
Wrap-up	He also made mean comments whenever the local kids were playing outside.

5.

Intro	Paul loved the clothing shop in his home town.
neutral RC + because	He really valued the lady at the shop who sat behind the counter because often she would sense if he was in need of a compliment on his outfit.
neutral RC + and so	He really valued the lady at the shop who sat behind the counter and so often she would sense that he really appreciated her help.
causal RC + because	He really valued the lady at the shop who helped him find his favourite suit because often she would sense if he was in need of a compliment on his outfit.
causal RC + and so	He really valued the lady at the shop who helped him find his favourite suit and so often she would sense that he really appreciated her help.
Wrap-up	Unfortunately, the store closed in June.

6.

Intro	Yesterday, Natalie had to go to hospital.
neutral RC + because	She distrusted the doctor who would be setting her leg because supposedly he received the worst patient reviews in the district.
neutral RC + and so	She distrusted the doctor who would be setting her leg and so supposedly he received several questions about the procedure he was following.
causal RC + because	She distrusted the doctor who had messed up the procedure last time because supposedly he received the worst patient reviews in the district.
causal RC + and so	She distrusted the doctor who had messed up the procedure last time and so supposedly he received several questions about the procedure he was following.
Wrap-up	She was allowed to go home just after lunch.
Verification statement	*Natalie had to go to hospital.*

7.

Intro	Roy was walking to the farmers' market on a sunny morning.
neutral RC + because	He congratulated the actress who lived across the street because again she was on the short-list for an award.
neutral RC + and so	He congratulated the actress who lived across the street and so again she was on the receiving end of a compliment.
causal RC + because	He congratulated the actress who had finished the marathon because again she was on the short-list for an award.
causal RC + and so	He congratulated the actress who had finished the marathon and so again she was on the receiving end of a compliment.
Wrap-up	He also greeted the local dog walker with six dogs in tow.
Verification statement	*Roy greeted the dog walker.*

8.

Intro	Today is the last day of school before Christmas.
neutral RC + because	I complimented the child who has recently moved here from Spain because obviously she has been having a hard time adjusting to our customs.
neutral RC + and so	I complimented the child who has recently moved here from Spain and so obviously she has been smiling from ear to ear for the last few minutes.
causal RC + because	I complimented the child who had gotten a perfect test score because obviously she has been having a hard time with her parents' divorce.
causal RC + and so	I complimented the child who had gotten a perfect test score and so obviously she has been smiling from ear to ear for the last few minutes.
Wrap-up	This afternoon, we will all sing carols and eat gingerbread cookies.

9.

Intro	Emily is having a tough time teaching Year Three this year.
neutral RC + because	Yesterday, she scolded the boy who sits directly in front of her because shockingly he threatened to pee on her desk.
neutral RC + and so	Yesterday, she scolded the boy who sits directly in front of her and so shockingly he threatened to pee on her desk.
causal RC + because	Yesterday, she scolded the boy who had thrown a pair of scissors because shockingly he threatened to pee on her desk.
causal RC + and so	Yesterday, she scolded the boy who had thrown a pair of scissors and so shockingly he threatened to pee on her desk.
Wrap-up	Summer break cannot come soon enough for Emily.

10.

Intro	Oliver was caught up in some family drama.
neutral RC + because	He had publicly condemned the wealthy aunt who lived in Scotland because reportedly she was in the possession of Nazi gold.
neutral RC + and so	He had publicly condemned the wealthy aunt who lived in Scotland and so reportedly she was in the process of cutting him out of her will.
causal RC + because	He had publicly condemned the wealthy aunt who had verbally abused her butler because reportedly she was in the possession of Nazi gold.
causal RC + and so	He had publicly condemned the wealthy aunt who verbally abused her butler and so reportedly she was in the process of cutting him out of her will.
Wrap-up	The upcoming family reunion was going to be an interesting event.

11.

Intro	Sally attended an election debate.
neutral RC + because	She enthusiastically applauded the politician who presented during the final hour because in the end he had the most inspiring message of the day.
neutral RC + and so	She enthusiastically applauded the politician who presented during the final hour of and so in the end he had the idea to invite her on stage.
causal RC + because	She enthusiastically applauded the politician who received a humanitarian award because in the end he had the most inspiring message of the day.
causal RC + and so	She enthusiastically applauded the politician who received a humanitarian award and so in the end he had the idea to invite her on stage.
Wrap-up	The event ended with a short performance by a local band.

12.

Intro	Geoff was on a red-eye flight to New York.
neutral RC + because	He ridiculed the stewardess who was walking down the aisle because clearly she refused to acknowledge that she needed a dress in a much larger size.
neutral RC + and so	He ridiculed the stewardess who was walking down the aisle and so clearly she refused to provide him with any kind of service for the rest of the flight.
causal RC + because	He ridiculed the stewardess who crashed the drink cart into one of the seats because clearly she refused to acknowledge that she needed a dress in a much larger size.
causal RC + and so	He ridiculed the stewardess who crashed the drink cart into one of the seats and so clearly she refused to provide him with any kind of service for the rest of the flight.
Wrap-up	The other passengers thought Geoff was incredibly rude.
Verification statement	*Geoff took a red-eye flight to New Mexico.*

13.

Intro	Ginny opened the door for three of her mother's brothers.
neutral RC + because	She hated the uncle who worked at her mother's company because for a long time he had been trying to claim the most valuable family heirloom.
neutral RC + and so	She hated the uncle who worked at her mother's company and so for a long time he had been the focal point of her withering stares.
causal RC + because	She hated the uncle who had run over her dog because for a long time he had been trying to claim the most valuable family heirloom.
causal RC + and so	She hated the uncle who had run over her dog and so for a long time he had been the focal point of her withering stares.
Wrap-up	She tried to keep her composure while inviting everyone into the living room.

14.

Intro	My son's eighth birthday party was a complete disaster.
neutral RC + because	Early on, I punished the girl who was dropped off by her grandpa because viciously she tried to steal one of the presents.
neutral RC + and so	Early on, I punished the girl who was dropped off by her grandpa and so viciously she tried to lock herself and another girl in one of the bedrooms.
causal RC + because	Early on, I punished the girl who knocked over the punch bowl because viciously she tried to steal one of the presents.
causal RC + and so	Early on, I punished the girl who knocked over the punch bowl and so viciously she tried to lock herself and another girl in one of the bedrooms.
Wrap-up	Later, it turned out the bowling alley had no record of our reservation.

15.

Intro	We try our best to maintain a good relationship with our community.
neutral RC + because	We repeatedly thanked the man who spoke at the Council meeting because yesterday he told us about an amazing investment opportunity.
neutral RC + and so	We repeatedly thanked the man who spoke at the Council meeting and so yesterday he told us that he appreciated being acknowledged.
causal RC + because	We repeatedly thanked the man who helped clean our gutters because yesterday he told us about an amazing investment opportunity.
causal RC + and so	We repeatedly thanked the man who helped clean our gutters and so yesterday he told us that he appreciated being acknowledged.
Wrap-up	Being nice to other people can be really rewarding.

16.

Intro	Andy met a lot of new people at the business fair last month
neutral RC + because	He unabashedly admired the woman who manned the stall in the corner because evidently she had been giving out great advice to everyone at the fair.
neutral RC + and so	He unabashedly admired the woman who manned the stall in the corner and so evidently she had been a bit embarrassed by the flattery.
causal RC + because	He unabashedly admired the woman who was very successful in her trade because evidently she had been giving out great advice to everyone at the fair.
causal RC + and so	He unabashedly admired the woman who was very successful in her trade and so evidently she had been a bit embarrassed by the flattery.
Wrap-up	He tried to tone down his enthusiasm for the remainder of the day.

17.

Intro	This morning, Pauline caught the bus to work.
neutral RC + because	She comforted the boy who was sitting next to her because undoubtedly he was very upset about something.
neutral RC + and so	She comforted the boy who was sitting next to her and so undoubtedly he was very appreciative of her caretaking nature.
causal RC + because	She comforted the boy who had just lost his mother because undoubtedly he was very upset about it.
causal RC + and so	She comforted the boy who had just lost his mother and so undoubtedly he was very appreciative of her caretaking nature.
Wrap-up	She ended up getting off three stops past her destination.
Verification statement	*Pauline got off at the correct bus stop.*

18.

Intro	Bob was conducting interviews for the shop assistant vacancy.
neutral RC + because	He clearly pitied the woman who was the first to come in because the whole time she had been nervously chewing her hair.
neutral RC + and so	He clearly pitied the woman who was the first to come in and so the whole time she had been extremely uncomfortable.
causal RC + because	He clearly pitied the woman who had a terrible resume because the whole time she had been nervously chewing her hair.
causal RC + and so	He clearly pitied the woman who had a terrible resume and so the whole time she had been extremely uncomfortable.
Wrap-up	He would certainly pick another candidate.

19.

Intro	Chrissy got into a bit of a fight at a party.
neutral RC + because	She laughed at the guy who was standing by the drinks because for a while he had entertained middle-aged rich women for money.
neutral RC + and so	She laughed at the guy who was standing by the drinks and so for a while he had entertained the idea of throwing her in the pool.
causal RC + because	She laughed at the guy who had slipped on a puddle of beer because for a while he had entertained middle-aged rich women for money.
causal RC + and so	She laughed at the guy who had slipped on a puddle of beer and so for a while he had entertained the idea of throwing her in the pool.
Wrap-up	She tried to apologize by getting him a slice of pizza.

20.

Intro	Mrs. Thompson had many family members she saw regularly.
neutral RC + because	She often worried about the nephew who lived in the apartment below because frequently he would try to hide empty wine bottles when she came over unexpectedly.
neutral RC + and so	She often worried about the nephew who lived in the apartment below and so frequently he would try to reassure her that he was doing fine.
causal RC + because	She often worried about the nephew who lived in the apartment below her because frequently he would try to hide empty wine bottles when she came over unexpectedly.
causal RC + and so	She often worried about the nephew who had been in rehab several times and so frequently he would try to reassure her that he was doing fine.
Wrap-up	She was also concerned about her sick sister.

21.

Intro	Prof. Roberts was in the middle of a lecture on global politics.
neutral RC + because	He corrected the girl who sat in the front row because curiously she started to claim that World War II never actually happened.
neutral RC + and so	He corrected the girl who sat in the front row and so curiously she started to argue with him about the geography of Europe.
causal RC + because	He corrected the girl who thought Paris was a country because curiously she started to claim that World War II never actually happened.
causal RC + and so	He corrected the girl who thought Paris was a country and so curiously she started to argue with him about the geography of Europe.
Wrap-up	He told her they would continue the discussion after class.

22.

Intro	After work, Mia went to a pub with some colleagues.
neutral RC + because	She told off the businessman who was having a drink at the bar because obnoxiously he voiced his sexist opinions about women in business.
neutral RC + and so	She told off the businessman who was having a drink at the bar and so obnoxiously he voiced his objection to her hostile attitude.
causal RC + because	She told off the businessman who spilled a drink on her dress because obnoxiously he voiced his sexist opinions about women in business.
causal RC + and so	She told off the businessman who spilled a drink on her dress and so obnoxiously he voiced his objection to her hostile attitude.
Wrap-up	After a while, she left to catch the last train home.

23.

Intro	Kim watched a few kids while their parents were at a school meeting.
neutral RC + because	She rewarded the boy who has a large mole on his cheek because for half an hour he sat quietly drawing cartoons.
neutral RC + and so	She rewarded the boy who has a large mole on his cheek and so for half an hour he sat quietly enjoying the praise.
causal RC + because	She rewarded the boy who had helped set up the crafts table because for half an hour he sat quietly drawing cartoons.
causal RC + and so	She rewarded the boy who had helped set up the crafts table and so for half an hour he sat quietly enjoying the praise.
Wrap-up	Some of the other kids were chasing after a squirrel.

24.

Intro	Grace was in her final year of high school.
neutral RC + because	She completely idolized the guy who sat in front of her during Art because regularly he would take his grandma to her yoga class.
neutral RC + and so	She completely idolized the guy who sat in front of her during Art and so regularly he would take advantage of her.
causal RC + because	She completely idolized the guy who was the cutest member of the hockey team because regularly he would take his grandma to her yoga class.
causal RC + and so	She completely idolized the guy who was the cutest member of the hockey team and so regularly he would take advantage of her.
Wrap-up	Her only real friend was Glenn, the school band's triangle player.
Verification statement	*Grace is in her last year of high school.*

25.

Intro	Mr. Brown was teaching his weekly sculpture class.
neutral RC + because	He chastised the lady who was making a modernist cube because allegedly she stole the idea for her project from another classmate.
neutral RC + and so	He chastised the lady who was making a modernist cube and so allegedly she stole the most expensive sculpting tool in retaliation.
causal RC + because	He chastised the lady who had dropped her clay for the seventh time because allegedly she stole the idea for her project from another classmate.
causal RC + and so	He chastised the lady who had dropped her clay for the seventh time and so allegedly she stole the most expensive sculpting tool in retaliation.
Wrap-up	Class ended at 4PM sharp.

26.

Intro	Queen Wendelyn was addressing her Court.
neutral RC + because	She banished the knight who guarded the castle's main entrance because astonishingly he tried to poison her the day before.
neutral RC + and so	She banished the knight who guarded the castle's main entrance and so astonishingly he tried to draw his sword and attack her.
causal RC + because	She banished the knight who had recently let three prisoners escape because astonishingly he tried to poison her the day before.
causal RC + and so	She banished the knight who had recently let three prisoners escape and so astonishingly he tried to draw his sword and attack her.
Wrap-up	Later, she also reprimanded the court jester.

27.

Intro	Mr. Evans was having lunch at his favourite pub.
neutral RC + because	He respected the waitress who was serving his table because over the past year she had received two promotions and was now practically in charge.
neutral RC + and so	He respected the waitress who was serving his table and so over the past year she had received very generous tips whenever he visited.
causal RC + because	He respected the waitress who could carry the heaviest trays because over the past year she had received two promotions and was now practically in charge.
causal RC + and so	He respected the waitress who could carry the heaviest trays and so over the past year she had received very generous tips whenever he visited.
Wrap-up	When his steak arrived, it was perfectly medium-rare.
Verification statement	*Mr. Evans' steak was overcooked.*

28.

Intro	Right when the gardening crew was leaving, Lady Paulson noticed that her beloved flower patch had been completely ruined.
neutral RC + because	She blamed the gardener who was wearing dark green overalls because surely he was the one last seen near the flower patch.
neutral RC + and so	She blamed the gardener who was wearing dark green overalls and so surely he was the one most fervently denying having been near the flowers.
causal RC + because	She blamed the gardener who always had a careless attitude because surely he was the one last seen near the flower patch.
causal RC + and so	She blamed the gardener who always had a careless attitude and so surely he was the one most fervently denying having been near the flowers.
Wrap-up	The crew manager promised they would repair the damage.
Verification statement	*Lady Paulson noticed her orchard had been ruined.*

29.

Intro	Julie was a contestant in a national talent show.
neutral RC + because	She envied the singer who was standing on stage left because from the start he had been the public's favourite.
neutral RC + and so	She envied the singer who was standing on stage left and so from the start he had been avoiding her as much as possible.
causal RC + because	She envied the singer who was also a gifted guitar player because from the start he had been the public's favourite.
causal RC + and so	She envied the singer who was also a gifted guitar player and so from the start he had been avoiding her as much as possible.
Wrap-up	She was extremely nervous about next week's final.

30.

Intro	Mr. Lee was helping the golf team off the bus after the accident.
neutral RC + because	He carried the girl who had been in the back of the bus because obviously she was very badly hurt.
neutral RC + and so	He carried the girl who had been in the back of the bus and so obviously she was very grateful for his help.
causal RC + because	He carried the girl who had a huge gash on her leg because obviously she was very badly hurt.
causal RC + and so	He carried the girl who had a huge gash on her leg and so obviously she was very grateful for his help.
Wrap-up	Fortunately, it would later turn out that the cut had not severed any major arteries.

31.

Intro	Billy was in his first year of primary school.
neutral RC + because	He feared the teacher who supervised the playground because every day she would come up to him and point out something he was doing wrong.
neutral RC + and so	He feared the teacher who supervised the playground and so every day she would come up to him and try to put him at ease.
causal RC + because	He feared the teacher who often yelled at students because every day she would come up to him and point out something he was doing wrong.
causal RC + and so	He feared the teacher who often yelled at students and so every day she would come up to him and try to put him at ease.
Wrap-up	He liked the PE teacher much better.

32.

Intro	Ava had to attend a symposium on life after high school.
neutral RC + because	She loudly mocked the speaker who presented before the break because right away he started to advocate expressing one's feelings using a xylophone.
neutral RC + and so	She loudly mocked the speaker who presented before the break and so right away he started to call her out on it.
causal RC + because	She loudly mocked the speaker who tripped as he walked on stage because right away he started to advocate expressing one's feelings by using a xylophone.
causal RC + and so	She loudly mocked the speaker who tripped as he walked on stage and so right away he started to call her out on it.
Wrap-up	The rest of the day was fairly disastrous also.