

Discourse Cues to Ambiguity Resolution: Evidence From “Do It” Comprehension

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In sentences such as *Sam borrowed a jigsaw puzzle, and he did it while everyone else was out*, the “do it” expression can take its meaning from the entire preceding verb phrase (= *borrowed the jigsaw puzzle*) or from just the noun phrase (= *did the jigsaw puzzle*). We examine how the choice of verbal or nominal interpretation is influenced by changes in discourse structure, and in doing so, illustrate those processes that guide discourse comprehension more generally. With 3 manipulations, we show how “do it” interpretation is influenced by the nature of the following subordinating conjunct (*while* vs. *because*), the preceding coordinating connective (full stop vs. *and*), and the presence or absence of a pronominal agent. With these results, we argue that readers take cues from the amount of overlapping discourse structure in an antecedent and anaphor clause, and from a consideration of how events in a discourse can be causally related.

When understanding written or spoken discourse, language users combine linguistic elements to make successively larger components of meaning. At one level of processing, the information expressed in phrases and clauses is assembled into higher order discourse units, and it is known that readers and listeners progress through a narrative with expectations that guide their comprehension (e.g., Duffy, 1986; Myers 1990; van den Broek, 1990). The aim of this article is to investigate

three such principled expectations, and we base our research on evidence from the comprehension of anaphors (i.e., words or phrases that specify the same discourse entity as preceding words or phrases in the discourse). We ask first whether the interpretation of an ambiguous “do it” anaphor can be influenced by the desire to establish certain types of coherence relations between the events described in a narrative. We also question whether readers take cues, during “do it” comprehension, from the degree of structural overlap between the clauses in a discourse. Finally, we examine what “do it” comprehension can tell us about the types of expectations that are generated across clausal boundaries.

The “do it” anaphor is one member of a class of anaphors whose common characteristic is that a repeated verbal action is not explicitly expressed. Other members of this class include verb phrase ellipsis (VPE), gapping, pseudogapping, sluicing, stripping, “do so” anaphora, and “do that” anaphora (see Garnham, 2001, ch. 4; Johnson, 1996). An example of the “do it” anaphor is underlined in Example 1.

- (1) John swam the English Channel and he did it in under 12 hours.

In Example 1 the contents of the second clause can be paraphrased as *John swam the English Channel in under 12 hours*, with “do it” specifying the same discourse entity as the preceding verb phrase (VP). Unlike other “verbal anaphors,” however, “do it” can have an alternative interpretation, shown in the following example.

- (2) Sam borrowed a jigsaw puzzle, and he did it while the others were out.

In Example 2 “do it” may take its meaning from the entire preceding VP, giving the *verbal interpretation* (*did it = borrowed the jigsaw puzzle*) or, alternatively, the paraphrase of “do it” can retain the main verb *do*, and refer back to only the preceding simple noun phrase (NP). In this latter case, the expression takes a *nominal interpretation* (*did it = did the jigsaw puzzle*). This ambiguity between verbal and nominal “do it” has not been previously described, and is possible only when the expression is preceded by what we term a “do-complement NP” (e.g., *a jigsaw puzzle, a crossword, the washing up*; i.e., an NP that can serve as the direct object of *do*). According to one linguistic analysis, the “do it” expression consists of a main verb *do* (Miller, 1990; Schachter, 1977) and an NP pronoun whose referent is either a simple NP (e.g., *a jigsaw puzzle*) as in the nominal interpretation, or a deverbalized NP [e.g., (*that thing that is*) *the borrowing of a jigsaw puzzle*] for the verbal interpretation (Simner, 2001). In this article, we investigate three ways in which text-oriented expectations might predispose readers to interpret “do it” either nominally or verbally, and use our hypotheses to show how readers exploit discourse-level cues to interpret ambiguous texts.

COHERENCE RELATIONS AND ANAPHOR COMPREHENSION

It is known that readers strive to establish coherence in a discourse, and make certain inferences in order to create this coherence (e.g., Haviland & Clark, 1974; van den Broek, 1994; Vonk & Noordman, 1990). A number of different coherence relationships have been identified, each serving to bind together the narrative by connecting the individual events it describes (Halliday & Hasan, 1976; Hobbs, 1979; see Hovy, 1993 for overview; Kehler, 2000). One important type of relationship is that of “cause-effect” (i.e., related to either cause or consequence; e.g., Kehler, 2000). Myers (1990) claimed that when readers encounter an event in a discourse, they make active efforts to locate a cause or consequence to which it can be connected (see also Duffy, 1986; van den Broek, 1990). Majid, Sanford, and Pickering (2002) suggested that readers progress through a text anticipating, specifically, upcoming causal links, although Arnold (2001), Stevenson, Crawley, and Kleinman (1994), and van den Broek, Linzie, Fletcher, and Marsolek (2000) argued that the bias is for consequences. More broadly, however, there is overall consensus that readers strive to relate the events in a discourse as causes or consequences, and we suggest here that it is precisely this search for cause-effect coherence that may bias the interpretation of an ambiguous “do it” expression.

Evidence for the influence of discourse relations on anaphoric constructions comes from Kehler (2000). Kehler illustrated that VPE anaphors are licensed, in part, by the type of discourse relation they hold with their antecedent. In particular, the range of environments that permits a VPE anaphor is broader when the antecedent and anaphor are in a cause-effect relationship (see Kehler, 2000 for details). Like Kehler before us, we investigate how discourse relations can influence anaphoric processing. Nonetheless, where Kehler (2000) illustrated their influence on the *distribution* of anaphors, we show how they might also influence an anaphor’s *interpretation*.

In our study, participants read passages in which a “do it” expression was immediately followed by one of two subordinating conjunctions. The type of conjunct was systematically varied between *because* and a control conjunct (*while*). The interpretation that readers generated was assessed by asking them to paraphrase the meaning of the “do it” expression. We hypothesize that *because* will generate more verbal “do it” interpretations than *while*, because a verbal interpretation in the former permits an explicit causality dependency for every event in the passage (see below), which in turn allows the reader to understand the text with the maximum degree of cause-effect coherence. Note then that our arguments are not based on whether readers have any particular preference for either a causal or consequential continuation, but are simply based on the assumption that readers will prefer to make some type of cause-effect link between the events described in a text.

(1990) referred to as weak “enablement” dependencies (where, e.g., borrowing the jigsaw puzzle “enables” Sam to do the jigsaw puzzle). However, it is equally possible that readers will generate no cause-effect relationship at all, choosing instead, say, a “contiguity” relationship (as when two events take place in temporal sequence) when “do it” is nominal, or a “simple elaboration” relationship when it is verbal (i.e., where the details of the “borrowing” event are simply “elaborated on” by adding a location/time adverbial). Our argument, then, is that the conjunct *while* either disfavors a cause-effect relation, or allows only a weak (enablement-type) causality relationship to be generated. Given this, there is no clear advantage toward ensuring a firm cause-effect dependency for every event in the passage by selecting one interpretation of “do it” over another, and so, we predict a reduced proportion of verbal “do it” when the conjunct is *while* (compared to *because*).

OVERLAPPING FEATURES AND THE COMPREHENSION OF ANAPHORA

We turn now to our second test of discourse-level influences on “do it” comprehension. The hypothesis we test here is that the overlap in discourse structure between a source clause and a “do it” expression can influence the choice of interpretation assigned to “do it.” Smyth (1994; also Chambers & Smyth, 1998; Sheldon, 1974) illustrated a preference for an ambiguous pronoun to be interpreted as referring to an antecedent in a syntactically parallel position (e.g., *John tickled Paul and Mary kissed him*; where *him* is preferentially “Paul”). Smyth (1994) found that this “parallel function” effect was heightened when the anaphor was embedded in a context that shared the same overall structural composition as that containing the antecedent candidates. In other words, the greater the structural overlap between two stretches of discourse, the greater the parallelism at the level of interpretation. Given this relationship between structural and semantic parallelism in anaphor comprehension, we investigated whether any similar type of effect could be seen to play a role in “do it” processing. Consider then the following three passages, with respect to the degree of overlap in discourse composition between the source clause and the anaphor.

(4) Sam borrowed a jigsaw puzzle	{#	AGENT	ACTION}
(a) , and did it...	{--	--	ACTION}
(b) , and he did it...	{--	AGENT	ACTION}
(c) . He did it...	{#	AGENT	ACTION}

We can analyze the source clause as containing a left-edge sentence boundary (#), followed by an agent and an action. The three continuations vary in the extent to

which these three features are repeated. In 4c all three are present, but in 4b the sentence boundary is absent, and in 4a both the sentence boundary and the immediately preceding agent are omitted. Of interest, therefore, is the extent to which this factor of discourse composition overlap (low, 4a; medium, 4b; high, 4c) can influence the choice of interpretation assigned to the “do it” expression.

We hypothesize that when two consecutive expressions share parallel discourse compositions, they will be more likely to be interpreted as semantically parallel. However, semantic parallelism can be viewed at different levels of analysis. In a coarse-grained analysis, we can consider the “do it” anaphor as a VP that serves to describe some event X. Because the verbal “do it” interpretation (e.g., *did it = borrowed the jigsaw puzzle*) is one that repeats the event described in the source clause, we predict that this interpretation would become increasingly favored as the degree of structural overlap between source clause and anaphor expression is increased, as when moving from 4a to 4b to 4c.

Alternatively, the effect of parallel composition may have a more fine-grained effect on semantic interpretation. Smyth (1994) found that two clauses with parallel structure encourage NP pronouns to be resolved to their syntactic counterparts in the preceding clause (e.g., direct object pronouns to direct object antecedents). The “do it” expression itself contains a direct object NP pronoun. This pronoun can be resolved either to a preceding do-complement NP (for the nominal interpretation) or to a deverbalized NP (for the verbal interpretation). Crucially, because the do-complement NP in the source clause resides in direct object position, the fine-grained level of parallel interpretation would treat this NP as the preferred antecedent. In this way, if structural overlap encourages a fine-grained form of parallel function, we might expect an increase in nominal “do it” interpretations as discourse overlap increases, from 4a to 4b to 4c.

In summary, our two hypotheses make the following predictions. If parallelism in discourse composition encourages the reader to believe that a “do it” expression describes the same overall event as that described in the previous clause, verbal “do it” interpretations will increase from 4a to 4b to 4c. We refer to this as the “coarse-grained parallelism hypothesis.” However, if the overlap in composition serves to associate the direct object pronoun in “do it” with the direct object in the preceding context (which we refer to as the “fine-grained parallelism hypothesis”), we predict an increase in nominal interpretations.

DO SENTENCE BOUNDARIES PRECIPITATE EXPECTATIONS OF CAUSE?

Stevenson et al. (1994) claimed that the interpretation of an ambiguous anaphor can be influenced by the type of connective that separates the anaphor from its antecedent. The arguments of Stevenson et al. are based on the finding that when

readers encounter stimulus-experiencer verbs (e.g., *John bored Paul*), their sentence completions tend to make reference to different participants depending on whether or not the preceding context ends with a full stop. When a full stop is present, a subsequent ambiguous subject pronoun will tend to be interpreted as the stimulus (*John*); when the full stop is absent, it will tend to be the experiencer (*Paul*). Since Stevenson et al. (1994) argued that the stimulus was associated with the initiating conditions of a stimulus-experiencer event, they claimed that the focus on the stimulus following a full stop gave evidence that a sentence boundary precipitates a focus on causes. Nonetheless, other than their evidence from thematic role preferences, there was no independent test of the relationship between full stops and causality.

In effect then, the question of whether sentence boundaries precipitate causes (independently of thematic role preferences) remains unresolved. However, the materials of our study allow us to test this. Consider, then, 4c as seen earlier. If Stevenson et al. (1994) were correct, readers would tend to cross the sentence boundary with the implicit question: *Why did Sam borrow a jigsaw puzzle?* Note that a nominal “do it” interpretation (*did the jigsaw puzzle*) could provide a consequence or contiguity continuation of the previous narrative, whereas a verbal interpretation could potentially provide a *cause* (e.g., *He borrowed the jigsaw puzzle because he was bored*; or, *He borrowed the jigsaw puzzle to give himself something to do later that afternoon*). In this way, any cause-expectancy that may be invoked across a sentence boundary could bias readers’ initial “do it” interpretation in a verbal direction, since this may potentially supply the cause, rather than the consequence, of the previous event.¹

Thus far, the “sentence boundary bias” makes partially the same prediction as our coarse-grained hypothesis of discourse composition overlap, for example, an increase in verbal “do it” from 4b to 4c. To distinguish between accounts, we made use of the additional condition in our study. If, as Stevenson et al. (1994) claimed, crossing the sentence boundary leads the reader to expect an upcoming cause (hence: *He did it (= borrowed a jigsaw) + REASON*), the subsequent encounter of a *because* conjunct would fit exactly with this expectation, since the interpretation generated would become: *He did it (= borrowed a jigsaw) because...* In other words, if some sentence boundary causality bias exists, we expect not only an increase in verbal “do it” between conditions 4b and 4c, but, also, a greater increase when the conjunct is *because* (compared to *while*). The predictions of our study can be summarized as follows, with reference to the example of our materials shown below.

¹The nominal interpretation (*did the jigsaw puzzle*) might instead provide the cause of the previous event in sentences such as: *Sam borrowed the jigsaw puzzle. He did the jigsaw puzzle every Thursday, and so wasn't going to miss out today!* However, we consider this type of sentence to be an unusual case, since a prerequisite of doing a jigsaw puzzle is usually the obtaining of the jigsaw puzzle, and not vice versa.

(5)

- (a) Sam borrowed a jigsaw puzzle, and did it because/while everyone else was out.
- (b) Sam borrowed a jigsaw puzzle, and he did it because/while everyone else was out.
- (c) Sam borrowed a jigsaw puzzle. He did it because/while everyone else was out.

First, we predict that in all three versions of the passage, Examples 5a through 5c the conjunct *because* will give rise to a higher proportion of verbal “do it” interpretations than *while*, as a result of the reader’s desire to create maximum cause-effect coherence. Secondly, if readers take cues from the overlap in discourse structure to generate coarse-grained overlapping semantic representations for two consecutive pieces of discourse, there should be an increase in verbal interpretations as the structural overlap increases from 5a to 5b to 5c. An increase in verbal interpretations is also predicted between 5b and 5c if a sentence boundary introduces the expectation of an upcoming cause (following Stevenson et al., 1994). In this case, however, we additionally expect the verbal bias with *because* to be significantly larger when a sentence boundary is present, as in 5c. Finally, if the increased overlap in discourse composition from 5a to 5b to 5c encourages some more fine-grained form of parallel function effect, we predict an increase in nominal (rather than verbal) interpretations across the three conditions.

METHOD

Participants

Sixty-six members of the University of Sussex and University of Edinburgh were paid £3.50 to participate in this study. All were native speakers of English, and none was dyslexic.

Items

Six versions of 22 items were constructed based on the manipulations described above, see Examples 5a through 5c. Each item contained a do-complement NP and a subsequent “do it” expression. The “do it” expression was followed by either *because* or *while*, and was separated from its antecedent by either the presence/absence of a pronominal agent, and either a full stop or the conjunct *and*, see 5a through 5c previously. A test-statement was constructed for each item, to elicit the participant’s paraphrase of the previously read “do it” expression. The test-statement consisted of a fragment derived from the passage, stopping just before the “do it” expression; see Example 6 and Appendix for a complete list of items.

(6) Because/while everyone else was out, Sam _____.

The targets were counterbalanced into 6 lists, each containing 22 critical items (11 in each condition of *because* vs. *while*, and exactly one version of each item). Lists 1 and 2 contained items of the type shown in 5a above, while Lists 3 and 4 contained those similar to 5b, and Lists 5 and 6 contained those of the type in 5c.

Each participant additionally saw 28 filler items containing a range of anaphoric devices, to obscure the “do it” construction under investigation. Approximately half had test-statements that probed the meaning of an anaphor, and half probed some other element in the passage. The fillers were identical in each counterbalanced list, except that the discourse composition of the fillers was altered slightly to reflect the changes in discourse composition between lists. We did this by increasing the number of full stops in Lists 5/6 compared to Lists 1/2 and 3/4, and by increasing the number of explicit pronominal subjects in Lists 3/4 and 5/6 compared to List 1/2. Fillers were identical across conditions other than this manipulation, which served to further obscure the target items among the distractors.

Pretest

The items in this study were pretested to ensure that they were matched for plausibility. For each of the 22 items, the “do it” expression was rewritten as an expanded phrase to explicitly express either the nominal or verbal interpretation of the anaphor, and with either of the two conjuncts, see Example 7 next.

- | | | |
|-----|---|----------------------------|
| (7) | | |
| (a) | Sam borrowed a jigsaw puzzle while the others were out. | [VERBAL; <u>while</u>] |
| (b) | Sam borrowed a jigsaw puzzle because the others were out. | [VERBAL; <u>because</u>] |
| (c) | Sam did a jigsaw puzzle while the others were out. | [NOMINAL; <u>while</u>] |
| (d) | Sam did a jigsaw puzzle because the others were out. | [NOMINAL; <u>because</u>] |

The rewritten passages were counterbalanced into four lists and placed among 44 fillers in a random sequence. Half the fillers expressed pragmatically likely events, and half, unlikely events. (cf. *Steve bought a CD while his girlfriend was clothes-shopping* vs. *Martin wore purple trousers because his dog was a collie*). Twenty pretest participants were assigned to one of four groups, and asked to rate each passage by placing a cross on a scaled line, from 1 (*makes no sense*) to 7 (*makes complete sense*). The mean pragmatic acceptability scores were: verbal “do it” + *while* = 6.0; verbal “do it” + *because* = 5.7; nominal “do it” + *while* = 6.3; nominal “do it” + *because* = 5.7. Results of two-factor analyses of variance (ANOVAs) treating participants and items as random factors indicated that both

interpretations (nominal and verbal) were equally plausible [$F_1(1, 19) < 1$; $F_2(1, 21) = 1.11, p > .3$]. Passages containing *while* were judged to be slightly more acceptable than those containing *because* [$F_1(1, 19) = 4.85, p < .05$; $F_2(1, 21) = 5.09, p < .04$]. Of crucial importance, however, is that there was no interaction of the two factors [$F_1(1, 19) = 1.39, p > .25$; $F_2(1, 21) < .1$]. In other words, the nominal and verbal analyses were equally plausible for both *because* and *while*.

Procedure

Eleven participants saw each of the six counterbalanced lists. The materials were presented in a randomized order, in a booklet with approximately five passages per page and the instructions written on the front. Participants were required to read the passages carefully and to fill in the missing words from the paraphrase, in full (i.e., not to simply repeat the anaphor). This was achieved by asking them to “reiterate the missing words in full, as if you were repeating the information for someone who had not read the passage.” They were also told that in any case where they could see more than one possible answer, they should write down a response that corresponded to their initial understanding. Participants were tested individually, and were given as much time as they needed to complete the task. On average, this took approximately 30 min.

RESULTS

Each of the 1,452 responses generated was categorized as either a verbal or a nominal interpretation of “do it.” In the majority of cases, a verbal interpretation was one where the previous verb had been explicitly repeated in the participant’s response (e.g., *did it* = “borrowed a jigsaw puzzle”). Occasionally, however, participants gave a paraphrase (e.g., in *Flora cast a worried eye over the washing up, and she did it...*, the “do it” clause was interpreted verbally as “Flora was worried about the washing up”), but in all cases the verbal and nominal categorizations were clearly distinguishable (cf. the nominal interpretation: “Flora did the washing up” or “Flora washed up”). The total number of verbal responses in each condition was converted to a mean per participant, and the corresponding proportions are shown in Figure 1.

Two-factor ANOVAs were performed, with conjunct type (*because* vs. *while*) as a within-subjects–within-items factor, and discourse composition overlap (low vs. medium vs. high) as a between-subjects–within-items factor. The overall mean number of verbal interpretations was higher for the conjunct *because* (6.58) than for the conjunct *while* (4.59): $F_1(1, 63) = 69.01, p < .001$; $F_1(1, 21) = 13.99, p < .01$. There was a main effect, also, of discourse composition overlap (low = 3.57; medium = 5.53; high = 7.66): $F_1(2, 63) = 14.66, p < .001$; $F_2(2, 42) = 75.58, p < .001$. Planned comparisons revealed that the high overlap condition generated

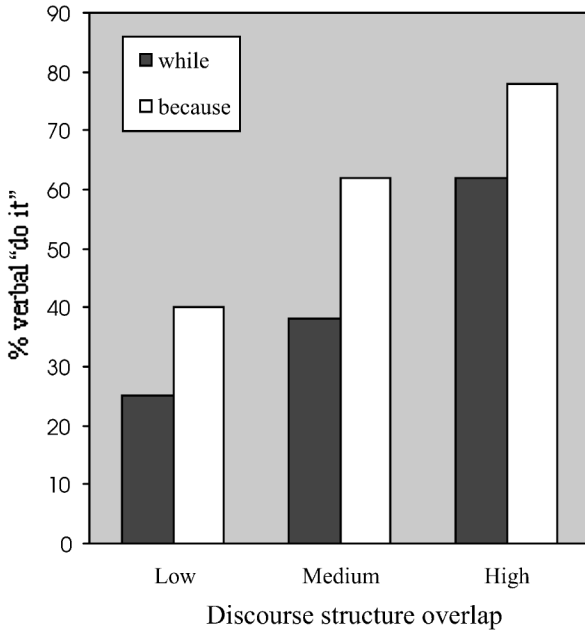


FIGURE 1 Percentage (%) of verbal “do it” interpretations, given subordinating conjuncts (*because* vs. *while*) and discourse structure overlaps (low, medium, high).

significantly more verbal interpretations than the medium and low overlap conditions [$F_1(1, 63) = 22.72, p < .001$; $F_2(1, 21) = 96.65, p < .001$], and that the medium overlap condition in turn generated more verbal interpretations than the low overlap condition [$F_1(1, 63) = 6.62, p < .02$; $F_2(1, 21) = 43.58, p < .001$]. Finally, there was no conjunct type \times discourse composition overlap interaction [$F_1(2, 63) = 1.69, p < .2$; $F_2 < 1$] suggesting that the size of the subordinating conjunct effect was the same across all three levels of discourse composition.

DISCUSSION

The experimental passages contained a “do it” expression that was ambiguous between a verbal and nominal interpretation (cf. *borrowed the jigsaw puzzle* vs. *did the jigsaw puzzle*), and the manipulations in our study generated the following findings. When “do it” is followed by the subordinating conjunct *because*, a higher proportion of verbal interpretations are generated compared to when the conjunct is *while*. The proportion of verbal interpretations of “do it” also increases when both the antecedent and anaphor are accompanied by a local NP agent. It increases also when both anaphor and antecedent are found to the right of a sentence

boundary. Finally, the presence of a sentence boundary between a “do it” expression and its antecedent does not affect the size of the advantage for verbal interpretations afforded by *because* over *while*.

The pretest of our materials suggests that these differences could not have arisen from considerations of pragmatic naturalness, since the events described by “do it” in our materials were equally plausible for both the nominal and verbal interpretations, with either conjunct. Instead, we have provided evidence for a model of text comprehension in which readers use discourse-level cues in order to guide their comprehension of an ambiguous text. We have attributed the subordinating conjunction effect to the reader’s desire to establish a certain type of coherence relation within a discourse. A verbal “do it” interpretation in combination with *because* would permit an explicit cause-effect dependency for every event in the passage. This, in turn, would allow the reader to achieve an implicit comprehension goal, by understanding the passage with the maximum degree of cause-effect coherence (Vonk & Noordman, 1990). In addition, our results argue for the influence of discourse-level cues at a more structural level. We attribute the two effects stemming from context *preceding* the anaphor (i.e., presence/absence of preceding agent; full stop vs. *and*) to a single source, which we claim is the degree of discourse composition that co-occurs between the source clause and the anaphor. We argue that a repetition of the discourse structure between the source clause and anaphor leads readers to interpret “do it” verbally, simply because the verbal interpretation represents a repetition of the event expressed in the source clause. In other words, an overlap in discourse composition between “do it” and a preceding clause encourages some type of coarse-grained semantic parallelism between the two events described in the passage.

Our findings argue against a more fine-grained type of parallelism effect, since there was no evidence that an ambiguous direct object pronoun will be preferentially resolved to a preceding direct object as structural parallelism increases. This type of effect had been found for pronouns when two potential NP antecedent candidates exist in the preceding context (Chambers & Smyth, 1998; Sheldon, 1974; Smyth, 1994). In “do it” anaphora, however, the situation is somewhat different. The ambiguity here is between an interpretation where the verb either does, or does not, form part of the antecedent expression. This difference in the nature of the two alternative antecedents may account for why the fine-grained parallel function effect (which selects between two NP antecedents for an NP pronoun) does not arise.

Stevenson et al. (1994) suggested that expectations of causation are generated across a sentence boundary, such that readers expect an upcoming sentence to provide the cause of the previous one. However, our data do not support this. We suggest that any expectation of causality across a sentence boundary should have been more strongly satisfied when the following sentence contained a *because* conjunct and the “do it” expression was interpreted verbally (compared to when it contained *while*). If the hypothesis of Stevenson et al. (1994) was correct, then

including the sentence boundary condition (5c) should have increased the verbal “do it” preference for *because* compared to *while*. In contrast to this, no such increase was found.

Investigations of discourse comprehension may, at times, fail to isolate the potentially numerous effects that may individually conspire to bias readers’ interpretations. Indeed, Simner (2001) has identified additional factors that can influence the interpretation of a “do it” expression. Native speakers were asked to generate “do-affinity ratings,” which indicate the strength of the association between an NP and the verb *do*. Do-affinity scores significantly correlate with (a) offline interpretations of a subsequent “do it” expression (i.e., the higher the do-affinity, the more nominal interpretations generated), and (b) online reading times for the “do it” clause (i.e., the higher the do-affinity of a given NP, the faster the reading time). Given that language processing is known to proceed incrementally (e.g., Sedivy, Tanenhaus, Chambers, & Carlson, 1999; Traxler, Bybee, & Pickering, 1997), it is likely that such lexically constrained influences could come into play relatively early (as readers encounter “do it”). Nonetheless, any early commitment to an interpretation (from lexical or structural considerations) would not rule out the potential influence of subsequent context. For example, even if a nominal “do it” is strongly biased (e.g., *Sam borrowed a jigsaw puzzle and did it while...*), readers may still switch their interpretation should subsequent context favor the alternative meaning (e.g., ... *John was borrowing a jigsaw puzzle too*), in just the same way as they can change their initial choice of meaning for an ambiguous word (e.g., Rayner & Frazier, 1989) or a syntactic analysis (e.g., Frazier & Rayner, 1982). Obviously, this question can only be addressed using online methods (such as eye-tracking). These online tasks might also avoid the use of a test question, which, in this study, may have forced readers to interpret the anaphor when they might otherwise have not done so.

Our study of “do it” anaphora contributes to the investigation of language processing more generally. First, our findings lend support to previous claims (e.g., Haviland & Clark, 1974; van den Broek, 1994) that readers strive to causally relate the events in a discourse. We do not wish to claim that every sentence generated must necessarily describe causal events explicitly. Indeed, Simner and Pickering (2003) illustrated that readers make careful assessments of whether sufficient causal information has already been given (implicitly, by inference) before seeking additional causal details. Nonetheless, the findings in this study highlight the role that the search for causal information might play in the comprehension of ambiguous material. Secondly, our findings add to previous work that has shown how parallelism at one level of processing can encourage parallelism at another. Cleland and Pickering (2003) have shown that dialogue participants are likely to mirror each other’s syntax. Crucially, this syntactic parallelism effect is greater when the two speakers are describing semantic relatives (e.g., Speaker A – sheep; Speaker B – goats) compared to when they are describing semantically unrelated

nouns (e.g., sheep and knives). In a similar (but converse) way, we show that parallelism in the structural form of consecutive utterances can encourage parallelism at the level of meaning.

Given that the full range of influences on “do it” comprehension is not known, we did not base any strong conclusions on the relative proportion of nominal and verbal interpretations generated *within* any given experimental condition. Instead, we took our comparisons *across* conditions where the particular influence of any given feature could be isolated. We found that an ambiguous “do it” expression will generate more verbal interpretations if the following subordinating conjunct is *because* compared to *while*, if the preceding coordinating connective is a full stop compared to *and*, and if “do it” is immediately preceded by a pronominal agent. A further examination of individual discourse effects might help us to better understand how these influences could interact to produce the reader’s final interpretation.

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APPENDIX

The materials are shown as they appeared in the high overlap conditions. Each item consists of a two-sentence passage and a test statement. In the medium overlap conditions, the full stop separating the first and second sentence of each passage is replaced by the conjunct *and*, and in the low overlap conditions, the pronominal subject immediately preceding the “do it” expression is additionally omitted.

1. Jamie contemplated an Irish jig. He did it because/while the others were stood around looking bored.
Because/while the others were stood around looking bored, Jamie...
2. Norma signed up for karate. She did it because/while her friends were away on holiday for the summer.
Because/while her friends were away on holiday for the summer, Norma...
3. Jenny warmed up for a triple back-flip. She did it because/while her gym coach wasn't watching.
Because/while her gym coach wasn't watching, Jenny...
4. Loren suggested a painting for the bedroom. She did it because/while her housemate was still being indecisive about what would suit the space.
Because/while her housemate was still being indecisive about what would suit the space, Loren...
5. John booked his driving test. He did it because/while his best friend was moving to Scotland.
Because/while his best friend was moving to Scotland, John...
6. Patsy bought a crossword. She did it because/while everyone else was out.
Because/while everyone else was out, Patsy...
7. Kerry signed up for Italian. She did it because/while her brother was taking French lessons.
Because/while her brother was taking French lessons, Kerry...
8. Sid boasted about his one-handed cartwheel. He did it because/while the girls were coming in.
Because/while the girls were coming in, Sid...
9. Denny considered a back-flip from the top board. He did it because/while his fans cheered madly.
Because/while his fans cheered madly, Denny...
10. Rosie promised them an easy card trick to start. She did it because/while the crowd was still settling down.
Because/while the crowd was still settling down, Rosie...
11. Sam borrowed a jigsaw puzzle. He did it because/while everyone was away on holiday.
Because/while everyone was away on holiday, Sam...
12. Stuart applied for a part-time PhD at Surrey University. He did it because/while he was working in McDonalds.
Because/while he was working in McDonalds, Stuart...
13. Janet organized a parachute jump. She did it because/while her friends were still betting she wasn't brave enough.
Because/while her friends were still betting she wasn't brave enough, Janet...

14. Kelly planned the housework. She did it because/while her parents were driving down to visit her.
Because/while her parents were driving down to visit her, Kelly...
15. Flora cast a worried eye over the washing up. She did it because/while a mass of flies were gathering around her.
Because/while a mass of flies were gathering around her, Flora...
16. Irene sorted out the laundry for the washing machine. She did it because/while her husband was packing to go abroad.
Because/while her husband was packing to go abroad, Irene...
17. Timmy won the crowd over with his impersonation of Elvis. He did it because/while his sister was leading the cheering.
Because/while his sister was leading the cheering, Timmy...
18. Basil took charge of the gardening. He did it because/while the owners were away in Turkey.
Because/while the owners were away in Turkey, Basil...
19. Agnes suggested a piece of Mozart on the piano. She did it because/while the others were saying how much they liked classical music.
Because/while the others were saying how much they liked classical music, Agnes...
20. Betsy took her homework to the kitchen. She did it because/while her mother quietly encouraged her from the sitting room.
Because/while her mother quietly encouraged her from the sitting room, Betsy...
21. Lizzy signed up for aerobics. She did it because/while she was training for a marathon.
Because/while she was training for a marathon, Lizzy...
22. Micky complained about the ironing. He did it because/while everyone else just lazed around.
Because/while everyone else just lazed around, Micky...