University of Massachusetts Occasional Papers in Linguistics

Volume 22 *UMOP 19: Linguistics in the Laboratory* | Article 11

1996

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1 Introduction

In the last two and half decades, a great deal of research has been conducted on the topic of human sentence processing. During this time, there have been numerous attempts to characterize of the Human Sentence Processing Mechanism (HSPM). Several important issues have arisen. One important issue is whether the HSPM constructs a single structural analysis or multiple structural analyses at points of syntactic ambiguity. A related issue is how structural analyses are generated during sentence processing. The present paper addresses these issues, referring to two competing approaches to sentence processing, and testing the predictions of each approach in two on-line reading experiments.

The two broadly defined approaches differ in the role that lexical information plays during initial sentence analysis. Lexical information includes information about the structural possibilities or subcategorization frames associated with a word. For example, many verbs can potentially occur with several types of structures. For example, the verb 'expect' can occur with three structure types: noun phrase complements, tensed sentence complements, and tenseless sentence complements as shown in (1a-c).

(1) a. Bill expected the phone call.
b. Bill expected that the phone call would come at 3 o'clock.
c. Bill expected the phone call to upset his wife.

A verb may subcategorize for several types of structure. One processing implication is that readers may use verb subcategorization information predictively in the analysis of words and phrases that follow the verb. Although this is a possibility that has been investigated by several researchers (Clifton, Frazier, & Connine, 1984; Ford, Bresnan, & Kaplan, 1982; Mitchell & Holmes, 1985), this possibility remains a hotly debated topic. Current models of sentence processing either assume that lexical information "guides" the processing of following words and phrases, or they assume that lexical information is used in a more limited role by the sentence processor.

The Garden Path Model of sentence processing is a model that assumes the latter. The model as stated by Frazier (1978) and Frazier and Fodor (1979) did not address the role that nonsyntactic information might play in determining a sentence analysis. The model assumes that the sentence processor pursues a single structural analysis and that this structural analysis is maintained until the reader encounters information that signals that an error has been made. In postulating the initial

analysis of a word in a sentence, the sentence processor applies the parsing principles Minimal Attachment and Late Closure. Minimal Attachment dictates that the analysis requiring the simplest syntactic structure will be postulated. Late Closure dictates that when multiple analyses involve the same syntactic complexity, the analysis involving the most recent part of the sentence will be postulated.

A subsequent revision of the model, referred to as the Lexical Filtering Proposal, suggests that nonsyntactic information can be used to evaluate the initial analysis and to signal that a disfavored analysis has been postulated (Adams, Clifton, & Mitchell, ms; Ferreira & Henderson, 1991; Frazier, 1987). Such nonsyntactic information may include information about the plausibility of analysis and also lexical information about the structural preferences of verbs.

The Garden Path model and the Lexical Filtering proposal would limit the role that lexical information can play in determining the analysis of a syntactically ambiguous phrase. Either lexical information would not be used until the sentence processor has information that an error has been made, as suggested by the Garden Path Model or lexical information could be used after an initial analysis to signal that an disfavored analysis has been selected.

Both of these contrast sharply with models that suggest the sentence processor relies on lexical information in determining sentence analysis. One such model is Constraint Satisfaction developed by researchers at the University of Southern California and the University of Rochester (MacDonald, 1993; MacDonald, Perlmutter, & Seidenberg, 1994; Trueswell & Tannenhaus, 1994; Trueswell, Tannenhaus, & Garnsey, 1992; Trueswell, Tannenhaus, & Kello, 1993). This model assumes that verb subcategorization information as well as other sources of non-syntactic information can be used by the sentence processor in determining an initial analysis of a word in a sentence. The model also assumes that the sentence processor can generate and maintain multiple structural analyses of a given sentence. MacDonald's (1993) Partial Activation Hypothesis (PAH) explains how verb subcategorization possibilities are used to generate parallel analyses during sentence processing. The PAH assumes that when a word is processed, all of its subcategorization possibilities are activated in parallel, according to their relative frequency of usage. The activation levels of the subcategorizations can be influenced by the prior and subsequent sentence context. When the sentence processor encounters good evidence for a particular analysis, alternative analyses may be inhibited.[1]

Empirical evidence can be found supporting both sides of the debate. There have been several investigations which have shown that nonsyntactic information, such as lexical or semantic information from the prior sentence context enabled readers to avoid a misanalysis, i.e., an initial commitment to an analysis that proved subsequently to be incorrect (Holmes, Stowe, & Cupples, 1989; Stowe, 1989; Trueswell et al, 1992; Trueswell et al, 1993; Sedivy & Tannenhaus, 1994; Spivey-Knowlton & Tannenhaus, 1994). There have been notable rebuttals from advocates

[1] The Constraint Satisfaction Approach is not the only sentence processing approach that assumes that subcategorization information plays an important role in determining an initial analysis of a word. Models that assume that the sentence processor is closely tied to the grammar of the language in question also emphasize the role that verb information plays in sentence processing. These models include the models proposed by Abney (1987; 1989), Pritchett (1992), and Weinberg (1993).

of the Garden Path Model (Adams, Clifton, & Mitchell, ms; Clifton, 1994; Ferreira & Henderson, 1990). These studies attempted to demonstrate that the methodology used to study sentence processing can influence whether effects of sentence context are observed. Methodologies that cause reading to proceed more slowly than normal reading may lead to the observation of context effects, but methodologies that allow readers to process text in a normal fashion do not give rise to context effects.

The present experiments test predictions of the Garden Path Models (i.e. the original garden path model and the Lexical Filtering Proposal) and Constraint Satisfaction Approach, concerning the role of sentence context in resolving syntactic attachment ambiguities. In the experimental sentences, information about the subcategorizations of verbs in the sentence context either caused the attachment of the temporarily ambiguous prepositional phrase to be ambiguous or unambiguous. Two experiments tested sentences of the form presented in (2). Temporarily ambiguous prepositional phrases occurred after a relative clause. The temporarily ambiguous prepositional phrase could logically modify the first or second verb that the reader encounters. The nature of the first verb was manipulated. The first verb that the reader encountered was either a dative verb, a dative verb + pronoun, or a transitive verb.

(2) The kids threw the ball that Sara sent *to her mother.*

The dative verb could occur grammatically with or without the recipient prepositional phrase. The second verb that the reader encountered was consistently a verb that could occur with a recipient prepositional phrase, but that also could occur without such a phrase. A second manipulation involved the type of temporarily ambiguous prepositional phrase. It was either a recipient or locative phrase. Sentences were constructed such that the temporarily ambiguous prepositional phrase was preferred as a modifier of the second verb. The assumption that the temporarily ambiguous phrases were associated with the second verb was confirmed in an off-line questionnaire study using an additional group of subjects. Six conditions were tested. A sample stimulus is displayed in (3).

(3) a. The reverend sold the car that Tom donated *to the church*, but the car did not run well.

b. The reverend sold me the car that Tom donated *to the church*, but the car did not run well.

c. The reverend washed the car that Tom donated *to the church*, but the car did not run well.

d. The reverend sold the car that Tom donated *at the church*, but the car did not run well.

e. The reverend sold me the car that Tom donated *at the church*, but the car did not run well.

f. The reverend washed the car that Tom donated *at the church*, but the car did not run well.

If the reader uses information from the sentence context to determine the initial analysis of the ambiguous prepositional phrase as predicted by the Constraint Satisfaction Approach, then the type of verb that the reader first encounters in the sentence should influence the processing difficulty of the temporarily ambiguous recipient prepositional phrases. When the first verb is a dative verb and it is not followed by a pronoun, the temporarily ambiguous prepositional phrase can logically modify either the first or second verb in the sentence. This "lexical competition" should cause increased processing difficulty at the point of the prepositional phrase as compared with the dative verb + pronoun and transitive verb conditions in which contextual information can be use to determine that the prepositional phrase can modify only the second verb. The dative verb + pronoun and transitive conditions differ in that the contextual information is either information that a logically available argument role is filled or that there is not an argument role available at all. When the temporarily ambiguous prepositional phrase is a locative phrase, the type of verb that readers first encounter is not predicted to influence the processing difficulty of the ambiguous phrase. Most verbs can occur with locative phrases. Therefore, there should be "lexical competition" in each of the three conditions.

However, if the reader does not initially consider information from the sentence context in determining the analysis of the temporarily ambiguous prepositional phrase as predicted by the Garden Path Model and the Lexical Filtering Proposal, then the type of verb that the reader first encounters in a sentence should not influence the processing difficulty of either type of temporarily ambiguous prepositional phrase. The readers should follow the parsing principle Late Closure and associated the ambiguous phrase with the most recent part of the sentence. Because it is assumed that attaching complements such as recipient phrases generally involves the addition of fewer syntactic nodes than adjuncts such as locative phrases (i.e. following minimal attachment), a general complement preference is expected (See Radford, 1984 on the syntax of Complements and Adjuncts). Recipient prepositional phrases should be easier to process than locative prepositional phrases.

Two experiments were conducted. Experiment 1 employed self-paced phrase by phrase reading. Experiment 2 employed eye tracking during reading. Experiment 2 served not only as a replication of Experiment 1, but also provided additional information about the time course of processing. With self-paced reading, it was not possible to separate early processing on a phrase from later processing on a phrase. The reader was presented with a phrase, read it, pressed a key, and the phrase was removed from the computer screen. With eye tracking, it was possible to separate early processing on a word or phrase from later processing on a word or phrase, by analyzing reading time on the phrase before the eye moved forward in the text and analyzing any additional reading time on the phrase due to regressions that the eye made from later regions of the sentence. If information from the sentence context was used initially by the sentence processor, the context effect was expected to occur in the self-paced reading experiment and in the early analysis of the eye tracking experiment. If information from the sentence context was not used initially, but at some later point in processing, then context effect was expected to occur in self-paced reading, but only in the late analysis of the eye tracking experiment.

2 Experiment 1

2.1 Method

2.1.1 Subjects

Forty-two undergraduates at the University of Massachusetts participated in the experiment for course credit. All subjects were fluent in American English.

2.1.2 Materials

Eighteen experiment items were constructed having the form displayed in (2). The temporarily ambiguous prepositional phrase was always followed by a conjunction and the noun phrase that served as the direct object in the main sentence (e.g. 'and the noun phrase' or 'but the noun phrase'). The final prepositional phrase was either a recipient phrase (e.g. 'to the women') or a locative phrase (e.g. 'in the package'). In all conditions, the final prepositional phrase was intended to modify the most recent clause. In this way, sentences were constructed to have "Late Closure" interpretations. Twenty-four additional undergraduates at the University of Massachusetts were provided with a randomized list of the experimental items. Open ended questions were presented at the end of each item. Subjects were instructed to read each item and answer the question. Subjects' responses were consistent with Late Closure interpretations over 95 percent of the time.

2.1.3 Procedure

Sentences were presented to subjects on a computer screen. Subjects used response triggers, controlled with their left and right index fingers and the right thumb. A press of the thumb key began each sentence and advanced each phrase. The left and right index finger triggers were used to respond to true/false comprehension questions. Simple True/False Comprehension questions followed 50 percent of the sentences. The experiment was controlled by a microcomputer which presented the phrases in a non-cumulative moving window fashion. Before each sentence was presented, subjects were presented with a series of dashes on the computer screen. These dashes indicated to the subject where the sentence would appear on the computer screen. Each dash represented a single character. When the subjects pressed the thumb key, the first phrase was revealed in place of the corresponding dashes. When the subjects read the phrase and pressed the thumb key again, the second phrase appeared and the first phrase was replaced by dashes. When the subjects read the phrase and pressed the thumb key again, the third phrase appeared and the first phrase was replaced by dashes, and so the sentence was read until the last phrase was read. When a question occurred for a sentence, the word "Question" was presented for 500 ms and a simple TRUE/FALSE statement was presented on the computer screen. The word FALSE was presented below the question on the left side of the computer screen, and the word TRUE was presented on the right side of the computer screen. The time taken to read each sentence region, and the accuracy of the answers was recorded.

The total number of sentences in the experiment was 116: 18 experimental items and 98 additional items. Twenty-four of these additional items were items for a different experiment, involving noun compounds. The remaining items were filler items, having no recurring syntactic structure.

2.2 Results

Mean reading time in milliseconds per character was calculated for each presentation region. The example item in (4) displays the presentation regions. The '|' represents the end of a presentation region. Observations greater than 200 milliseconds per character, shorter than 10 milliseconds per character, or less than or greater than three standard deviations away from the subject's mean reading time were eliminated. These exclusions did not eliminate any data. Reading time on regions of the sentence that preceded the temporarily ambiguous phrase (regions 1 and 2) and the region that followed (region 4) did not differ significantly across the six experimental conditions, and therefore are not reported.

(4) The reverend sold the car | that Tom donated | *to the church,*| but the car | did not run well. |

Table 1 displays mean reading time in milliseconds per character on the prepositional phrase by type of prepositional phrase and by the type of verb in the sentence context. An analysis of Variance (ANOVA) was conducted using verb type and type of prepositional phrase as within-subjects factors. In these, and all subsequent analyses, ANOVAs using subjects (F_1) and items (F_2) as random effects were conducted.

Table 1

Reading Time in milliseconds per character on Prepositional Phrase from Experiment 1.

Verb Type	Recipient	Locative	Difference
Dative	58.3	68.4	-10.1
Dative + Pronoun	61.8	60.4	+1.4
Transitive	56.1	61.3	-5.2
Mean	58.7	63.4	-4.6

One effect of context was observed in the experiment, however, it was not the effect of context predicted by the Constraint Satisfaction Approach. Readers took longer to read the temporarily ambiguous recipient prepositional phrases when the prior sentence context contained a dative verb + pronoun than when the prior context contained either a dative verb alone or a transitive verb (61.8 vs. 58.3 and 56.1). This difference resulted in a marginally significant main effect of verb type, $F_1(1,41)= 6.28$, $p < .06$, $F_2(1,17)=3.36$, $p < .08$.

In the dative verb alone and transitive verb conditions, readers took longer to read temporarily ambiguous locative phrases than temporarily ambiguous recipient phrases. These differences resulted in a main effect of type of prepositional phrase, significant by subjects only, $F_1(1,41)=6.28$, $p < .02$, $F_2(1,17)=2.51$, $p < .09$ and a significant two-way interaction of context type x prepositional phrase type, $F_1(1,47)=4.05$, $p < .02$, $F_2(1,17)=3.34$, $p < .05$.

2.3 Discussion

The results of Experiment 1 support do not support the strong lexical "guidance" predictions of the Constraint Satisfaction Approach and other lexically driven models. The Constraint Satisfaction model predicted that readers would use information about the subcategorization possibilities of the verbs as well as information about any filled argument roles associated with the verbs in the sentence context in resolving the temporarily ambiguous. Resolving temporarily ambiguous recipient prepositional phrases was predicted to be more difficult when the verbs in the sentence context both subcategorized for a recipient prepositional phrase as compared to conditions in which the first verb was a dative verb + pronoun or a transitive verb. However, contrary to the prediction, readers actually took longer to read temporarily ambiguous recipient prepositional phrases when the prior sentence context contained a dative matrix verb + pronoun and readers also took longer to read temporarily ambiguous locative phrases when the prior sentence context contained a dative matrix verb.

The results appear to partially support the Garden Path Models of Sentence Processing. Both the original Garden Path Model and the Lexical Filtering Proposal predicted that the sentence context would not influence how readers initially analyzed the temporarily ambiguous prepositional phrases. The model predicted that generally temporarily ambiguous recipient phrases would be more difficult to process than temporarily ambiguous locative phrases. This stems from the assumption that complements of verbs (e.g. recipient phrases) are less syntactical complex than adjuncts of verbs (e.g. locative phrases). The results indicated that readers experienced more difficulty processing temporarily ambiguous locative prepositional phrases than temporarily ambiguous recipient phrases when the prior sentence context contained the dative matrix verb or a transitive matrix verb. However, when the prior sentence context contained a dative matrix verb + pronoun, temporarily ambiguous recipient prepositional phrases took slightly longer to read than temporarily ambiguous locative phrases. This results suggests that readers used information about a prior verb's filled argument roles, but did not use information about a prior verbs' unfilled argument possibilities.

The fact that readers took longer to read temporarily ambiguous recipient phrases than temporarily ambiguous locative phrases when the sentence context contained a dative verb + pronoun is inconsistent with the Garden Path Model, but consistent with the Lexical Filtering Proposal. The Garden Path Model predicted that the sentence processor would not use contextual information until there was structural evidence of a processing error. The sentences used a semantic cue to disambiguate the type of prepositional phrase, not a structural cue. However, the Lexical Filtering Proposal assumes that readers may use contextual information to evaluate an initial structure-based analysis. This process of evaluation may lead to the realization that the analysis is disfavored or that the relations specified by the analysis are implausible. If it can be established that contextual information in the dative + pronoun condition was used to evaluate the initial structure instead of guide the initial structure, the results would be completely consistent with the Lexical Filtering Proposal.

A second experiment was conducted to investigate this possibility. Because the eye tracking methodology can provide information about early and late processing during reading, it was used for Experiment 2. If the effect of context observed in Experiment 1 occurred due to an evaluation of an initial analysis, then

the effect should not be observed in the earliest stages of processing. It is expected to occur some time later.

3 Experiment 2

3.1 Method

3.1.1 Subjects

Twenty-four undergraduates at the University of Massachusetts participated in the experiment for course credit or $5.00 per hour. All subjects were fluent in American English and had normal or corrected vision.

3.1.2 Materials

The materials were the same as those used in Experiment 1.

3.1.3 Apparatus

Eye movements were recorded by a Stanford Research Institute Dual Purkinje Eye tracker, which has a resolution of less than 10 minutes of arc. Viewing was binocular with eye position recorded from the right eye. The eye tracker was interfaced with an Epson Equity III computer which control the presentation of the sentences. The output from the eye tracker was stored in the computer for later analysis. The sentences were presented on three lines of a Sony Trinitron 1302 monitor, with up to 72 character spaces per line. The letters were in lower-case, except where capital letters were called for (at the beginning of sentences and proper names). Subjects were seated 62 cm from the monitor and 4 letters equaled one degree of visual angle. The luminance from the monitor was adjusted to a comfortable brightness level for the subject and then held constant throughout the study. The room was dark except for an indirect light source.

3.1.4 Procedure

A bite bar was prepared for each subject and the functioning of the eye tracker was explained. Subjects were told they should read in a normal fashion, attempting to understand each sentence so that they could answer straightforward comprehension questions about it, and that they should press a button when they were finished reading the sentence. After an initial calibration period, ten practice sentences were presented in an individually-randomized order. Before each sentence, a brief calibration check was performed, and the eye tracker recalibrated if necessary. During each sentence an Epson Equity II microcomputer, interfaced with the Eyetracker, sampled the eye position each ms, determining when and where each fixation began and ended. One question was visually presented after each sentence had been read, and the subject responded by pressing one of two buttons for "true" and "false". After the practice, the eyetracker was recalibrated, and the 18 experimental sentences + 106 filler items were presented in an individually-randomized order, just as in the practice list. The entire session took approximately 45 minutes. Each subject was tested in one of four different counterbalancing conditions, to ensure that each experimental sentence was tested equally often in

each of the four forms, and that each subject received an equal number of sentences in each form.

3.2 Results

Fixations shorter than 80 ms in duration and only character away from the prior or next fixation were merged with that fixation. Fixations shorter than 40 ms and less than three characters away from the prior or next fixation were deleted. Any remaining fixations longer than 1000 ms or shorter than 50 ms were deleted. Rayner et al (1989) provides explanation for these exclusions.

Experimental items were assigned analysis regions. The analysis regions corresponded to the presentation boundaries used in Experiment 1. Readers are referred to the example in (4). Two measures of fixation time were calculated per region: gaze duration and total fixation time. Gaze duration measure includes all forward fixations that occur in the region before the eyes move beyond (i.e. to the right of) the region. If a regressive saccade occurs from a region to a prior region, the fixation time for the fixation following the regressive saccade is not included in the gaze duration measure. The total fixation time measure includes all fixations that occur in a region. These include all forward fixations as well as fixations resulting from a regressive saccade from a later region into the region of interest.

Table 2 displays mean gaze duration (and total reading time) in milliseconds per character on the prepositional phrase by type of prepositional phrase and by the type of verb in the sentence context. An ANOVA was conducted using verb type and type of prepositional phrase as within-subjects factors.

Table 2

Gaze Duration (and Total Reading Time) in milliseconds per character on the Prepositional Phrase from Experiment 2

Verb Type	Recipient	Locative	Difference
Dative	27 (32)	29 (38)	-2 (-6)
Dative + Pronoun	28 (37)	31 (36)	-3 (+1)
Transitive	29 (33)	31 (38)	-2 (-5)
Mean	28 (34)	30 (37)	-2 (-3)

The most notable result was that gaze duration and total time results revealed very different pattern. Gaze duration was generally longer on temporarily ambiguous locative prepositional phrases than temporarily ambiguous recipient phrases. This difference resulted in a significant main effect of prepositional phrase type, $F_1(1,47)=4.45$, $p < .05$, $F_2(1,17)=4.91$, $p < .04$. In contrast, total time results were very similar to the results observed in Experiment 1 using self-paced phrase by phrase reading. Total reading time was longer on temporarily ambiguous recipient prepositional phrases when the prior sentence context contained a dative verb + pronoun than when the prior context contained either a dative verb alone or a transitive verb (37 vs. 32 and 33). In the dative verb alone and transitive context conditions, readers took longer to read temporarily ambiguous locative phrases than temporarily ambiguous recipient phrases. The interaction of verb type and prepositional phrase type was no significant, $F_s < 1$.

Table 3 displays mean gaze duration (and total time) in milliseconds per character on the phrase following the prepositional phrase by type of prepositional phrase and by the type of verb in the sentence context. In all experimental items, the following phrase contained a conjunction (i.e. 'and' or 'but') followed by the determiner 'the' and the noun that served as the direct object of the sentence.

Table 3

First Pass Duration in milliseconds per character on the Next Phrase from Experiment 2

Verb Type	Recipient	Locative	Difference
Dative	27 (30)	29 (33)	-2 (-3)
Dative + Pronoun	29 (34)	27 (28)	+2 (+6)
Transitive	28 (30)	27 (30)	+1 (0)
Mean	28 (31)	28 (30)	0 (+1)

ANOVAs were conducted using verb type and type of prepositional phrase as within-subjects factors for both gaze duration and total time results. There were no significant results in gaze duration results. However, results total reading time were similar to the total time results on the ambiguous prepositional phrase itself. Total reading time was longer on temporarily ambiguous recipient prepositional phrases was longer when the prior sentence context contained a dative verb + pronoun than when the prior context contained either a dative verb alone or a transitive verb (34 vs. 30 and 30). This differences resulted in a significant two-way interaction of context type x prepositional phrase type, significant in the subject analysis only, $F_1(1,47)=3.96$, $p < .02$, $F_2(1,17)=2.85$, $p < .07$.

3.3 Discussion

Results from eye tracking reveal that the unexpected effect of context that was observed in Experiment 1 using self-paced reading occurred relatively late during processing. It was observed only in the total time measure. Not only was it not present in the gaze duration results, but in gaze duration, recipient prepositional phrases were easier to process than locative prepositional phrases.

A possible explanation for the unexpected effect of context that was observed is that difficulty arises when one must relate two recipients with a single noun phrase. In both the dative alone and the transitive conditions, there is only one recipient relationship that must be interpreted. In the dative + pronoun condition, the two acts of receiving must be related in time, i.e., one event might occur before the other. It is plausible to assume that this type of processing difficulty would occur late in processing, once all the word have been identified and the basic relationships among the words have been determined, because it would involve an evaluation of the relationships among words.

4 General Discussion

Two on-line reading experiments investigated whether prior context was used by readers to resolve temporarily ambiguous prepositional phrases. The first verb in the prior context contained either a dative verb, a dative verb + pronoun, or a transitive verb. Prepositional phrases were either recipients or locatives. Results from self-paced phrase by phrase reading indicated that readers took longer to read recipient prepositional phrases when the first verb in the sentence context was a dative verb followed by a pronoun as compared with conditions in which the sentence context contained either the dative verb alone or transitive verb. Readers also took longer to read locative phrases than recipient phrases when the sentence context contained either the dative verb alone or the transitive verb. These results suggest that readers did not use information about the unrealized subcategorization possibilities of the first verb in the sentence context, but that information about the filled subcategorization possibility was used. Results from eye tracking revealed that this effect of sentence context occurred late in processing, showing up in total fixation time on the prepositional phrase region, but not in first pass fixation time.

These results are most consistent with the Lexical Filtering Proposal of sentence processing which assumes that initial parsing decisions can be made without reference to nonsyntactic information. The model also assumes that nonsyntactic information may play an active role in evaluating the initial analysis, in signaling that the initial analysis is disfavored, and in guiding the sentence processor to adopt an alternative analysis.

These results are not compatible with the strongest version of a context guidance model which assumes that all potentially useful information will be used by the parsing in forming an initial analysis. If such a model were accurate, then temporarily ambiguous recipient prepositional phrases should have been harder to process when the sentence context contained a dative verb alone than a transitive verb. Furthermore, the effect of context that was observed did not appear to observe the initial processing of the prepositional phrase, but influenced only later processing. However, the results could be consistent with some version of a context guidance model that specifies how different sources of contextual influence get used differentially during syntactic ambiguity resolution.

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