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AUTHOR   Tanenhaus, Michael K.; Seidenberg, Mark S.
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ABSTRACT
        Research into the influence of a context sentence on
the processing of a subsequent sentence in spoken discourse examined
two issues: (1) whether context influences the immediate processing
and organization of a subsequent clause, and (2) whether listeners
make certain types of context-based inferences prior to the end of a
sentence. Three experiments were conducted involving a total of 98
college stuents. The first and second experiments demonstrated that
clauses with pronouns become better processing units in contexts that
provide a referential antecedent for the pronoun. The third
experiment demonstrated that listeners begin to make inferences
necessary to construct an antecedent for a definite noun phrase prior
to the end of a clause or sentence. The results suggest that there is
not an initial point in the comprehension process at which the
listener's representation of what has been heard is restricted to
information of the type provided by the context-independent
description posited by most grammars. The findings further suggest
that the initial processing and representation of a sentence in
discourse may differ from those of the same sentence in isolation.
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Technica Report No. 176

DISCOURSE CONTEXT AND SENTENCE PERCEPTION

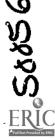Michael K. Tanenhaus
Wayne State University

Mark S. Seidenberg
University of Illinois at Urbana-Champaign
and
Bolt Beranek and Newman Inc.

July 1980

University of Illinois
at Urbana-Champaign
51 Gerty Drive
Champaign, Illinois 61820

Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

Abstract

Three experiments investigated the influence of a context sentence on the processing of a subsequent sentence. Experiments 1 and 2 demonstrated that clauses with pronoun subjects functioned as processing units only when preceded by a context sentence that established a referent for the pronoun. Experiment 3 suggested that listeners make inferences which link definite noun phrases to a preceding context as soon as the definite noun phrase is encountered. The results suggest that context can affect within-sentence processes in comprehension.

Discourse Context and Sentence Perception

Although many psycholinguists have recently turned their attention
to questions related to discourse, most research on language comprehension
has focused on the processes by which listeners understand single sentences
(see Levelt, 1978, for review). The reasons for this emphasis on the
sentence as the object of inquiry are probably largely historical, since
at the time this research was initiated, the dominant linguistic theory,
transformational generative grammar, provided a rich analysis of sentence
structure. A great deal of early psycholinguistic research attempted to
test the psychological reality of various aspects of transformational
grammar. While attempts to directly incorporate transformational grammars
into models of language comprehension were soon abandoned, much research
has continued to be guided by the assumption that at some point in the
comprehension process, the listener understands a sentence in terms of
a representation isomorphic with its linguistic deep structure (see
Fodor, Bever, & Garrett, 1974; Fodor, Fodor, & Garrett, 1975). For example,
Fodor, Fodor, and Garrett (1975) argue,

> it seems that any psychological model of such [communication]
> exchanges must recognize some formal object which captures the
> notion of the message standardly communicated by uttering a
> sentence. The view we are considering here--which, in fact,
> we endorse--requires that this object be among the structural
> descriptions that the grammar assigns to the sentence. (p. 516)

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This assumption is incorporated into the clausal model of sentence
perception proposed by Fodor, Bever, and Garrett (1974) which integrates much
of the sentence perception literature of the 1960's and early 1970's. The
clausal model proposes that syntactically well-formed clauses (which
correspond to deep structure sentences in standard theory) are the primary
processing units in sentence perception. As a clause is heard, the listener
uses perceptual mapping rules or strategies (Bever, 1970) to develop
potential representations of the clause by mapping each word onto its
deep structure role. Once the clause ends, it is recoded into a more
abstract form which frees limited capacity resources to process subsequent
input (Bever, Garrett, & Hurtig, 1973; Fodor, Bever, & Garrett, 1974).

In the clausal model, both the perceptual operations in language
comprehension and the representation that the listener assigns a sentence
are closely tied to the grammatical structure of the sentence. Since
grammatical structure is invariant across discourse contexts, it is not
surprising that research in this tradition has tended to ignore discourse
variables.

The clausal model followed from research that examined the processing
of individual sentences extracted from their natural discourse contexts.
Research on discourse processing has instead emphasized the constructive
nature of the comprehension process (Bransford, Barclay, & Franks, 1972).
The representation that the listener assigns to a sentence in a discourse
is assumed to derive not merely from information that is explicitly stated

within the sentence, but also from information provided in the linguistic
and extralinguistic contexts, and from listener-generated information
derived from knowledge of the world. The representation that is the output
of the comprehension process is thought to depend heavily upon inferences
which are drawn in order to link propositions in the discourse and fill in
missing information. While it is difficult to cast a net around all existing
theories of discourse processing, there is general agreement with the
following observation by Barclay (1973):

> . . . comprehension is a constructive process in which semantic
> representations derive from the interplay of sentential infor-
> mation, the context of knowledge to which the information is
> assimilated, task demands, and the assimilation processes them-
> selves, including interpretive and logical operations. These
> semantic representations in turn serve as memory representations.
> (pp. 231-232)

Thus, two different views of the comprehension process emerge.
Researchers in the sentence perception tradition have tended to view the
initial stages of the comprehension process as closely tied to the gram-
matical structure of the clause or sentence, and as relatively invariant
across contexts. Researchers interested in discourse have assumed that
the initial stages in comprehension are heavily influenced by the extended
context. Unfortunately, these different points of view are correlated with
differences in method; most research on the early stages in processing has
examined isolated sentences, ignoring discourse variables, while research
on discourse has tended to use memory paradigms that may not reflect the

representations that are initially derived. As a result, we do not have a clear answer to the question: Do discourse variables influence processes involved in the immediate analysis of a clause or sentence?

The few studies which have addressed this question have provided equivocal or contradictory results. Many of these studies involve the processing of ambiguous utterances. Bever, Garrett, and Hurtig (1973) presented subjects with complete and incomplete clauses that were structurally ambiguous (e.g., Although the solution was clear . . .). The subjects' task was to produce a continuation which formed a complete sentence. Sentence completion times were longer for ambiguous fragments compared with unambiguous fragments only when they were incomplete clauses. Bever et al. argued that these results were obtained because listeners compute multiple readings of ambiguous fragments and select one at the clause boundary. Following incomplete ambiguous clauses, subjects had to choose between two alternate readings before completing the sentence. Following complete clauses, only one reading was available, and no choice was required. Hurtig (1978) found that this difference between clause types also obtained when the ambiguous stimuli were placed in discourse contexts which were biased toward one reading. He concluded that clausal processing strategies are not influenced by discourse context. Tyler and Marslen-Wilson (1977) presented listeners with structurally ambiguous fragments such as flying planes preceded by a clause that biased one reading (e.g., If you walk too near a runway or Even if you are a trained pilot). Each fragment was

followed by a target word, either is or are, which was presented visually.
The context clause determined whether is or are was the grammatical
continuation of the phrase flying planes. Reaction times to read the
target word were faster when the word was a contextually appropriate
continuation, suggesting that listeners were making use of the context
prior to the clause boundary. Thus the Hurtig (1978) and Tyler and
Marslen-Wilson (1977) studies lead to opposite conclusions about the
role of context on within-clause processing.[1]

A closely related issue concerns when in the comprehension process
listeners and readers draw inferences that link explicitly stated
information. In a sequence such as (1), the listener or reader must infer
that the beer refers to the picnic supplies mentioned earlier.

(1) Horace got some picnic supplies out of the car. The beer
     was warm.

(2) Horace got some beer out of the car. The beer was warm.

In (2), however, no inference is required, since the antecedent is explicitly
stated. According to a model in which within-sentence processing proceeds
without regard to discourse context, the listener would assign an initial
representation to the sentence The beer was warm in (1), and then seek a
referent for the definite noun phrase. The same initial representation would
also be assigned in (2), where no subsequent search is required. In contrast,
a model in which context can affect within-sentence processing might
predict that listeners attempt to establish a referent for the definite

noun phrase immediately after it is encountered, rather than waiting for the end of a major grammatical unit. On this view, The beer was warm is assigned different initial representations in (1) and (2).

Haviland and Clark (1974) examined comprehension times for target sentences beginning with definite noun phrases (such as The beer was warm) when preceded by a context sentence which either provided a direct antecedent, as in (2), or required an inference, as in (1). Comprehension times were longer when the inference was required. Haviland and Clark proposed that on encountering a definite noun phrase, the listener immediately searches memory for an antecedent. If none is found, an inference is drawn in order to establish one.

Haviland and Clark's results established that listeners generate linking inferences and that this process can take time. However, these results do not reveal when in the sequence of processing events such inferences are generated. In particular, Haviland and Clark's results are also consistent with models such as Hurtig (1978) and Fodor, Fodor, and Garrett (1975), in which linking inferences are not made until the end of a clause or sentence. Similar arguments hold for other studies (e.g., Carpenter & Just, 1977; Kintsch & Keenan, 1973) which demonstrate that inferences are made in the comprehension of text or discourse.

The present article addresses two questions concerning the influence of discourse context on sentence processing: (a) Does context influence clausal processing strategies? And (b) do listeners make certain types of context-based inferences prior to the end of a sentence? These two

questions provide a natural starting point for an investigation of the
influence of discourse context on sentence perception, given the
importance of clausal processing and inferencing in current comprehension
models.

Experiment 1

A great deal of research has concentrated on identifying the major
processing unit in sentence perception. A guiding assumption has been
that this unit must correspond to a theoretically defined linguistic
structure. Various candidates have included phrases, surface structure
clauses, and clauses corresponding to deep structure sentences (for
review, see Carroll, Tanenhaus, & Bever, 1978). However, Tanenhaus and
Carroll (1975) suggested that whether or not a syntactically well-defined
clause functions as a processing unit depends on a set of additional
factors. Under their "functional clause" hypothesis, clauses which
contain a complete and fully specified set of grammatical relations,
such as (3), function as better processing units than clauses with
deleted or unspecified grammatical relations, such as (4-5).

(3)   After the tall boy returned home, ...

(4)   After he returned home, ...

(5)   After returning home, ...

Carroll et al. (1978) reviewed a number of recent studies that support their
hypothesis. For example, Marslen-Wilson, Tyler, and Seidenberg (1978)
showed that clauses with specified noun phrase subjects are better

processing units than clauses with pronoun subjects. They presented
subjects with a cue word followed by a biclausal sentence which began
with a clause containing either a pronoun or a specific noun. The
subjects' task was to monitor the sentence for a word which either rhymed
with or was a category exemplar of the cue word (rhyme and category
monitoring). For example, if the target word was CAT, the cue was either
BAT or ANIMAL. Targets were either the final word in the first clause
or the initial word in the second clause. Performance on the two tasks
was similar. For clause-final targets, monitor latencies showed no
difference for the two types of clauses. For targets in the second
clause, monitor latencies were faster following clauses with pronouns,
suggesting that the clauses had not functioned as processing units.
Similar results were reported by Carroll and Tanenhaus (1978).

These experiments suggest that clauses with unspecified information
are poorer processing units than clauses in which all information is
fully specified. Note, however, that in normal discourse, clauses with
unspecified information are often preceded by contexts that provide the
missing information. Experiment 1 used the rhyme monitor task to
investigate whether clauses containing pronouns become better processing
units in contexts that provide antecedents. Subjects heard two-clause
sentences in which the subject of the first clause was either specified
(6a) or pronominal (6b). Following Marslen-Wilson et al. (1978), these
will be termed determinate and indeterminate, respectively. Each target

sentence appeared with two context sentences, which either provided an antecedent for the pronoun (informative contexts such as 7a) or did not (neutral contexts such as 7b).

Targets:

(6a) When parents are cruel, kids often become delinquent.

(6b) When they are cruel, kids often become delinquent.

Contexts:

(7a) Some parents can be extremely insensitive.

(7b) There is one thing I learned in my sociology class.

The rhyme word was always the first word of the second clause in the second sentence (e.g., KIDS). In neutral contexts, monitor times should be faster following indeterminate clauses compared to determinate clauses, as in the Marslen-Wilson et al. (1978) study, for two reasons. First, the indeterminate clauses create the expectation that certain information will be forthcoming, in particular, information that will fill the slot created for the referent of the subject pronoun (Sidner, 1979). Thus, the listener is actively seeking missing information, and the context can be used in a predictive or top-down manner, facilitating subsequent decoding (Fischler & Bloom, 1979). This will not occur in the determinate clauses, where there are no empty slots and little information is provided concerning the initial noun phrase of the second clause. Second, information in the indeterminate clauses will be more accessible to the listener, a fact which may also facilitate continued processing of the input. Because they contain an explicit subject, verb,

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and object, determinate clauses will be recoded, which, in the clausal
processing model, results in removal from working memory and loss of
surface-level information (Fodor, Bever, & Garrett, 1974). Indeterminate
clauses cannot be recoded because the subject is missing; hence, their
literal form remains directly accessible in working memory.

With informative contexts, the facilitation in rhyme detection
following indeterminate clauses should be eliminated if listeners are
able to use the information in the context sentence to assign the pronoun
a referent prior to completion of the clause. That is, both determinate
and indeterminate clauses should function alike in informative contexts.

Method

Subjects. Thirty-two members of the Columbia University community
served as subjects and were paid $3.50.

Materials. Twenty sets of two-sentence discourses were derived from
sentences such as (6-7). Each set contained four discourses: (a) a
neutral context sentence followed by a sentence beginning with a deter-
minate clause; (b) a neutral context sentence followed by a sentence
beginning with an indeterminate clause; (c) an informative context sent-
ence followed by a sentence beginning with a determinate clause; and
(d) an informative context sentence followed by a sentence beginning with
an indeterminate clause. This yielded 80 test stimuli.

Four presentation versions were generated from these discourses
and arranged into a modified Latin Square. Each presentation version

contained one discourse from each set. There were five examples of each type of discourse per presentation version. Discourses taken from a particular set maintained the same serial position across presentation versions. Each subject heard 20 test items and 30 filler discourses added to vary the structure of the stimuli.

Each set was assigned a one-syllable cue word that rhymed with the first word of the second clause in the target sentence (hereafter, the target word). For the filler discourses, the position of the target word was varied within the first and second sentences.

The presentation versions were recorded with normal intonation on one track of a stereo tape. The sequence of events on a trial was as follows: cue word, 5-sec pause, context sentence, 2-sec pause, sentence containing target. A timing tone was placed on the other channel of the tape at the beginning of the target word.

Procedure. Each subject was randomly assigned to one presentation version. Subjects heard the stimuli binaurally through stereo headphones. Their task was to monitor each sentence pair for a word which rhymed with the cue word. In order to make sure that subjects attended to the meaning of the sentences, they were required to paraphrase each sentence pair after it was heard. The timing tone, which was inaudible to the subject, started a millisecord timer which stopped when the subject pressed a telegraph key indicating detection of the rhyme.

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Results and Discussion

The 32 subjects and 20 experimental trials generated a total of 640 possible rhyme monitor times. Ten times were eliminated from the analysis either because the subject fa..ed to detect the word or because the monitor times exceeded 1.5 sec. Mean monitor latencies for each condition are presented in Table 1. The results were analyzed using an ANOVA with

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Insert Table 1 about here.

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clause type and context type as factors. Separate ANOVAs were performed using subjects and discourse sets as random factors. Both analyses revealed a clause type by context type interaction, $F(1,28) = 4.84$, $p < .05$, in the subject analysis, and $F(1,18) = 4.26$, $p < .06$, in the item analysis. The interactions obtained because monitor times were 39 msec faster following clauses with pronouns than clauses with referential nouns in the neutral contexts. This difference was significant in the subject analysis, $F(1,31) = 6.44$, $p < .025$, and in the item analysis, $F(1,19) = 4.97$, $p < .05$. With informative contexts, latencies following determinate and indeterminate clauses did not differ significantly. These results suggest that clauses with pronouns are poorer processing units than clauses with referential nouns only in contexts which do not supply a referent for the pronoun.

If indeterminate clauses become better processing units when the referent of the pronoun is specified in the preceding context, rhyming latencies for indeterminate clauses in informative contexts should be

longer than in neutral contexts. This pattern of results obtained;
however, the 19-msec difference did not approach significance. An
examination of the stimulus materials suggested a possible explanation.
For several of the sets, the target word seems to be more predictable
in the informative context than in the neutral context. Examples are
given in (8) and (9). The first sentence in each pair is the informative
context, and the target word is presented in parentheses.

(8a) Now and then, everyone likes a few drinks.

(8b) Some things are guaranteed to draw a crowd.
(bars)

(9a) The tracks on the Penn Central are in terrible shape.

(9b) Commuters are frequently delayed.
(trains)

If subjects were able to predict the target word given the informative
context, monitor times would be faster in general following informative
contexts than neutral contexts. This would explain the absence of a
significant increase in monitor times in clauses with pronouns in informa-
tive compared to neutral contexts.[2] It would also explain why monitor
times following clauses with referential nouns were faster in informative
contexts than in neutral contexts. This 31-msec difference approached
significance in the subject analysis, $F(1,31) = 3.99$, and in the item
analysis, $F(1,19) = 3.30$.

In order to determine whether the target words were more predictable
in informative than neutral contexts, 30 subjects were given each cue word

followed by either the informative or neutral context sentence. Their

task was to try to use the context sentence to generate a word that

rhymed with the cue word. The type of context given for each of the

20 sentence sets was counterbalanced across two groups of subjects

(15 in each group). For the informative contexts, 44% of the rhymes

generated by the subject were the same as the target word used in

Experiment 1, as compared to 39% for the neutral contexts. On the basis

of these estimates of predictability, the 20 sentence sets were

divided into three groups: (a) seven sets in which the target word was

at least 15% more predictable, in the informative context than in the

neutral context; (b) five sets in which the target word was 15% more

predictable, in the informative context than in the neutral context;

(b) five sets in which the target word was 15% more predictable in the

neutral context; and (c) eight sets in which the target word was equally

predictable in both contexts. Mean monitor latencies for each of these

three groups are presented in Table 2.

Insert Table 2 about here.

When the target word was equally predictable, monitor latencies

in neutral contexts were faster following indeterminate clauses than

determinate ones. In the informative contexts, however, monitor times

were longer following indeterminate clauses. Furthermore, monitor times

following indeterminate clauses were 65 msec longer in informative contexts

than in neutral contexts. Thus when the informative and neutral contexts
were equated for predictability, monitor times following clauses with
pronouns were longer in informative than in neutral contexts, as predicted.
Experiment 2 attempted to replicate this result with a larger sample of
items in which the target word was equated for predictability in the
neutral and informative contexts.

Experiment 2

Method

Subjects. The subjects were 34 members of the Columbia University
community who were paid $3.50 for participating.

Materials. The experimental materials consisted of two presentation
versions, each containing 40 two-sentence discourses. Twenty-six of these
were filler discourses. The experimental discourses were modified from
the materials used in Experiment 1.

Each target sentence was paired with both neutral and informative
contexts (e.g., sentence [6b] was paired with [7a] and [7b]); subjects
heard one of the two resulting discourses. The matched discourses were
assigned to the same serial position in the two presentation versions.
All stimuli were recorded with normal intonation. Each discourse began
with a cue word followed by a 5-sec pause and then the two sentences
separated by a 2-sec pause. Other aspects of the procedure were identical
to those followed in Experiment 1.

Results and Discussion

With 34 subjects and 14 targets, there were a total of 476 possible
monitor times. Seventeen scores were eliminated either because the
subject failed to detect the target word or because the monitor times
exceeded 1.5 sec. The mean monitor latency was 450 msec in the neutral
contexts as compared to 498 msec in the informative contexts. This
difference was significant in ANOVAs conducted with subjects and items
as random factors, $F(1,32) = 11.28$, $p < .01$, and $F(1,23) = 5.40$, $p < .05$,
respectively.

The combined results of Experiments 1 and 2 suggest that the infor-
mation within a clause plays a role in determining the extent to which
the clause will be treated as a perceptual unit. Clauses containing
referential nouns (determinate clauses) functioned as better processing
units than clauses with pronouns (indeterminate clauses). The results
indicate that listeners use contextual information while processing a
subsequent clause, since indeterminate clauses were processed in the
manner of determinate clauses when preceded by contexts which provided
a referent.

Haviland and Clark's (1974) given-new strategy provides one possible
characterization of these results. After encountering a pronoun,
listeners search working memory for possible antecedents. If they find
an antecedent, the clause can be fully processed. If no antecedent is
found, however, the listener may maintain the clause in working memory
until an antecedent is found later in the sentence or discourse.

Pronouns are not the only structural devices in language which may
lead the comprehender to search memory for antecedents. In English,
definite articles are generally used when the following noun has been
previously introduced in the discourse (e.g., "Harry liked the cat.").
The referent of the noun phrase may be explicitly stated in the preceding
context; often, however, the listener must infer the antecedent on the
basis of extra-linguistic contextual information and previous knowledge.
The latter cases require what Clark (1975) has labeled bridging inferences.
Experiment 3 investigated when in the comprehension process these infer-
ences are generated.

Experiment 3

We sought to determine if listeners would make bridging inferences
immediately following a definite noun phrase or if bridging would be
postponed until the end of the sentence containing the definite noun
phrase. The materials were modified from those used by Haviland and
Clark (1974). Two types of target sentences were used: target sentences
beginning with a definite noun phrase (such as those used by Haviland and
Clark) and target sentences ending with a definite noun phrase. A
sample pair of target sentences is given in (10). The definite noun
phrase is underlined.

(10a) The murderer was one of John's friends.

(10b) One of John's friends was the murderer.

(11a) John was murdered yesterday.

(11b) John died yesterday.

Based on Haviland and Clark's work, comprehension times to target
sentences should be faster when the sentences are preceded by direct
antecedent contexts such as (11a) than when they are preceded by indirect
antecedent contexts such as (11b). The question of primary interest
here is the relative magnitude of this context effect for the noun-phrase-
initial and noun-phrase-final target sentences. If listeners do not begin
making the linking inference until they have finished constructing a
linguistic representation for the entire target sentence, there should
be no difference in the magnitude of the context effect for the two types
of target sentences. If, however, listeners begin to make the linking
inference as soon as they have encoded the definite noun phrase, the
context effect should be smaller when the definite noun phrase comes at
the beginning of the sentence than when it comes at the end of the sentence.

Method

Subjects. The subjects were 32 students from the Columbia University
community who were paid $3.50 for participating.

Materials. Thirty-two pairs of target sentences containing a
definite noun phra   were constructed. In one member of each pair, the
sentence began with a definite noun phrase (e.g., 10a) and in the other
member, the sentence ended with a definite noun phrase (10b). Sentences
in each pair were semantically similar. Two contexts were constructed
for each of the sentence pairs. The direct antecedent context provided
an antecedent for the definite noun phrase in the target sentence (11a),

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while the indirect antecedent context required the subject to make an inference in order to integrate the context and target sentence (11b).

Each set of two context sentences and two target sentences yielded four possible two sentence pairs: (a) a direct antecedent context followed by a sentence beginning with a definite noun phrase; (b) a direct antecedent context followed by a sentence ending with a definite noun phrase; (c) an indirect antecedent context followed by a sentence beginning with a definite noun phrase; and (d) an indirect antecedent context followed by a sentence ending with a definite noun phrase. Four presentation versions, each containing 32 two-sentence discourses, were constructed by assigning the four sentence pairs from the same set to different presentation versions. This resulted in eight exemplars of each condition in each presentation version.

Procedure. Each subject was assigned to one presentation version. Subjects heard the sentences binaurally over stereo headphones and were instructed to press a key following the end of each sentence pair when they understood the two sentences. A timing tone at the end of the second sentence started a millisecond timer which stopped when the subject pressed a telegraph key.

Results and Discussion

The 28 subjects generated a total of 896 reaction times. Due to a mistake in recording, one item was eliminated, leaving 868 comprehension

times. Seven of these times were lost either due to mechanical failure
or experimenter error. The results are presented in Table 3. In direct

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Insert Table 3 about here.
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antecedent contexts, comprehension times were similar for target sentences
in which the noun phrase came early and sentences in which the noun phrase
came late. Comprehension times were longer for both types of target
sentences when the context did not provide a direct antecedent and thus
required an inference. This inference effect was larger when the definite
noun phrase came at the end of the target sentence.

This pattern of results was reflected in a main effect of context
in an ANOVA treating subjects as a random factor, $F(1,30) = 23.22$, $p < .01$,
and in an ANOVA treating items as a random factor, $F(1,30) = 7.10$, $p < .025$.
The effect of target sentence type was significant in the subject analysis,
$F(1,24) = 5.97$, $p < .025$, but not in the item analysis, $F(1,30) = 1.05$.
Finally, the context by target sentence interaction was significant in
the subject analysis, $F(1,24) = 12.47$, $p < .001$; however, it was only a
trend in the item analysis, $F(1,30) = 3.16$.

Planned comparisons indicated that the effect of sentence type was
due to the 65-msec difference between the noun-phrase-initial and noun-
phrase-final sentences in the indirect antecedent contexts. This differ-
ence was significant in the subject analysis, $F(1,27) = 24.44$, $p < .001$,
and in the item analysis, $F(1,30) = 5.55$, $p < .05$. The context effect

was primarily due to the difference between the noun-phrase-final

sentences in the direct and indirect antecedent contexts. This difference

was significant in the subject analysis, $F(1,27) = 54.36$, $p < .001$, and

in the item analysis, $F(1,30) = 13.16$, $p < .005$. The 32-msec difference

between the noun-phrase-initial sentences in the direct and the indirect

antecedent contexts was significant in the subject analysis, $F(1,27) = 5.9$,

$p < .05$, but not in the item analysis, $F(1,30) = 1.36$.

The results are in good overall agreement with Haviland and Clark's

account of how listeners retrieve or construct antecedents for definite

noun phrases. The overall effect of context indicated that listeners are

making a linking inference when the context did not provide a direct

antecedent for the definite noun phrase in the target sentence. The

context by sentence type interaction was due to the inference effect being

smaller when the noun phrase came early in the target sentence. This

suggests that listeners began to make linking inferences as soon as they

encountered the definite noun phrases.

There were, however, several aspects of the data which deserve com-

ment. First, the context by target sentence interaction was only a trend

in the item analysis, while the difference between comprehension times

to noun-phrase-initial sentences in direct and indirect antecedent con-

texts was significant only in the subject analysis. Thus, the results

can only tentatively be generalized to a new population of materials.

The weakness of the item analyses compared to the subject analysis

probably reflects the fact that the type and difficulty of the inferences

required in the sentence sets varied. There are no process-oriented

taxonomies of different classes of inferences presently available,

although work by Clark (1975) and Hildyard and Olson (1978) is a step

in this direction. In addition, there has been relatively little research

on the difficulty of various inferences types. Given this situation, it

is likely that our materials did not form a completely homogeneous set.

Finally, the magnitude of the difference between comprehension times

of noun-phrase-initial sentences in direct and indirect antecedent contexts

was relatively small compared to the difference observed by Haviland

and Clark. There are two possible explanations. Some of the difference

is probably due to the fact that we measured comprehension times from the

end of the target sentence, while Haviland and Clark measured comprehension

time to read and understand the entire target sentence. As a result,

our comprehension times were nearly a full second faster than Haviland

and Clark's. A more interesting possibility relates to the fact that

we used auditory presentation while Haviland and Clark used visual presenta-

tion. With visual presentation, the reader controls the rate at which

information is taken in. With auditory presentation, however, the listener

does not. Haviland and Clark's subjects may have waited until completing

the inference before reading the remainder of the sentence. With fairly

simple inferences such as those required to understand the discourses

in this experiment, subjects may have been able to make the inference

without interfering with their processing of the remainder of the sentence,

particularly when the definite noun phrase came at the beginning of the

target sentence.

General Discussion

The present research was conducted to answer two questions about the influence of discourse context on the processing of a subsequent sentence: (a) Can context influence the immediate processing and organization of a subsequent clause? And (b) do listeners make certain types of context-based inferences prior to the end of a sentence? The answer to both questions is clearly affirmative. Experiments 1 and 2 demonstrated that clauses with pronouns become better processing units in contexts that provide a referential antecedent for the pronoun. Experiment 3 demonstrated that listeners begin to make inferences necessary to construct an antecedent for a definite noun phrase prior to the end of a clause or sentence.

These results suggest that there is not an initial point in the comprehension process at which the listener's representation of what has been heard is restricted to information of the type provided by the context-independent description posited by most grammars. Instead, it appears that the initial processing and representation of a sentence in discourse may differ from those of the same sentence presented in isolation. This conclusion is clearly inconsistent with models of comprehension, such as Fodor, Fodor, and Garrett (1975), which propose that there is a temporally distinct stage in initial comprehension in which the listener understands a sentence in terms of the representation assigned to it by a sentence grammar. This represents a further weakening of the relationship between

grammatical theories and models of the comprehension process. The proponents
of the derivational theory of complexity (e.g., Miller & McKean, 1964)
assumed that linguistic grammars provided an account of both the perceptual
processes and memory representations that are the output of the sentence
comprehension process. Since then, there has been a consistent weakening
of claims about how closely grammars described aspects of the comprehension
process (for further discussion, see Fodor, Bever, & Garrett, 1974). The
linguistic representation of a sentence may be among the products of compre-
hension. However, attempts to define a stage in processing or representation
which is isomorphic with such linguistic structures have been unsuccessful
(Carroll et al., 1978; Seidenberg & Tanenhaus, 1977). The present results
suggest that the proposal by Fodor, Fodor, and Garrett (1975) is also likely
to be incorrect.

These results have other implications for models of language compre-
hension. A great deal of research in sentence processing has demonstrated
that clauses are important units (Bever, Garrett, & Hurtig, 1973; Hurtig,
1978; Townsend & Bever, 1979). The results of Experiments 1 and 2 suggest
that clausal processing strategies can be affected by discourse context.
This is not to say, however, that the types of perceptual processes
postulated by the clausal model are invalid at the discourse level. In
fact, Experiments 1 and 2 demonstrate that the type of "segmentation"
postulated by Bever and his colleagues occurs in discourse processing.
However, a complete understanding of sentence processing must take into
account discourse context.

Investigations of within-sentence processing in discourse may con-
tribute to our understanding of discourse comprehension. An important
part of discourse comprehension involves integrating propositions across
sentences (Kintsch & van Dijk, 1978). Much of this integration may take
place on-line as a sentence is processed. Retrieving antecedents and
making linking inferences during the processing of a sentence probably
result in related information being integrated and stored together in
memory. In support of this conjecture, it is interesting to note that
many of the stylistic devices that complicate sentence processing, such
as pronominalization, ellipsis, and subordination, seem to facilitate
discourse processing and memory.

References

Barclay, J. R. The role of comprehension in remembering sentences.
Cognitive Psychology, 1973, 4, 229-254.

Bever, T. G. The cognitive basis for linguistic structures. In J. R.
Hayes (Ed.), Cognition and the development of language. London:
Wiley, 1970.

Bever, T. G., Garrett, M. F., & Hurtig, R. The interaction of perceptual
processes and ambiguous sentences. Memory and Cognition, 1973, 1,
277-286.

Bransford, J. 0., Barclay, J. F., & Franks, J. J. Sentence memory: A
constructive versus interpretive approach. Cognitive Psychology,
1972, 3, 193-209.

Carpenter, P., & Just, M. A. Reading comprehension as eyes see it. In
M. A. Just & P. Carpenter (Eds.), Cognitive processes in comprehension.
Hillsdale, N.J.: Erlbaum, 1977.

Carroll, J. M., & Tanenhaus, M. K. Functional clauses and sentence seg-
mentation. Journal of Speech and Hearing Research, 1978, 21, 693-708.

Carroll, J. M., Tanenhaus, M. K., & Bever, T. G. The perception of
relations: A case study in psycholinguistic research. In W. J. M.
Levelt & G. B. Flores D'arcais (Eds.), Studies in the perception of
language. London: Wiley, 1978.

Clark, H. H. Bridging. In R. Schank & B. Nash-Webber (Eds.), Theoretical
issues in natural language processing. Arlington, Va.: Center for
Applied Linguistics, 1975.

Fischler, I., & Bloom, P. A. Automatic and attentional processes in the effects of sentence contexts on word recognition. _Journal of Verbal Learning and Verbal Behavior_, 1979, _18_, 1-20.

Fodor, J. A., Bever, T. G., & Garrett, M. F. _The psychology of language._ New York: McGraw-Hill, 1974.

Fodor, J. D., Fodor, J. A., & Garrett, M. F. The psychological unreality of semantic representations. _Linguistic Inquiry_, 1975, _6_, 515-531.

Haviland, S. E., & Clark, H. H. What's new? Acquiring new information as a process in comprehension. _Journal of Verbal Learning and Verbal Behavior_, 1974, _13_, 512-521.

Hildyard, A., & Olson, D. R. Memory and inference in the comprehension of oral and written discourse. _Discourse Processes_, 1978, _1_, 91-117.

Hurtig, R. The validity of clausal processing strategies at the discourse level. _Discourse Processes_, 1978, _1_, 195-202.

Kintsch, W., & Keenan, J. Reading rate and retention as a function of the number of propositions in the base structure of sentences. _Cognitive Psychology_, 1973, _5_, 57-64.

Kintsch, W., & van Dijk, T. A. Toward a process model of text comprehension and production. _Psychological Review_, 1978, _85_, 363-394.

Levelt, W. J. M. A survey of studies in sentence perception. In W. J. M. Levelt & G. B. Flores D'arcais (Eds.), _Studies in the perception of language._ London: Wiley, 1978.

Marslen-Wilson, W. D., Tyler, L. K., & Seidenberg, M. S. The semantic control of sentence segmentation. In W. J. M. Levelt & G. B. Flores D'arcais (Eds.), _Studies in the perception of language._ London: Wiley, 1978.

Miller, G. A., & McKean, K.   A chronometric study of some relations be-

tween sentences.   Quarterly Journal of Experimental Psychology, 1964,

16, 297-308.

Neely, J. H.   Semantic priming and retrieval from lexical memory: Roles

of inhibitionless spreading activation and limited-capacity attention.

Journal of Experimental Psychology: General, 1977, 106, 226-254.

Seidenberg, M. S., & Tanenhaus, M. K.   Psychological constraints on grammars:

On trying to put the real back in "Psychological Reality."   In W. A.

Beach, S. E. Fox, & S. Philosoph (Eds.), Papers from the thirteenth

regional meeting.   Chicago: Chicago Linguistic Society, 1977.

Sidner, C. L.   Towards a computational theory of definite anaphora compre-

hension in English discourse (Tech. Rep. No. 537).   Cambridge, Mass.:

MIT Artificial Intelligence Laboratory, June 1979.

Tanenhaus, M. K., & Carroll, J. M.   The clausal processing hierarchy . . .

and nouniness.   In R. E. Grossman, L. J. San, & T. J. Vance (Eds.),

Papers from the parasession on functionalism.   Chicago: Chicago

Linguistic Society, 1975.

Townsend, D. J., & Bever, T. G.   Interclause relations and clausal processing.

Journal of Verbal Learning and Verbal Behavior, 1978, 17, 509-521.

Tyler, L. K., & Marslen-Wilson, W. D.   The on-line effect of semantic

content on syntactic processing.   Journal of Verbal Learning and Verbal

Behavior, 1977, 16, 683-692.

Footnotes

[1] In Hurtig's (1978) study, the biasing information was presented in
a context sentence which preceded the fragment, while in Tyler and Marslen-
Wilson's (1977) study, the biasing information was in a subordinate clause
which was part of the same sentence as the ambiguous fragment. Tanenhaus
and Carroll (1975) have proposed that the information in subordinate
clauses is maintained in immediate memory to aid integration with the
main clause. Supporting evidence comes from Townsend and Bever (1978).
This suggests that the disambiguating information would have been more
accessible to guide further processing in the Tyler and Marslen-Wilson
study than in the Hurtig study.

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[2]For most of the sentence sets, the referential noun was closely
related to the target word. Thus at first glance, the predictability
explanation seems inconsistent with the fact that monitor times were
faster following clauses with pronouns than clauses with referential nouns.
One possible explanation is that subjects did not have time to use the
information in the first clause to predict the target word. Generating
predictions takes both time and processing resources (Neely, 1977), and
listeners may not have had enough of either available at the time that
they encountered the referential noun. The 2-sec pause between the
context sentence and the target sentence may have provided subjects with
the time to generate a prediction.

Table 1

Results for Experiment 1

Context	Clause Type	Monitoring Latencies in msec
Neutral	Determinate	524
Neutral	Indeterminate	485
Informative	Determinate	493
Informative	Indeterminate	504

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Table 2

Predictability Analysis for Experiment 1

Predictability of Target Words in Neutral and Informative Contexts	Context Type	Clause Type	Monitor Latencies in msec
Target word more predictable in informative contexts than neutral contexts (68% compared to 30%)	Neutral	Determinate	522
	Neutral	Indeterminate	498
	Informative	Determinate	448
	Informative	Indeterminate	453
Target word more predictable in neutral than informative contexts (72% compared to 43%)	Neutral	Determinate	487
	Neutral	Indeterminate	483
	Informative	Determinate	521
	Informative	Indeterminate	523
Target word equally predictable in neutral and informative contexts (26% compared to 28%)	Neutral	Determinate	549
	Neutral	Indeterminate	484
	Informative	Determinate	524
	Informative	Indeterminate	529

Table 3

Results for Experiment 3

Context	Position of Definite Noun Phrase	Comprehension time in msec
Direct Antecedent	Sentence-initial	462
Direct Antecedent	Senter.ce-final	463
Indirect Antecedent	Sentence-initial	493
Indirect Antecedent	Sentence-final	560

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