

Iranian English Language Bas Attitude toward Parsing of Garden-Path Sentences; Teachers and Non Teachers

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ABSTRACT

Psycholinguistic ally looking at reading comprehension, reader's process language one word at a time. Garden Path Sentences (GPSs) are part of the ambiguous sentences that are easily misunderstood even though they are all grammatical. Theories of sentence comprehension have addressed both initial parsing processes and mechanisms responsible for reanalysis. The purpose of this study was to compare the attitude of the two groups of participants in this study toward the GPSs when confronted in reading comprehension. The method employed in this research was a descriptive and a comparative one. The subjects of this study were Iranian English language BAs from the Khuzestan province, the South part of Iran, in two groups of 30, "school teachers" and "non-teachers". They were both male and female and their age ranged from 25-30 at the time of the study. A TOEFL test was administered at the beginning of the study, aiming at homogenizing the participants. The subjects were given 20 GPSs extracted from Nordquist in three phases with three different purposes. In the first phase of the experiment, they were asked to say whether the sentences are grammatical or not. Essentially as one hears or reads a sentence, his brain automatically begins to try to figure out what the next word or type of word is going to be. In the second phase, they were asked to rewrite their initial likely partial parse. There is, however, an interesting bit that arises when one is sure that a sentence is grammatically correct, but does not fit with the way his brain has parsed what it is heard already, so in the last stage, the final parse was asked. The findings obtained from Pearson correlation and t-test suggested that both groups were misled and there were no significant differences between the two in phases one and two. But there was a significant difference in the final parse of the two.

KEYWORDS: Garden Path, Reanalysis, Lingering, Ambiguity, Processing, Parse, Local Ambiguity, Global Ambiguity.

1. INTRODUCTION

Human sentence processing is a complex process governed by syntactic and language rules. The goal of all research is to discover how people understand language [1]. Essentially, as one hears or reads a sentence, their brain automatically begins to try to figure out what the next word or type of word is going to be. Sentence comprehension has to deal with ambiguity in spoken and written utterances, for example lexical, structural, and semantic ambiguities. Ambiguity is ubiquitous, but people usually resolve it so effortlessly that they don't even notice it.

Event related potentials (ERP) measure the changes in the electrical activity of specific areas of the brain that coincide temporally with specific events. When different individuals read similar sentences their brain potentials show similar effects. Three specific stages in processing are revealed by 3 specific anomalies in the trace, replicable across many individuals.

If there is a semantic anomaly in a sentence (eg the thunderstorm was ironed) then the ERP shows a deviation after 400 milliseconds in a trace taken in the middle of the brain [2]. This is known as the N400 and if a sentence has no semantic anomalies (eg the shirt was ironed) then no N400 is produced.

LITERATURE REVIEW

If a sentence contains a syntactic anomaly (e.g. the shirt was on ironed) a deviation occurs after about 200 milliseconds on a trace taken over the left frontal lobe (Broca's area). This is known as the LAN (left anterior negativity). LAN deviations are often produced in conjunction with the third trace deviation, the P600. This is a positive deviation after 600 milliseconds and is produced in response to grammatical violations - eg sentences that contain some ambiguous syntax or grammar. Garden path sentences cause a P600 but no LAN deviation. This is because there is nothing ungrammatical about the sentence; it is just not as easy to understand as it first reads. It is believed that the P600 is actually an electrophysiological marker of the garden-path effect but unfortunately it hasn't been explained exactly why or how the deviation occurs [3].

It has also been argued that, according to the garden path model, once an ambiguous sentence has been analyzed and the correct meaning ascribed, the initial incorrect interpretation is discarded. Recent studies have,

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however, indicated that initial misapprehensions do persist, and when questioned readers will retain some of these throughout [4]. There are a variety of theories about how sentences are processed and this account outlines the theory and evidence for the garden path model of sentence processing.

The garden path model of sentence processing suggests that, when encountering ambiguous sentences, only one meaning is initially processed. Then, upon reaching the end of, or a key point within, the sentence, if the meaning ascribed does not work the sentence is reprocessed until a satisfactory meaning can be ascribed. The garden path model is a two stage model. The first stage involves syntactic information only, with analysis of the semantic information being part of the second stage. Fodor and Inoue expand that garden path model to suggest that sentences are processed according to their triage hypothesis. This is described as a form of reasoning about the probable revisability of a structure [5]. It has been found that the longer the ambiguous phrase is, the more difficult processing is. So, if the error signals for a sentence is close to the head of the misanalysed phrase it is easier to recognize, than if it is several further words distant [4].

There are two types of ambiguous sentence: either there is a local ambiguity (one that is cleared up once you have heard the whole sentence) or it is a global ambiguity (one that remains even after the entire sentence has been heard). Garden Path sentences normally have local ambiguity.

When readers process a local ambiguity, they settle on one of the possible interpretations immediately, without waiting to hear or read more words that might help decide which interpretation is correct (this behavior is called incremental processing). If they are surprised by the turn the sentence really takes, processing is slowed. This is visible for example in reading times. Locally ambiguous sentences therefore have been used as test cases to investigate the influence of a number of different factors on human sentence processing. If a factor helps readers to avoid difficulty, it is clear that this factor plays a factor in sentence

The garden path model is a serial modular parsing model. It proposes that a single parse is constructed by a syntactic module. Contextual and semantic factors influence processing at a later stage and can induce re-analysis of the syntactic parse. Re-analysis is costly and leads to an observable slowdown in reading[6].

Aim:

Goal of all models of reanalysis is to describe and motivate the mechanisms used by the parser to detect errors, deduce useful information about the nature of the necessary repair from those errors, and ultimately to create successful parse. Another goal of models of reanalysis is to explain why it is that successful revision is possible for some sentences but impossible for others. High numbers of incorrect answers to the comprehension questions stem from pragmatic inference.

The general reasoning for doing this study is that previous works on how garden-path sentences are processed had barely addressed how these sentences are actually understood. There is also no data on the question of whether people understand these sentences the way we presume they should. The purpose of this study was to compare the attitude of the two groups of participants in this study toward the GPSs when confronted in reading comprehension.

Research questions and hypotheses:

The research questions investigated include;

1. Would people give an incorrect answer more frequently for (initially plausible) Garden Path sentences?
2. Do people reanalyze Garden Path sentences holistically or partially?
3. Does plausibility affect the interpretation of Garden Path sentences?
4. Is there any significant differences between “school teachers” and “non-teachers” in comprehending “garden path sentences”?

Furthermore, it was predicted that;

1. The Garden Path sentences would take longer to respond to,
2. Plausibility will affect the interpretation,
3. Garden Path sentences will be answered incorrectly more frequently,
4. “School teachers” act better on garden path sentences than “non-teachers”.

2. MATERIALS AND METHODS

The method employed in this research was a descriptive and a comparative one. In general, it is assumed that a reader who has understood a text will have a well-structured mental representation of that text. In such a case, he typically will retain the gist of a text. Thus, psycholinguistic researchers assume that most of what is remembered from a text is the result of comprehension [7]. Beyond this generality, the methods of investigating text comprehension are diverse and depend on the objective of the study. For example:

To study the meaning readers attribute to a text, methods used include recall protocols, answers to questions, judgments on text statements, and importance ratings.

To understand comprehension processes, approaches include collecting reading times as readers normally read the text, tracking eye movements and gaze duration on individual words, and recording patterns of eye movements across words.

To tap both conscious and unconscious comprehension processes, readers are periodically interrupted during comprehension and asked to complete a word-naming task as quickly as possible.

Subjects:

The subjects of this study were Iranian English language BAs from Khuzestan province, the South part of Iran, in two groups of 30, "school teachers" and "non-teachers". They were both male and female and their age ranged from 25-30 at the time of the study. All have passed the same courses in the field of teaching English.

Procedure:

A TOEFL test was administered at the beginning of the study, aiming at homogenizing the participants. The subjects were given 20 GPSs extracted from Nordquist in three phases with three different purposes [8]. In the first phase of the experiment, they were asked to say whether the sentences are grammatical or not. Essentially as one hears or reads a sentence, his brain automatically begins to try to figure out what the next word or type of word is going to be. In the second phase, they were asked to rewrite their initial likely partial parse. Not knowing whether they answers in phase one is correct or not they were to rewrite the sentences. There is, however, an interesting bit that arises when one is sure that a sentence is grammatically correct, but does not fit with the way his brain has parsed what it is heard already, so in the last stage, the final parse was asked. Here the participants know that all the sentences have been correct [9].

Material:

Material used in this study was 20 GPSs out of 40 extracted from Nordquist. The prime number few [10] .

2. Fat people eat accumulates .
3. The cotton clothing is usually made of grows in Mississippi .
4. Until the police arrest the drug dealers control the street .
5. The man who hunts ducks out on weekends .
6. When Fred eats food gets thrown .
7. Mary gave the child the dog bit a band aid .
8. The girl told the story cried .
9. I convinced her children are noisy .
10. Helen is expecting tomorrow to be a bad day .
11. The horse raced past the barn fell .
12. I know the words to that song about the queen don't rhyme .
13. She told me a little white lie will come back to haunt me .
14. The dog that I had really loved bones .
15. That Jill is never here hurts .
16. The man who whistles tunes pianos .
17. The old man the boat .
18. Have the students who failed the exam take the supplementary .
19. The raft floated down the river sank .
20. We painted the wall with cracks .
21. The tycoon sold the offshore oil tracts for a lot of money wanted to kill JR .

And the participants' answers were collected in a table like table 1 below.

Table 1.

Sentence	Initial likely partial parse	Final parse	Alternative form of original sentence
The old man the boat.	The man, who is old...	The boat is manned by the old people.	Old people man the boat.
The man whistling tunes pianos.	The man who is whistling melodies...	The man who is whistling also tunes pianos.	The whistling man tunes pianos.
The cotton clothing is made of grows in Mississippi.	The clothing, which is made of cotton, is made of...	The cotton, of which clothing is made, is grown in Mississippi.	The cotton that clothing is made of grows in Mississippi.
The complex houses married and single soldiers and their families.	The houses (meaning buildings or families), which are complicated, got married to...	Soldiers (both married and single), and their families, are housed in the complex.	The complex houses single and married soldiers and their families.
The author wrote the novel was likely to be a best-seller.	The author composed the novel...	The author wrote a comment, saying the novel was likely to be a best-seller.	The author wrote that the novel was likely to be a best-seller. or The author wrote: the novel was likely to be a best-seller.
The tomcat curled up on the cushion seemed friendly.	The tomcat curled itself up on the cushion...	The tomcat that was in a curled-up position on the cushion seemed friendly.	The tomcat, curled up on the cushion, seemed friendly.
The man returned to his house was happy.	The man came back to his house...	The man, who had been returned to his house, was happy.	The man who had been returned to his house was happy.
The government plans to raise taxes were defeated.	The government is making plans to raise taxes...	The plans of the government to raise taxes were defeated.	The government's plans to raise taxes were defeated.

3. RESULTS AND DISCUSSION

It appears that people work on sentences until they reach a point where it subjectively makes sense to them and then processing may cease [11]. These garden-path sentences somehow produce an illusion of comprehension in our participant. They will be misunderstood despite the best attempts of the comprehended to come up with a correct analysis. In this study, the author reports evidence for lingering misinterpretations using a paraphrasing methodology, which is less biased than previous methodologies. Using paraphrasing, they found that garden-path sentences are paraphrased according to a partially reanalyzed interpretation [12 and 13].

The findings obtained from Pearson correlation and t-test suggested that both groups were misled and there were no significant differences between the two in phases one and two. But there was a significant difference in the final parse of the two. Better acting of "school teachers" in phase two on garden path sentences shows that the mastery on grammar help them do better, since the focus of teaching English as a foreign language in Iran is on grammar

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