

GARDEN-PATH SENTENCES AND LANGUAGE AMBIGUITY

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Abstract

Garden-pathing is a term that originated from psycholinguistic field. As a special temporary or local ambiguity in language processing, it has been widely explored and studied from aspects of semantics, syntax, pragmatics as well as psycholinguistics and cognitive linguistics over the years, since it was first put forward by Bever in the 1970s. This paper is designed to deal with the garden path phenomenon and how it is related to ambiguity in English language. It explores the concept of garden pathing, and different views related to its definition. It also shows how parsing strategies explain the way people experience garden pathing. Finally, it surveys different types of ambiguity that occur through garden pathing. This paper aims to help learners to understand the operation of human language processing mechanism and improve their abilities to deal with ambiguities in garden path sentences, which is of great benefits to learn and understand English language.

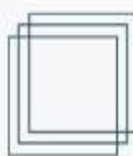
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Introduction

Language is an intricate processing mechanism that showcases just how powerful the human brain is. Languages have thousands, if not millions, of words for concepts, ideas, and things; and an infinitely adjustable protocol to combine them together to convey meaning. With such complexity, and the possibility of an infinite number of meaningful and grammatically correct sentences and phrases, it's nothing short of a miracle that human minds are not completely overwhelmed by the sheer number of ways to talk about things.

Garden-path sentences, unlike some other types of ambiguous sentences, are caused by a misinterpretation of the underlying syntactic structure of the sentence. This ambiguity is typically resolved after the entire sentence is parsed (resolving a sentence into its component parts and describing their syntactic roles). Thus, such sentences are said to be 'locally ambiguous', as opposed to globally ambiguous sentences, where the ambiguity is not resolved even after the entire sentence is parsed, thus requiring external clarification.

Carroll (2004) argues that we interpret a sentence in a particular way only to find out near the end that we misinterpreted it. The subjective impression is that of being led down a garden path until discovering at the end we took the wrong path and have to retrace our efforts. It is called the garden path effect.



Defining Garden Pathing

A garden-path sentence is a grammatically correct sentence that starts in such a way that a reader's most likely interpretation will be incorrect; the reader is lured into a parse that turns out to be a dead end or yields a clearly unintended meaning. "Garden path" refers to the saying "to be led down [or up] the garden path", meaning to be deceived, tricked, or seduced. In *A Dictionary of Modern English Usage*, Fowler (1926) describes such sentences as unwittingly laying a "false scent".

Such a sentence leads the reader toward a seemingly familiar meaning that is actually not the one intended. It is a special type of sentence that creates a momentarily ambiguous interpretation because it contains a word or phrase that can be interpreted in multiple ways, causing the reader to begin to believe that a phrase will mean one thing when in reality it means something else. When read, the sentence seems ungrammatical, makes almost no sense, and often requires rereading so that its meaning may be fully understood after careful parsing. Dynel (2009) cites the classic example of a garden-path sentence is attributed to Thomas Bever:

The horse raced past the barn fell

The sentence above is hard to parse because race can be interpreted as a finite verb or as a passive participle. The reader initially interprets raced as the main verb in the simple past, but when the reader encounters fell, they are forced to re-analyse the sentence, concluding that raced is being used as a passive participle and horse is the direct object of the subordinate clause... Bever himself (1970) explicates that this sentence could be replaced by "The horse that was raced past the barn fell", where that was raced past the barn tells the reader which horse is under discussion. Such examples of initial ambiguity resulting from a "reduced relative with [a] potentially intransitive verb" ("The horse raced in the barn fell.") can be contrasted with the lack of ambiguity for a non-reduced relative ("The horse that was raced in the barn fell.") or with a reduced relative with an unambiguously transitive verb "The horse frightened in the barn fell."

As an interesting language phenomenon, garden path phenomenon has been inevitably explored and defined by many scholars from different aspects based on their research emphasis. In 1970, psycholinguist Bever firstly put forward garden path phenomenon and defined that: "A sentence is first comprehended in the conventional way until it is only later discovered that the first understanding is incorrect. Then on the purpose of re-understanding, non-conventional means are used to reprocess the input language by going back to the bifurcation" (Bever 1970: 279).

Scovel (1998: 65) gives it another definition to garden pathing from a psycholinguistic perspective:

"The general tendency for all listeners and readers to make increasingly confident predictions about the meaning of a sentence as it progresses is well-attested in psycholinguistics and is colorfully called garden-pathing. One well-documented example of this phenomenon is the way comprehension is temporarily impeded when the listener or reader meanders down the wrong garden path in comprehending a string of words".

According to this definition, it seems that we construct syntactic representations usually from the beginning of the sentences to the end. Therefore, when we listen or



read a word, we will think about its influence on the meaning of the following information and before reading the following information, we will make a number of assumptions about how the sentence will proceed. It should be no wonder that we misinterpret garden path sentence due to these assumptions in our minds. In fact, it is believed that communication than in written text because of the stress, tone, and intonation of speech. Ferreira defined garden path as “syntactically challenging but essentially unambiguous sentences” (Ferreira 2003: 164), which indicates that garden path sentences are not truly ambiguous but difficult to interpret due to some syntactic factors. However, Ferreira’s definition seems to be too narrow because there are more than syntactic factors but many other whatever factors to lead to this temporary ambiguity.

According to the different definitions above, we can find an interesting feature of garden path phenomenon: It is often the case that the interpretation that people are reluctant to accept is correct in garden path sentence. Garden path phenomenon is less common in spoken communication than in written text because of the stress, tone, and intonation of speech.

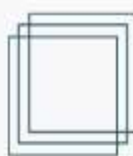
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Parsing

When reading a sentence, readers will analyse the words and phrases they see and make inferences about the sentence’s grammatical structure and meaning in a process called parsing. Generally, readers will parse the sentence chunks at a time and will try to interpret the meaning of the sentence at each interval. As readers are given more information, they make an assumption of the contents and meaning of the whole sentence. With each new portion of the sentence encountered, they will try to make that part make sense with the sentence structures that they have already interpreted and their assumption about the rest of the sentence. The garden-path sentence effect occurs when the sentence has a phrase or word with an ambiguous meaning that the reader interprets in a certain way and, when they read the whole sentence, there is a difference in what has been read and what was expected. The reader must then read and evaluate the sentence again to understand its meaning. The sentence may be parsed and interpreted in different ways due to the influence of pragmatics, semantics, or other factors describing the extralinguistic context. (Reisberg, 2010)

2.2. Parsing strategies

Hickok (1993) states that various strategies can be used when parsing a sentence, and there is much debate over which parsing strategy humans use. Differences in parsing strategies can be seen from the effects of a reader attempting to parse a part of a sentence that is ambiguous in its syntax or meaning. For this reason, garden-path sentences are often studied as a way to test which strategy humans use. Two debated parsing strategies that humans are thought to use are serial and parallel parsing.



Serial parsing is where the reader makes one interpretation of the ambiguity and continues to parse the sentence in the context of that interpretation. The reader will continue to use the initial interpretation as reference for future parsing until disambiguating information is given. (Meng and Bader, 2000).

Parallel parsing is where the reader recognizes and generates multiple interpretations of the sentence and stores them until disambiguating information is given, at which point only the correct interpretation is maintained. (ibid)

3. Permanent Ambiguity and Temporary Ambiguity

There are two kinds of ambiguous sentences including permanent ambiguity and temporary ambiguity, or, global ambiguity and local ambiguity. Permanent ambiguity or global ambiguity is a special phenomenon in language, in which, the form or the structure is grammatically accepted but its content has two or more meanings or illustrations. Garden path phenomenon is the temporary ambiguity which could be clearly illustrated by the following examples:

(2) Jack saw his mother with a telescope;

(3) The girl read the article smiled.

Sentence (2) is a permanent ambiguity which can be comprehended that Jack used a telescope to see his mother or that Jack saw his mother holding a telescope. In contrast, sentence (3) is a temporary ambiguity but not true ambiguity. When comprehending sentence (3), at first we have a strong tendency to read it as “the girl read the article”. But when we get to the word “smiled”, we are confused because the sentence has no room for an extra VP (Verb Phrase). So we reconstruct the sentence to make “smiled” main verb then reread it as the girl who read the article smiled. Through the above two sentences, it could be concluded that garden path phenomenon is temporary ambiguity. Only we distinguish garden path phenomenon from permanent ambiguity can we explore this phenomenon well.

4. Types of ambiguity result related to garden pathing

If a sentence is ambiguous, it can have more than one meaning. There are generally three types of ambiguity: syntactic, semantic, and pragmatic ambiguity.

4.1. Syntactic ambiguity

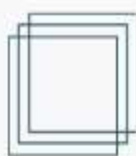
The garden path phenomenon in syntax is mostly caused by the complexity of the sentence. There are mainly the following three triggering factors. Firstly, the guide word is omitted in complex sentence. This type of garden path phenomenon mainly occurs in object clause and attributive clause as shown below.

(4) She told her daughter a dream could be achieved;

(5) The old man told the story complained to his son.

In sentence (4), the guide word of this object clause is omitted. Thus, at first people will regard the noun phrase “a dream” as the object of a simple sentence, but later will realize that in fact “a dream” is the subject of the object clause, which triggers garden path phenomenon. Sentence (5) is an attributive clause, which omits the relative word “who” and verb “was”. So when readers do not get to the verb “complained”, they are inclined to comprehend the sentence as the simple SVO (Subject-Verb-Object) structure. Until they read “complained”, they are aware of this misinterpretation.

As for the above examples, if the omitted components are inserted back, there will be no temporary garden path ambiguity. She told her daughter (that) a dream could be achieved. The old man (who was) told the story complained to his son.



Secondly, in a complete sentence, other longer sentence components are inserted, as in (6)

(6) The doctor told the patient that he has trouble with to leave
(Yang 2013: 77).

In this sentence, “the doctor told the patient to leave” is the complete structure of the main clause to which an attributive clause is inserted to modify the antecedent “the patient”. Therefore, it causes difficulties to understand the whole sentence, namely garden path phenomenon occurs.

Thirdly, there are various possible combinations of words, as shown below:

(7) Without her efforts would be in vain.

In fact, this sentence may not be garden path sentence for listeners because of the speakers’ appropriate stops, stress, tone, and intonation. But for the non-native speakers of English, the interpretation will be a little confused and difficult. This kind of temporary ambiguity can be canceled by adding a comma to the stop of the sentence.

(7 a) Without her, efforts would be in vain.

4.2. Semantic ambiguity

It is believed that the semantic relations of internal components of sentences are important triggering factors of garden path phenomenon. There are mainly two causes in semantics. The first factor is the default of semantic case role. Sentence comprehension is based on language perception and mental lexicon. Mental lexicon is the reality reflection on the attitude towards world and culture, which plays a great role in the assignment of the semantic case role. Semantic case role is the vocabulary that people will take for granted, which leads to garden path phenomenon.

The performer sent the flowers was very pleased

The florist sent the flowers was very pleased

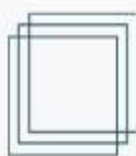
(Wang 2013: 94)

The occurring rate of garden path sentence in sentence (9) is much higher than sentence (8). Because it is always believed that “florist” is more likely to be treated as the agent of flowers’ sending than “performer”. On the contrary, “performer” is more likely to be treated as the object of flowers’ sending than “florist”.

The second factor is the influence of polysemous words. In English, there are many polysemes, i.e. one word with different meanings and speeches. For a polyseme, the meaning more frequently used is much easier recognized and accepted. Therefore, when people comprehend sentence, they tend to choose the common meanings. But when the right meaning is inconsistent with the common meanings, garden path phenomenon will occur.

The old coach the tennis team.

When reading sentence (10), most people will regard “the old coach” as the common noun phrase. But in this sentence “coach” is not the noun (someone who trains a person or team in a sport), but is the transitive verb (to teach a person or team the skills they need for a sport). Therefore, sentence (10) is likely to be garden path sentence.



Pragmatic Ambiguity

The pragmatic factors of garden path phenomenon are explored mainly from the perspective of Relevance Theory proposed by Dan Sperber and Deirdre Wilson (1996). According to Relevance Theory, that people comprehend utterances is on the premise of the cognitive presumption and follows the principle of relevance defined as “every act of ostensive communication communicates the presumption of its own optimal relevance” (ibid: 158). The so-called optimal relevance is that adequate contextual effects can be obtained after making appropriate efforts to comprehend utterances. One of the basic principles of human behavior is labor-saving, namely principle of least effort. (Jiang and Yin 2016: 120).

In the sentence (11), there are two kinds of interpretation:

(11) I saw that gasoline can explode. And a brand new gasoline can it was too

(a) I saw that it is possible for gasoline to explode;

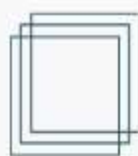
(b) I saw that can of gasoline explode.

In general, people are inclined to interpret the former part of sentence (11) as (a), but after the sentence “And a brand new gasoline can it was too” occurs to be its context, readers have to go back to reread it and find (b) is right. If we just explore the parsing process of the former part of the sentence (11) alone, we find that when readers get to “I saw that...”, there will be two interpretations of “that”: a guide word of object clause or a demonstrative pronoun to modify the following noun. But because the form of demonstrative pronoun needs special context to support and this special context later occurs, it takes more efforts to the second interpretation. In contrast, for the first interpretation, the form of the guide word of object clause does not need special context to support thus does not take more efforts, which gives the priority to the first interpretation and leads to temporary garden path ambiguity.

Conclusions

Although garden pathing is a complex phenomenon in English language but it is also an interesting phenomenon that adds difficulty to people’s comprehension. To be more specific, when interpreting garden path sentence, people are inclined to misinterpret the sentence at the very start and finally have to go back to comprehend it and get another new interpretation. It is found that the ambiguity the results from garden pathing can be attributed to three factors: syntax, semantics, and pragmatics. All these aspects of language need to be exploited by speakers of a language in order to avoid the risk of garden pathing interpretation.

This study could be of considerable significance both theoretically and practically. Through the exploration of how this sort of sentences is mistakenly parsed, learners can have a good knowledge of the operation of human language processing mechanism. Furthermore, some speaker or writers use garden path sentences deliberately in order to guide their interpretation to something intended or to get their attention to a certain element in the sentence. Hence, understanding such techniques would help producers and receivers of the language to make a better use of their language.



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