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Cognitive Psychology and Applied Linguistics a timely rapprochement

ABSTRACT: This paper reviews several central theoretical constructs in contemporary cognitive psychology and argues that such knowledge can be useful for the applied linguist. An example of such a use is then discussed: the study of the way consumers draw inferences about products from advertisements and then remember those inferences as facts. A second example of the influence of the wording of a question on eyewitness memory is also examined.

1. INTRODUCTION

In recent years it is becoming more difficult totally to separate linguistics and psycholinguistics, or, more generally, linguistics and cognitive psychology. To truly understand how language works requires the consideration of psychological factors, such as the intention of the speaker, the context of the utterance, and the knowledge in the mind of the hearer. This knowledge and its effects on comprehension and memory are the subject of this article. I will argue that applied linguists can benefit from some knowledge of some current research in cognitive psychology. First, some concepts from current psycholinguistic research will be briefly discussed. Next, I will demonstrate the application of these constructs in studies of two issues in applied linguistics, namely, the questions of the effects of language in deceptive advertising and eyewitness memory.

2. SOME RELEVANT CONCEPTS FROM COGNITIVE PSYCHOLOGY

2.1 The Source of Meaning

The most common current theoretical position in cognitive psychology and psycholinguistics can be described as «interactionist», that is, neither empiricist like the Behaviorists nor nativist like Chomsky. The mind is active in the processing of information from the world. The meaning of this information emerges from the interaction of the information and the active mind interpreting that information. Therefore, the meaning is neither a property of the words that contain the stimulus nor of the mind that comprehends them. Rather, it exists only after the linguistic stimulus and the activities of the mind interact with each other. The meaning then emerges from this interaction and becomes the basis of the construction of the memory representation of that new linguistic information.

2.2 The Constructive Nature of Memory

Basic research in cognitive psychology in recent years has shown that the nature of memory is constructive (e.g., Spiro, 1980). Our memories do not record everything verbatim like a tape recorder or computer that stores information literally and later retrieves it in the

same form. On the contrary, memory interprets everything, constructing representations of these interpretations in order to store them in permanent memory. It is these stored interpretations that we remember. This phenomenon has been demonstrated to be very general across a wide variety of tasks with both linguistic and nonlinguistic materials (see Harris, 1981, and Harris & Monaco, 1978, for detailed discussions of these issues).

2.3 The Schema as a Knowledge Structure

Another important theoretical notion coming out of the last five years or so of research in cognitive psychology is the **schema**. First introduced by computer scientists studying questions of natural language processing and artificial intelligence, the construct has become very important in cognitive psychology (see Rumelhart, 1980, for a detailed discussion of the schema).

Rather informally, a schema may be defined as «a unit of organized knowledge about events, situations, or objects» (Moates & Schumacher, 1980, p. 33). As such, schemas guide the acceptance of new information entering from the senses. Schemas also guide the retrieval of old information stored in permanent memory.

For example, suppose that you have a schema of Portuguese people, that is, a body of knowledge about people from that particular country. Your schema could include factual information, particular personal experiences, stereotypical biases, etc. When someone says to you «That new professor is from Portugal», your knowledge schema about Portuguese people is retrieved from memory to help understand this new information. This schema guides the acceptance of new information; for example, if your schema about Portuguese people includes the beliefs that they are stupid and lazy, you probably will be more likely to attend to and remember details about the new professor which are consistent with that schema (e.g., he arrives late) and more likely not to notice or disregard information about him that is inconsistent with the schema (e.g., he has written 25 books).

As well as guiding acceptance of new information, your schema will guide the retrieval of old information from permanent memory, i.e., you will be more likely to retrieve information compatible with your schema, for example, remembering two stupid Portuguese people

you have known and forgetting the smart ones, because they do not fit the schema as well. This example is, of course, greatly oversimplified for explanatory purposes, but it serves to illustrate the principles.

In this way schemas guide the construction of inferences by the person hearing or reading language. The specific nature of these inferences is different depending on the particular schemas in our memory. The inferences that are constructed are thus a product in part of the knowledge schemas in the memory of the person doing the inferring. They are also, of course, in part a product of the language of the stimulus itself.

2.4 Linguistic Influences in the Construction of Inferences

Psycholinguistics research in the last ten years has shown that even very small changes in the wording of an utterance can greatly affect the way the information it contains is remembered. For example, many people that hear (1) remember that they had heard (2). This happens not because they they did not understand.

(1) The prisoner was able to escape from jail.

(2) The prisoner escaped from jail.

(1) correctly but rather, because, upon hearing, (1) they interpreted it according to their schemas about prisons and prisoners that had been retrieved to aid in comprehension. The final memory representation of this sentence is thus a constructed interpretation, which often includes the inference that, since the prisoner was able to escape from jail, he must have done so. Although this consequence may be highly likely, depending on the context, it is not certain; it is possible, for example, that the prisoner did not know that he had the opportunity to escape or that he was too stupid to take advantage of it.

This type of inference is called a pragmatic inference, because it involves more than was present linguistically in the utterance. Whether or not a given inference is actually made will depend on the context of the utterance and the knowledge in the memory of the hearer or reader (see above), instead of merely being a product of the linguistic properties of the utterance.

Our laboratory, and others as well, have shown that people make such inferences in a wide variety of situations with a wide variety of linguistic materials (Harris, 1981). Moreover, they remember that these inferences had been directly stated as facts in the original utterance (Brewer, 1977). They often seem to have no realization that this information was constructed by themselves, not spoken by the speaker or written by the writer. This ability to construct inferences is typically very useful and necessary in normal language comprehension. There are times, however, when it becomes important to distinguish information that was stated directly from that which was constructed upon hearing or reading the language. Some such cases involve important questions of linguistics. We will now examine two examples of research using the concepts and methods of cognitive psychology to study such problems of applied linguistics.

3. THE PROBLEM OF MISLEADING ADVERTISING

One such issue is the processing of advertisements by the consumer prior to making a purchase. If consumers in fact infer more than an ad claims directly, it is thus possible that an advertiser could imply that the product is better than it really is — **without lying**, because it is the consumer who is concluding the false information, not the advertiser who is stating it. There are many ways that an ad can imply something that is not necessarily true without stating it directly. (See Preston, 1975, for a more thorough examination of these issues).

Before looking at examples of such claims, it is worth mentioning one important point about the relationship of truth and comprehension. That is, literal truth is not the opposite of deception, or misleadingness. An ad can be false without being misleading, as in the case of a humorous ad that state something ridiculous with no intention that anyone would believe it, e.g., (3). Literally (3) is false,

(3) These jeans will make you fly off into the sunset into the arms of your sweetheart.

but it seems unlikely that anyone would be terribly suprised or disappointed when their jeans did not lift them off the ground.

On the other hand, an ad can mislead without being literally false; it is this type of ad that is discussed below. Although truth may be a linguistic, and sometimes legal, question, misleadingness, or deception, is a psychological question, specifically one dealing with the processing of the information in the ad, because what is important is the interpretation constructed by the consumer, regardless of the semantic and syntactic properties of the language of the ad itself.

3.1 How to Mislead without Lying

One way of implying something without stating it directly is by the use of hedge words. These are words which seriously weaken the literal truth of a claim but may still leave a strong implication, e.g., (4) does not insure that the toothpaste will **defeat** or **prevent** cavities, only that it will **fight** them. Similarly,

(4) Our toothpaste fights cavities.

(5) This beer could be the best you've ever tasted.

(5) does not say that the beer is the tastiest, only that it **may** be.

A second type of true-but-potentially-misleading claim is the case where comparative adjectives or adverbs are used without giving the subject of the deleted deep-structure sentence, e.g., (6) would

(6) Ogo Detergent will make your clothes cleaner.

not be false if the deleted clause were «than washing with coal dust will» or «than washing with no detergent will». When the hearer hears a comparative adjective or adverb with no basis of comparison given, he/she uses relevant knowledge schemas to infer a probable basis (e.g., «than using any other brand») and uses that inferred information to understand the ad.

Two imperatives may be juxtaposed so as to imply dubious a causal relationship between the two actions, e.g., (7) does not assure

(7) Don't catch colds this winter. Take our pills.

that the pills will prevent colds. It is merely two imperatives spoken sequentially. Our minds infer the causal relationship.

A negative question can imply an affirmative response, which may or may not be true, e.g., (8).

(8) Isn't fine quality leather important for your family's shoes?

The inappropriate, incomplete, or inadequate reporting of statistical results of surveys and scientific studies may easily mislead the consumer. For example, giving only the number of people responding in a given manner, without reporting the sample size or percentage, or vice versa, presents only a portion of the picture. Thus (9) would still be true even

(9) 75% of the doctors recommend our brand.

if only four people were questioned and all were related to the manufacturer!

In our psychological laboratory at Kansas State University (USA) we have studied such advertisements, in order to determine if they are in fact misleading, and also to develop ways of teaching people to avoid making unwarranted inferences beyond what is directly stated.

3.2 Research on Inference Drawn from Ads

Method

To best explain this research, the procedure of a typical experiment will be described. Twenty-four short ads roughly comparable in length to the 30-second spots on television were written. Although they described fictitious products, they were of the type advertised daily on radio and television in the United States, Brazil, and many other countries.

Each ad had two versions, identical except that in one a critical claim was directly asserted, while in the other the same claim was only implied. In addition, two test sentences were written. One was a paraphrase of the critical information that was either asserted or implied in the ad. The other sentence was a control item, which was of either false (12 items) or indeterminate (12 items) in truth value. These items were included to avoid the appearance to the subject of too many true items. A sample set of materials appears below (10-13).

- (10) Asserted-claim Version: Aren't you tired of the sniffles and runny noses all winter? Tired of always feeling less than your best? Taking Eradicold Pills as directed will get you through a whole winter without colds.
- (11) Implied-claim Version: Aren't you tired of the sniffles and runny noses all winter? Tired of always feeling less than your best? Get through a whole winter colds. Take Eradicold Pills as directed.
- (12) Test Sentence (Critical): If you take Eradicold Pills as directed, you will not have any colds this winter.
- (13) Test Sentence (Control-Indeterminate): Eradicold Pills have been proven more effective in laboratory tests than Anacin or Bayer.

There were thus two lists of 24 stimulus ads each, with 12 claims directly asserted and 12 pragmatically implied in each list. An ad that appeared in its asserted version in one list appeared in its implied form in the other. There was one list of 48 test sentences, 24 over information either asserted or implied in the critical claims and 24 over the control items. The subjects were North American university students enrolled in Introductory Psychology classes; they received extra course points for participating. After being told this was an experiment on the comprehension and evaluation of commercials, they heard one of the two tape-recorded lists of 24 ads. After hearing the ads, they received a list of the 48 test sentences and evaluated each of them on a five-point scale (1 = false, 2 = probably false, 3 = indeterminate, 4 = probably true, 5 = true), according to their memory for the ads.

3.2.2 Results and Conclusions

The first result of these studies was that subjects indeed made the expected inferences from the implied claims in the ads and subsequently remembered these inferences as facts (Harris, 1977). Frequently they were not able to discriminate whether they had heard the claim implied or directly asserted. Thus it is possible to imply some information about a product without stating it directly and

produce the same effect on the consumer's perception that would have occurred if the information had been asserted as a fact.

In further examining this issue, we tried to develop some methods of teaching people to avoid making possibly unwarranted inferences from ads. In these studies of such training (e.g., Bruno & Harris, 1980), subjects received a short instruction session, which taught them some specific linguistic constructions (discussed above) which could invite unwarranted inferences. The subjects practiced identifying such inferences in sample ads similar to the stimulus ads they were to hear later. The experimenter insured that each person in the group responded aloud to at least one item. This point of the subjects actively responding in the training was very important. This type of training did affect the answers made later to the memory task described above; subjects responses indicated that they could discriminate asserted and implied claims better than a control group that also received an interactive training session but one that did not relate at all to the topic of inferences. This discrimination showed some tendency of becoming ever sharper over a ten-day period with repeated testing. In conditions where subjects heard or read only a set of instructions about avoiding the pitfalls of unwarranted inference-drawing, responses on the memory task did not differ from those made by a control group that received no training or instructions at all.

This research project was continued in examining different types of memory measures and using real commercials in real television programs viewed in the home (Harris, et al, 1980). This type of research has some clear application and usefulness for people designing consumer education materials. See Harris, Dubitsky, & Bruno (1982) for a review of the entire project in more detail.

4. THE PROBLEM OF LANGUAGE AND EYEWITNESS MEMORY

A second example, described in less detail, of applied linguistic research that uses the theory and method of cognitive psychology is the work of Elizabeth Loftus and her colleagues at the University of Washington. They have conducted an active research program over the last decade studying the problem of eyewitness memory. In a typical experiment, subjects see a short film of some event like an auto accident and later respond to questions about it. Loftus has demons-

trated that even very small changes in the wording of the question can influence the subject's memory for the event. For example, using a definite article (15) rather than an indefinite article (14) caused more subjects to respond that they saw a broken headlight, even though in fact

(14) Did you see a broken headlight?

(15) Did you see the broken headlight?

none had existed in the film. In this case they retrieved some knowledge schemas about automobile accidents; a broken headlight is very compatible with such a schema. For this reason, and because the use of the definite article generally presupposes the existence of a particular referent readily known to speaker and hearer, the hearer inferred, without realizing the error, that there was a broken headlight.

Loftus also demonstrated that the wording of such questions can have a longer-term effect. For example, Loftus and Palmer (1974) found that subjects questioned with (16), compared to those questioned with (17), both gave a faster average speed for the car questioned shortly after **and** were more likely

(16) About how fast was the car going when it smashed into the other car?

(17) About how fast was the car going when it hit the other car?

to falsely remember one week later that there was broken glass (in fact there was none). Thus the schematic knowledge brought to bear in comprehension of the question differed somewhat in the «smashed» and «hit» cases and thus altered the memory representation being constructed and stored in a way that affected information retrieved one week later.

That fact that eyewitness memory is so subject to distortion by the wording of questions asked in the courtroom or in pretrial questioning has important ramifications both for the legal process and the study of memory and language. See Loftus' (1979) book for a more detailed discussion of her research program and these issues in general.

5. FINAL COMMENTS

Obviously there are many more actual and potential applications of cognitive psychology to applied linguistics than the two described here. They serve only to illustrate some specific ways of implementing this promising, if still fragile and tentative, coming together of the two disciplines.

NOTES

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