

Experimental Study on the Cognitive Processing of Utterance Meaning

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Abstract—The recent controversial issue in pragmatics is concerned with the cognitive processing of “what is said” which is an important part of utterance meaning. There exist different assumptions and proposing patterns on utterance cognition. Experiments 1 and 2 show that Chinese participants intuitively take enriched meaning as “what is said” even after a short tutorial on the distinction of minimal meaning and enriched meaning. Experiment 3 support the RP pattern that minimal and enriched meanings occur at the same time and compete in the sense that the enriched meaning will reach the threshold level for activation before the minimal one. It is of great theoretical significance to test which of the existing assumptions and patterns the Chinese cognitive processing fits. This would help lay a sound theoretical foundation of cognitive pragmatics.

Keywords—utterance meaning; what is said; cognitive processing; pragmatic cognition

I. THE COGNITIVE ASSUMPTIONS OF “WHAT IS SAID”

The notion of “what is said” is one of the most important ideas in pragmatics. When a speaker utters something, he frequently means beyond what is said. In traditional Gricean view, a speaker’s meaning has two components: what is said and what is implicated [1]. Pragmatic factors play a minor role in “what is said”.

Gricean view has been challenged by Relevance theorists in that “what is said” does not necessarily confine to the sentence meaning because sometimes the sentence meaning is pragmatically inadequate and needs to be enriched to represent “what is said” [2]. Since sentence meaning and what is said cannot exactly coincide, enriched meaning occurs at the level of what is said.

Récanati believes that people can easily derive a criterion for telling when a pragmatically determined aspect of meaning is a part of what is said and when is not. So he proposes his “Availability Principle” to argue that to determine whether the enriched meaning is what is said depends on people’s “pre-theoretical intuition” [3].

Whether enriched meaning takes place at the level of what is said or at the level of what is implicated, still needs further exploration even experimental testing.

II. RELATED COGNITIVE EXPERIMENTS ON “WHAT IS SAID”

Among the latest studies in experimental pragmatics, there are three researches closely related to my study.

Based on Récanati’s Availability Principle, Gibbs and Moise’s experiments were designed to examine people’s intuition about the distinction between what was said and what was implicated [4]. Their first experiment was designed to test people’s intuitive preference of what was said by presenting subjects isolated contextless sentences with two possible interpretations, one a minimal and the other an enriched interpretation. In this off-line task, subjects were asked to decide minimal meaning and enriched meaning, which one could best represent what is said. Enriched meanings turned to be favored by a large margin. Then a tutorial was given that what was said reflected the minimal meaning. They aimed at investigating whether it was possible to train people to favor the minimal interpretations to represent what was said. But the tutorial didn’t work. Their reason was that people’s intuition was uneducable. However, I saw the flaw of the instruction and of the tutorial. First, the instruction told the participants that “This experiments examine your understanding of the meaning of what speakers say when uttering certain sentences”, and then it asked subjects to determine “what speakers might have said when uttering these sentences” and finally to choose “the paraphrase that best reflected what each sentence said.” [4] Subjects would be confused by the instruction, because they did not know whether to choose the speaker’s meaning, speaker’s intention or the sentence meaning. Presumably they would choose the frequently adopted meaning or the common meaning. Then the experiment was repeated. One thing to be noticed here is that subjects were not directly told that minimal meaning could represent what was said. Moreover they were not instructed to choose minimal meaning. So they would remain their own opinion of what they should do in the previous experiment. In their third experiment when subjects were exposed to the sentences (same sentences used in the previous two experiments) with context. They chose enriched meanings over implicatures to correspond to what was said. Subjects invariably took enriched meanings as what was said, and only chose minimal meanings in contexts that favored minimal interpretations. Deciding what is said, to some degree, depends on context. Their results strongly suggested that

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people did not equate a minimal meaning with what was said, and they assumed that enriched meaning played a significant role in determining what was said. So they concluded that pragmatics strongly influenced people's understanding of what speaker's both said and implicated. According to Gibbs & Moise's research, the Gricean view of speaker meaning can be revised like the following chart.

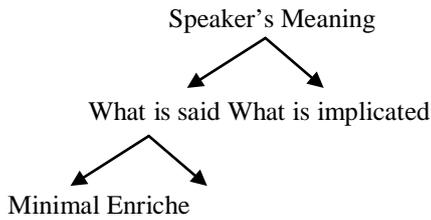


Fig. 1. The revised view of speaker's meaning

Nicolle and Clark partly replicated G&M's experiments [5]. They adopted similar sentences and contexts with that adopted by G&M. Then they invited three groups of subjects to select "the paraphrase that best reflects what each sentence said" with G&M's instruction, "the paraphrase that best reflects what the speaker's words meant" and "the paraphrase that best reflects what the speaker wanted to communicate" respectively [5]. There was no significant difference between the choices of the subjects in these three groups. Their results failed to confirm G&M's claim. They discovered that people could not intuitively separate what was said from what was implicated. One reason is that G&M's instruction to participants did not clearly inform participants of what to select since the notion of what is said varies from person to person. So when Nicolle & Clark used the same unsatisfactory instruction and procedure as that of G&M to conduct the same experiments, it is natural for them to find opposite result. That is people cannot intuitively distinguish what is said and what is implicated because of the vagueness and unclearness of the instruction. In their experiments with three instruction conditions, subjects were not alert of paying attention to different aspects of speaker's utterance. Since subjects had not received any prior training of pragmatics, it was hard for them to distinguish what was said, what was communicated and what the speaker's words meant. If they could not clearly understand the experiment instruction, experimental results were not reliable. N&C then provided a short tutorial on the distinction between "what is said" and "what is communicated" and conducted their experiment again. The results demonstrated that participants could easily be made aware of "what is said" as something distinct from "what is communicated". They designed more off-line experiments and found that without tutorial people invariably favored implicatures than the enriched interpretations. They also found that particularized implicatures were preferred to the explicatures. So G&M and N&C all agreed that minimal interpretations were disfavored.

Neither G&M nor N&C explored the process of pragmatic proposition computation. They both focused on the outcome of the processing. So Bezuidenhout and Cutting did the on-line experiments to test the predictions of three rival pragmatic processing patterns [6].

They first attempted to collaborate N&C's off-line experiments with three instruction conditions and found out that subjects were relatively insensitive to the distinction between what was said and what was communicated, which supported N&C's findings. They also confirmed that minimal paraphrases were rarely chosen. But they doubted that the off-line experiments could not show the genuine picture of processing utterance. Disfavoring minimal meaning did not equal to no recovery of it. Therefore online measures were needed to draw any conclusion about the stages in processing and the role of minimal meaning.

There are three competing pragmatic processing patterns proposed by Bezuidenhout and Cutting [6].

- ① LFS (Literal First, Serial Pattern): a hearer must first recover the minimal proposition expressed by an utterance before engaging in any further pragmatic processing.
- ② LPP (Local Pragmatic Processing Pattern): the interpretation that is built will be in line with the contextual bias, and so a minimal interpretation will only be constructed if the context is biased in this way.
- ③ RP: (Rank Parallel Pattern): minimal and enriched meanings compete in the sense that the enriched meaning will reach the threshold level for activation before the minimal.

Bezuidenhout and Cutting designed an online experiment to collect subjects' response time of target sentences reading under contexts, namely minimal and enriched contexts, and the response time of final sentences match/mismatch judgment. They claimed that their data were in line with the RP Pattern. RP Pattern claimed that minimal and enriched meanings were simultaneously processed but the enriched interpretation was usually more accessible.

Since no agreement was achieved on this issue, further researches are still needed to triangulate the previous experimental results in literature and to re-test the three cognitive patterns.

III. EXPERIMENT DESIGN

I design 30 sentences of five kinds, namely cardinal utterance, such as *Mary has three children*; possession utterance, such as *He broke a finger yesterday*; scalar utterance, such as *Everybody went to Paris*; time-distance utterance, such as *It will take us some time to get there*; and perfective utterance, such as *I have had breakfast*. Every sentence is presented with two interpretations (minimal and enriched) as the instrument for the first two experiments. These sentences are presented in a random order in a booklet for Experiments 1 and 2.

Then for Experiment 3, all the above 30 sentences were then put at the end of a story context in Chinese. For each target sentence I designed 2 story contexts, one was biased towards a minimal interpretation of the sentence, and the other was biased towards a minimal interpretation. Each story and sentence is followed by two choices, minimal interpretation and enriched interpretation.

All the online experiments were conducted with DMDX software on the computer in the Experimental Linguistic Laboratory. It was used to present testing materials and to measure participants' reading and response time. Also SPSS 13.0 was employed to do statistical analysis.

IV. EXPERIMENT 1

Each participant was given a booklet that contained the instructions as that of G&M and the experimental materials. The participants were told that this experiment wanted them to determine what the speaker might have said when uttering these sentences. In order to always remind them of choosing what was said, "What the speaker said is" was added at the beginning of every minimal and enriched interpretation.

This experiment is mainly a replication of G&M's first experiment to generally test what people intuitively favor to represent what is said, minimal meaning or enriched meaning? The data shows that the frequency of choosing minimal meanings is 270, taking up 36% of the total utterances, while the frequency of choosing enriched meanings is 480, taking up 64% of the total. With SPSS, I find a significant effect. (T value $4.876 > T$ critical 2.306 , $p \leq 0.05$). The proportion of the frequency of choosing enriched meaning to represent what is said is significantly above that of choosing minimal meaning at 95% confidence interval.

These results imply that most of the participants intuitively regard enriched meaning as what is said, which supports Gibbs and Moise's (1997) conclusion that people do not equate a minimal meaning with what is said, and enriched meaning plays a significant role in determining what is said.

After taking a second thought of the experimental materials, I find that the contextless utterances are very commonly encountered in our everyday life. Even though there is no context provided here, the participants may unconsciously process the utterance in their imaginary context. In fact, the daily utterances are used to express enriched meanings with a higher frequency than to express minimal meanings. That could be partly why people favor enriched meaning as what is said.

V. EXPERIMENT 2

The purpose of offline experiment 2 was to check whether it was possible to train people's intuition to recognize the minimal aspect of "what is said" with a short tutorial almost the same as G&M's. In G&M's experiment, it was proved that when people were specifically alerted to the minimal meaning, they still believed that enriched meaning was more suitable to represent what was said. So my experiment was meant to verify the validity and reliability of their experiment.

Data shows that the frequency of choosing minimal meanings is 429, taking up 57.2% of the total utterances, while the frequency of choosing enriched meanings is 321, taking up 42.8% of the total. A significant difference between the frequency of choosing minimal paraphrase and that of enriched paraphrase was found (T value $5.027 > T$ critical 2.447 , $p \leq 0.05$). The proportion of frequency of choosing enriched meaning to represent what is said is significantly

above that of minimal meaning at 95% confidence interval, except for cardinal sentences. That means that participant did not recognize the minimal aspect of given utterance. What is said is not for the sake of saying something, but for the speaker's intention behind saying. So they were always reading between lines and comprehending beyond saying. But they also committed that even though enriched meanings were more frequently used than minimal meanings, there existed cases in which minimal meanings were conveyed, so based on this thought, they accepted the minimal meaning to represent what is said. From the post-experiment interview, I see that both minimal and enriched interpretations were stored in people's mind. They judged what was said not from linguistic point of view but from languages in use. For the given utterances, they thought in some cases, the enriched meaning was what was said, while in others, minimal meaning was the best representative. So it is hard to ask subjects to judge experimental contextless sentences as they were; they themselves added a context from their minds to each sentence and then gave their judgments. Here I assume that in people's cognitive system, utterances are context-bound. No utterance could be isolated from contexts.

VI. EXPERIMENT 3

Offline experiment has its own shortcomings, for the outcome may not be the subjects' instant response. They may produce the answer after a second thought. Therefore I designed online experiment 3 and used DMDX to elicit their instant response and recorded their response time of each testing item.

This on-line experiment with DMDX aimed to analyze another 30 participants' response time of minimal meaning under minimal and enriched contexts, and then their pragmatic processing patterns would be inferred through the difference of response time.

As to target sentence reading time, it shows that mean target sentence reading time in minimal context (1581.8093 ms) is significantly longer than that in enriched context (1330.6345 ms), for T value is $2.260 > T$ critical 2.0 , $p \leq 0.05$. This finding is mainly in line with B&C's research results which supports the prediction of the RP (Rank Parallel Pattern) over either the LFS or the LPP patterns, which claims that minimal and enriched meanings occur at the same time and compete in the sense that the enriched meaning will reach the threshold level for activation before the minimal one. That means there is a stage in pragmatic processing of utterance at which a minimal proposition is recovered.

Based on the RP pattern, enriched interpretation is usually more accessible, so in minimal context people must overcome a more accessible enriched meaning to get the minimal contextual meaning. Thus slows down the target sentence reading time in minimal contexts.

VII. DISCUSSION AND CONCLUSION

My experiments shows that whether an enriched meaning is a part of what is said cannot just resort to people's intuition. So empirical supports are needed. People might have stored

this utterance with various contexts as a whole. Both minimal meanings and enriched meanings are context-bound. Their choices depend on the accessibility of their stored utterance meaning.

The online experiment supports the RP pattern that minimal and enriched meanings occur at the same time and compete in the sense that the enriched meaning will reach the threshold level for activation before the minimal one. That means there is a stage in pragmatic processing of utterance at which a minimal proposition is recovered. Therefore, enriched meanings cannot itself represent what is said without the involvement of minimal ones.

It is of great theoretical significance to test the three rival pragmatic processing models and triangulate the previous experimental results by Chinese data. We assume more than one single explanatory models that can unite all sort of pragmatic processing. We recognize the importance of achieving such models but believe that to examine the mental processing work in each sentence type is the first step towards this achievement.

My research has its own limitations. My experiments are all designed from the hearer's point view. Supposed that if the utterance is spoken out enriched, does hearer recover its minimal meaning in pragmatic processing? So further research can focus on the speaker's side.

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