

Experimental Studies of Free Indirect Discourse

Block I: Psycholinguistics—A Primer

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Overview

Mon Psycholinguistics: A Primer

Tue Free Indirect Discourse: Representations and Processes

Wed Empirical Evidence I—what has been done?

Thu Empirical Evidence II—what else could be done?

Aims I

- Sketch a geography of the issues
- Identify the white spots on the map
- Evaluating the empirical/experimental data available so far
- Delineate further possibilities of experimental investigation
- ...

Aims II

- A note on didactics:
- Throughout the slides, you'll find **questions** marked by “Q:”. These are just the questions that *I* came up with, and which I took to be possibly of some help in checking whether you are still on board. You are invited—indeed, *urged*—to pose your own question at every point something is unclear to you, even if that may imply taking a detour. If you have read *Tristram Shandy*, you know that all the important and fun stuff is in the detours, not in the main plot.

Road Map for today

- What's *Psycho* about Psycholinguistics?
- Psycholinguistic Research Questions
- The Role of Experiments
- “Normality assumptions” in interpretation (and how literary texts violate them)

What's *Psycho* about Psycholinguistics? I

- Psycholinguistics (in my view) is that part of linguistics that tries to find answers to the following three questions:
 - How does language comprehension work?
 - How does language production work?
 - How does language acquisition work?
- To answer these questions, Psycholinguistics draws from two sources:
- Firstly, it takes those parts of theoretical insights from Theoretical Linguistics that it needs to formulate the three questions above properly.

What's *Psycho* about Psycholinguistics? II

- E.g., we need a notion of *comprehension*; that presupposes some notion of *meaning*; that presupposes some notion of *structure*, and of *meaning constituents/lexical items/words*; which in turn presupposes a process of *segmentation* of strings/acoustic events; which presupposes a conception of the perceptual processes involved; etc.etc.
- Second, it borrows (some of) the architectural and procedural assumptions and the empirical apparatus of cognitive psychology, i.e. perception, inference, storage, recall, etc.
- So the *Psycho* in Psycholinguistics has (mostly) to do with *processes*, while the *Linguistics* has (mostly) to do with *representations*.

What's *Psycho* about Psycholinguistics? III

- An example:

(1) *Peter's wife was entering the bank.*

Q: Which ingredients do we need to describe and explain what is going on when a person understands (1)?

What's *Psycho* about Psycholinguistics? IV

- (Linguistic) Levels of representation:
 - (Phonemic/graphemic)
 - Lexical (words)
 - (Morpho-) Syntactic
 - Semantic
 - Pragmatic
 - ...

Q: Can you come up with an example for a problem on each of the levels?

Q: What do you think is the outcome of the process of comprehending (1)? What does the ultimate representation of its meaning look like?

Psycholinguistic Research Questions I

- In what follows, we will mostly look at *language comprehension*; although language production is a fascinating field, in this course we will concentrate on the perspective of the *reader*, not that of the writer.
- (But, as an aside, think of what a manuscript sheet like the one of James Joyce's that Frank presented this morning could eventually tell us about the *production* processes that a writer goes through!)

Psycholinguistic Research Questions II

- We will further assume that the reader is reading English, i.e. a language whose script is using blanks to identify word boundaries, and punctuation to delineate sentences. (This saves us the whole cumbersome issue of segmentation.)
- We're still left with a number of questions that are partly still quite far from being answered in the current state of the field, among them ...
 - ... how exactly word meaning is accessed (the problem of *lexical access*);
 - ... how strings are chunked into constituents, and how are hierarchical structures built up from these (the problem of (syntactic) *parsing*)

Psycholinguistic Research Questions III

- ... how word meanings are combined to yield sentence meanings (the problem of *compositionality*)
- ... what the exact makeup of the ultimate representation of the sentence meaning is (the problem of *conceptual representation*)
- ... how relations between sentences in multi-sentential discourse are established to yield a representation of larger parts of a text (e.g., a paragraph; the problems connected to that can be subsumed under the problem of *discourse representation*).

Psycholinguistic Research Questions IV

- It's important to note that these issues are far from settled even for the simplest, in a sense most normal situation—speaker *S* informing hearer *H* about some state of affairs.
- This brings up the issue of *normality*, to which we will turn shortly. First we have to see how Experimental Psycholinguistics—or, more specifically, language comprehension experiments—try to deal with these research questions.

Why experiments? I

- From its very beginnings in the early 1960s, psycholinguistics was an *empirical* science. That is, just like Physics or Geography, it formulates hypotheses about certain entities in the world and their properties, and certain relations between events in which these entities and their properties are involved.

Q: Would you agree with this statement? If not, *why* not?

Why experiments? II

- What Psycholinguistics is trying to do is to find empirical evidence for the role that certain representations (assumed by linguists or psychologists) play in certain *experimental tasks* involving language.
- Typically, such an experimental task involves some kind of a (linguistic) *stimulus*, to which participants are asked to *react* in a certain fashion (according to some instruction).
- That is, we borrow from Cognitive Psychology the idea that the *response* that participants in an experiment exhibit when confronted with a certain *stimulus* may allow us to infer something about the role that some representation(s) of the stimulus might play in solving the experimental task.

Why experiments? III

- Some simple experimental tasks:
 - free association
 - cloze task
 - memorizing the last word of a list of sentences (“*span task*”)
 - click experiments
 - naming, rhyming (with and without distractors)
 - reading (a word, a sentence, a text)
 - grammaticality judgments
 - truth-value judgments
 - picture verification/sentence-picture matching

Why experiments? IV

- Probably the most fundamental notion in experimental psychology—as in every other empirical science—is that of *measurement*.

Q: Given the tasks above, do you have any idea what is *measured* in these tasks?

- Why are we measuring something? Because we want to compare things to each other (larger/smaller, slower/faster etc.).

Why experiments? V

- Moreover, we want to generalize over certain instances/tokens to their respective types. (We surely do not want to measure for every instance of a 2kg and 3kg stone falling from a 5-storey building whether it's true that the 3 kg stone arrives first—we want to *generalize*.)

Q: What are the types of things which want to generalize over in the case of psycholinguistic experiments?

Why experiments? VI

- We want to generalize over events of the type PERSON \times PROCESSES STIMULUS s UNDER TASK ASSIGNMENT a , or, more specifically, over events of the type IF PERSON \times PROCESSES STIMULUS s UNDER TASK ASSIGNMENT a , THEN WE CAN OBSERVE REACTION v UNDER STIMULUS CONDITION A AND REACTION v' UNDER STIMULUS CONDITION B .
- (We will come later to the talk of “conditions”).
- If we want to generalize over the way in which the participants in a psycholinguistic experiment process certain stimuli, we are confronted with a problem: the *sampling* problem.

Why experiments? VII

- Since we cannot test *all* members of a given population (e.g., the speakers of American English), we will have to sample. But statistics tells us that sampling comes at a cost: there can be a sampling error. The pattern of reactions to a given stimulus we observe in our sample may not reflect the so-called *true score*, i.e. the pattern representative of the whole population. But that's what we want to make a statement about: the behavior of people processing language under such-and-such conditions.
- Thus, we have to *infer* the pattern that holds for the population from the pattern we observe in the sample.

Why experiments? VIII

- To make sure that we draw the *right* inferences from the pattern we observe sample, we must employ statistic procedures that minimize the possibility of making an error in this inference process; these procedures go under the name of *inferential statistics*.
- An important step in the development of contemporary experimental psycholinguistics was the observation (due to Herb Clark, 1974) that in performing experiments, we do not only take a sample from the population of speakers/hearers of a given language, but also from the words/structures of that language.

Why experiments? IX

- That is, not only do we want to generalize over (the behavior of) participants, but also over the effect(s) that a stimulus has on the participants' behavior; we want to generalize about language *types* (word classes, construction types), not only tokens.
- Thus, if we test a certain hypothesis about some particular construction in a given language, we not only have to test a sample of a sufficient number of participants, but also a sample of a sufficient number of *instances* of that construction (items).

Why experiments? X

- Rule of thumb: for each cell in our design, we have to test at least four participants and four items.

Q: What's meant by "design"?

A sample experiment I

- What do we need for an experiment?
 - a hypothesis
 - a design
 - materials
 - participants
 - possibly some technical apparatus
- Hypothesis: a statement (mostly in conditional form) of the predicted outcome (the *dependent variable*) given the *independent variables* (including the *factors*, i.e. the operationalisations of some theoretical concepts (e.g. + vs – FID)).

A sample experiment II

- (Note that the predicted outcome implies a certain statistic procedure to assess the validity of the hypothesis, i.e. a cut-off value for the probability of falsely rejecting the null hypothesis.)

A sample experiment III

- Suppose we want to test Emar's hypothesis that expressives are OK in direct discourse (DD), but not in indirect discourse (ID).

Q: What do we have to do?

A sample experiment IV

- step 1 Formulate a theoretical hypothesis. E.g., “A DD sentence containing an expressive is pragmatically well-formed, whereas an ID sentence with an expressive is not.”

- step 2 Translate the theoretical hypothesis into an empirical one: “People who are instructed to rate the sensibility (or pragmatic wellformedness) of a sentence will give lower ratings to an ID+expressive than to a DD+expressive.

A sample experiment V

step 3 Construct materials, i.e. lexical variants under the two *experimental conditions*, i.e. DD and ID for each sentence, controlling for as many irrelevant variables as possible.

(ID) Mary said that that bastard should be fired, but I like him.

(DD) Mary said: "That bastard should be fired!", but I like him.

Q: How many of these variants do we need?

- (What is and isn't a relevant variable in the materials is (partly) determined by the hypothesis.)

A sample experiment VI

- step 4 Come up with a design—in this case, a latin square design. Each participant should see each variant of a sentence under one condition (DD vs. ID) only once.

- step 5 Create fillers.

- step 6 Construct a questionnaire (with an appropriate instruction!). Randomize the order of presentation of items and fillers in the questionnaire.

- step 7 Invite participants and have them fill out the questionnaire.

- step 8 Digitalise and analyse the results (raw values).

A sample experiment VII

step 9 Do the statistics: compute means and standard deviations and compute a suitable test (in this case, t-Test/ANOVA or LMM).

step 10 Assess the validity of the hypothesis. Done!

Normality I

- In a typical psycholinguistic experiment, people are confronted with linguistic stimuli under highly constrained, and, admittedly, somewhat artificial circumstances (cf. self-paced reading).
- But the usual Gricean principles hold for these situations.
- That is, the presentation of a sentence expressing proposition p is taken to inform the participant that someone (e.g. the experimenter) wants to inform the participant that she thinks that p is true.

Normality II

- That is, the participants task in an experiment testing comprehension usually is to create a representation of p allowing her to perform the task. In most experimental situations, this does not go beyond the usual pragmatics of an everyday dialogue situation: she will build a straightforward semantic representation of p , i.e. the state of affairs that the experimental sentence denotes.
- The problem with testing FID is its *literariness* (cf. Frank's class yesterday morning)—it is, to most people, tied to literary genres.

Normality III

- Literary genres, apart from having the experimentally rather unpleasant property of being multi-propositional, come with a quite peculiar type of pragmatics (cf. ambiguity, “open places”, unreliable narrators, etc.).
- Moreover, FID forces the reader to create a special kind of representation: the comprehension of a sentence containing an FID marker and describing some state of affairs does not result in a semantic representation of that state of affairs, but rather in a “second-order” representation consisting of some *attitude holder* who stands in a certain relation to that state of affairs.

Q: Compare the following two minimal discourses wrt to this property!

Normality IV

(2.a) Peter sat down. The dean sat to his left.

(2.b) Peter sat down. Oh no, the dean sat to his left!

Normality V

More on this tomorrow!

Thanks!