

9.59, 24.905: Psycholinguistics
Problem Set 2

Handed out: March 10, 2005
Due: March 29, 2005

Note: If you hand the problem set in by March 18 (before spring break), we will have it graded for you by Mar 29, before the second test on Mar 31.

Answer all questions. Total number of points: 90. You are encouraged to work in groups, but do the write-up independently.

1. (5 points) Briefly work through the DLT integration costs for each word in the following sentence:

a. Mary kicked the ball which John had kicked to her into the goal.

2. (5 points) According to a DLT-based theory of ambiguity resolution, minimizing structural storage costs is one factor that contributes to ambiguity resolution. Show how this hypothesis would apply in processing (2a), by appeal to details of storage costs:

a. I wonder who Mary saw Bill with at the party.

In particular, consider whether it is preferable to posit a gap as soon as possible (after “saw”) or whether it may be preferable to wait and posit a gap later in the sentence.

3. (5 points) Recall that in Chinese, subject-extracted relative clauses are harder to process than object-extracted relative clauses when they modify a subject NP:

a. Chinese object extraction, modifying the subject NP “official”
[tycoon invite t_i comp] official_i met doctor
‘The official who the tycoon invited met the doctor.’

b. Chinese subject extraction, modifying the subject NP “official”
[t_i invite tycoon comp] official_i met doctor
‘The official who invited the tycoon met the doctor.’

(Note: the Chinese complementizer comes after the RC.)

The dependency locality theory of resource use explains this preference because of the lower storage and integration costs associated with the object-extractions.

What does the DLT predict will be the more complex structure when the RCs modify an NP in object position of a sentence, as in (3c) and (3d)? That is, which structure should be more complex to process? (Hint: consider ambiguity.) Explain your reasoning in detail.

c. Chinese object extraction, modifying the object NP “official”
doctor met [tycoon invite t_i comp] official_i
‘The doctor met the official who the tycoon invited.’

d. Chinese subject extraction, modifying the object NP “official”
doctor met [t_i invite tycoon comp] official_i
‘The doctor met the official who invited the tycoon.’

4. (5 points) What does the information flow account in Gibson, Desmet et al. (2001) predict will be easier to process: a subject pronoun or an object pronoun, as in (b) and (c):

a. Context sentence. John entered the classroom.

b. The TA said hello to him.

c. He said hello to the TA.

Explain your reasoning.

5. (5 points) Provide a Gricean analysis of the following two interactions:

a. Context: Mary is cold. She sees an open window beside John, and she says to John “It’s cold in here” in order to get John to close the window.

b. A mother and father are discussing the behavior of their son, Billy:

Mother: Billy got in trouble at school today.

Father: Well, boys will be boys.

6. (5 points) Describe the predictions of the principle of parsimony (in the referential theory) on the following four sentence structures:

a. VP attachments:

The men painted the doors with new brushes before the festival.

The men painted only doors with new brushes before the festival.

b. NP attachments

The men painted the doors with large cracks before the festival

The men painted only doors with large cracks before the festival

7. (5 points) Murray & Liversedge (1994) examined the processing of the MV/RR ambiguity in referential contexts like the following:

a. Context: One guest vs. two guests in the context

Two people were discussing the food that had been prepared at the barbecue. One was a guest that enjoyed meat and the other was a caterer / guest who was a vegetarian.

b. Target

RR: The guest (who was) grilled the steak said it tasted nice.

They found that there was no significant effect of context in initial reading time measures. That is, the ambiguity effect in the one guest context was not reduced in the two-guest context.

Does this result go against the predictions of the principle of referential support (in the referential theory)? If so, why? If not, why? How can we reconcile this result with the principle of referential support?

8. (5 points) Which of the following sentences is likely to be more complex in a null context? Why?

- a. The comet, which the astronomer discovered with binoculars, was the largest known comet of its kind.
- b. The comet that the astronomer discovered with binoculars was the largest known comet of its kind.

Suppose you placed each of the above sentences in a supportive context, as in (c) and (d):

c. Context for sentence (a):

An astronomer discovered a comet and an asteroid in similar orbits.

d. Context for sentence (b):

An astronomer discovered a comet with binoculars and another with the telephoto lens of his camera.

Now which of sentences (a) and (b) is likely to be more complex, and why?

9. (12 points) Consider the following pair of theories from class:

(a) Form-Based Account

Contrastive inference is closely tied to conventional meaning of restrictively modified NPs or to the lexical class of the modifier. Scalar adjectives contain a variable assigned by a contextually relevant comparison class (Seigel, 1980; Bierwisch, 1987)

(b) Gricean Account

Contrastive inferences arise because the use of a restrictive modifier is embedded in a collaborative communicative context.

Quantity-2: Don't make your contribution more informative than is required for the purposes of the present exchange.

The hearer notes that the speaker chose a modified form rather than an unmodified form to refer to an entity. The inclusion of the modifier is most easily made informative by attributing to it a distinguishing function.

For each of the following displays and corresponding commands:

(i) Describe the patterns of eye-movements that typical experimental participants will make;

(ii) Describe what the Form-based account predicts for the pattern of eye-movements, and why it makes these predictions.

(ii) Describe what the Gricean account predicts for the pattern of eye-movements, and why it makes these predictions.

- I. Display 1: A red pencil, a blue pencil, a red cup and a napkin. Command: "Pick up the red pencil."
- II. Display 2: A big pencil, a small pencil, a big cup and a napkin. Command: "Pick up the big pencil."
- III. Display 3: A plastic mug, a ceramic mug, a plastic key and a napkin. Command: "Pick up the plastic mug."

10. (5 points) Consider the extended Gricean account that was discussed in class, in which people are sensitive to the typical ways in which objects are described in order to make their judgments about whether a modifier is informative of a contrast set or not. What does this theory predict for the pattern of eye-movements of a typical participant whose is told to "pick up the yellow banana" in the context of a yellow banana, a green banana, a yellow cup and a napkin? Give reasons for your answer.

11. (8 points) Pronoun resolution

Consider the following passage:

“There was a debate with the Democratic presidential candidates on TV yesterday. First, Kelly accused Dean of secretly being a Republican, and Gebhardt blamed **him** for Vermont’s lack of tire manufacturing plants. Then, Dean attacked Kelly because **he** had lied about having been to Vietnam.”

What preferences for resolving the pronouns (printed in boldface) do the following accounts predict:

1. Centering Theory
2. Parallel Preference
3. causality-based approach
4. Kehler’s coherence-based approach

How do the different accounts make their predictions? Compare the predictions to your intuitions about how these pronouns should be resolved.

12. (15 points) Labeling coherence relations in a text

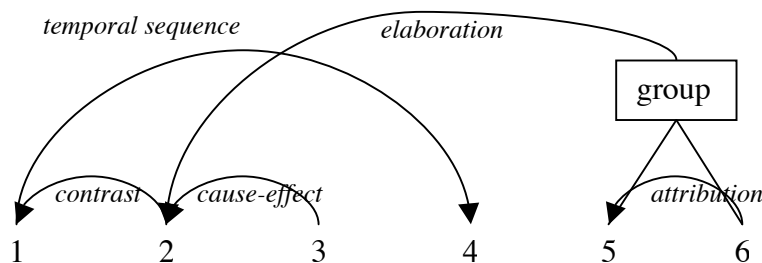
Peruvian Shockingly Knowledgeable About U.S. History

- 1) During her two-week visit to the U.S.,
- 2) Peruvian visitor Alejandra Mañera demonstrated a "frightening" depth of knowledge about U.S. history,
- 3) her American friend Briana Heckel reported Monday.
- 4) "We were sitting around talking about how Bush has no idea how to rebuild Iraq,
- 5) and Alejandra starts mentioning how at least Woodrow Wilson outlined his postwar plan with his '14 Points' speech,"
- 6) Heckel said.
- 7) "Then she starts listing all the points,
- 8) and I'm like,
- 9) who's Woodrow Wilson?"
- 10) Mañera further unnerved Heckel by speaking flawless English.

Please label the text above (from *The Onion*, 10/22/03) with coherence relations (not including the title). Use the numbers of the text fragments to draw a coherence graph with labeled directed arcs (nodes in the graph represent the text fragments, labeled directed arcs represent the coherence relations that hold between the text fragments).

In addition to relations between individual fragments, it is also possible for groups of text fragments to relate to other individual fragments / groups of fragments. For example, in the graph below, there is a group consisting of fragments 5 and 6, and it elaborates on fragment 1.

A coherence graph might look like this:



In addition to the coherence relations that were introduced in class, you might want to consider the following relations:

Attribution – one fragment states the source of what is stated in another fragment, for example:

1. John said that
2. the weather would be nice tomorrow.

(1) and (2) are in an *attribution* relation (direction of the relation: (1) → (2)).

Temporal Sequence – one fragment states an event that takes place before another event stated by another fragment, for example:

1. First, John went grocery shopping.
2. Then he disappeared in a liquor store.

(1) and (2) are in a *temporal sequence* relation (direction of the relation: (1) → (2)).

13. (5 points) Factors in determining a discourse structure

(a) Consider the coherence structure you just determined in the last question. Think about what kinds of information one might use to determine that coherence structure. In particular, please mention one example of each of the following kinds of information and how it could play a role in determining the coherence structure of the text in the last question:

1. lexical chains
2. connectives / words signaling the coherence relation
3. pronominal relations

(b) Please mention one long-distance coherence relation that occurs in the coherence structure you determined in the last question (long-distance = more than one intervening node; in the example graph above, the relation from 1 to 4 as well as the relation from the group of 5 and 6 to 2 are long-distance relations). Please also address the following aspects:

- How did you determine the long-distance relation?
- Did you determine it in a different way compared to short-distance relations?

14. (5 points) What kind of an event-related potential (ERP) waveform would you expect for the comparison between (a) and (b) at the point of processing the verb “visit”? Why?

- a. Which doctor did the man visit on Tuesday?
- b. Which apple did the man visit on Tuesday?

What ERP pattern would you expect if the verb “visit” were replaced by the verb “eat”?