12D Comprehension

1. Comprehension
   1. How do we build up the meaning of the entire sentence or section?
   2. Comprehension is about the integration of word identification, parsing, thematic roles, and individual word meaning.
   3. Constructive process – do we work out a complex mental model or just do the minimal amount of work necessary?
   4. Inferencing – going beyond the literal material
   5. Definitions:
      1. Text – printed/written material
      2. Story – self contained type of text
      3. Discourse – linguistic units composed of several sentences
      4. Conversations – spoken interchanges where the topic may change
   6. Most discourse work is on text instead of conversations – although they can be different
   7. Processing
      1. Semantic processing – working out what words and sentences mean
      2. Referential processing – working out their role in the model
   8. Text processing
      1. Coherent – material needs a topic to be integrated
      2. Referential coherence – consistency in who or what is being talked about
      3. Temporal coherence – consistency in when event occur
      4. Locational coherence – consistency in where events occur
      5. Causal coherence – consistency in why events happen
      6. Cohesive – if same things are referred to in successive sentences
2. Memory for text and inferences
   1. General
      1. Watergate! (<http://www.youtube.com/watch?v=hW1cgf4qwJ4>)
         1. John Dean was not able to remember the events, and half of what he said turned out to be inaccurate.
      2. Similar to eyewitness testimony, our representation of text/speech is highly influenced by attitudes, mood, etc. We tend to represent the “gist” of the information.
         1. Tell me about your favorite book!
         2. If you give participants sentences with different word orders, they quickly forget which sentence they saw, but can remember which sentence was the right one in meaning.
         3. We seem to dump word information at the ends of sentences especially (maybe phrases as well).
      3. We can remember surface detail if it was important and more “real” like conversations, instead of lectures
         1. <http://listverse.com/2007/10/18/top-15-film-misquotes/>
   2. Importance
      1. We remember the parts of the text that we feel are more important and interactive
         1. Example:
            1. I think you’ve made a fundamental error in this study
            2. I think there are two fundamental tasks in this study
         2. Why?
            1. We might spend more time reading the interactive parts (eye tracking)
            2. But if you control for this difference, we still flag it and remember it better
   3. Prior knowledge
      1. Bransford and Johnson balloon story
         1. If the balloons popped, the sound wouldn't be able to carry since everything would be too far away from the correct floor. A closed window would also prevent the sound from carrying, since most buildings tend to be well insulated. Since the whole operation depends on a steady flow of electricity, a break in the middle of the wire would also cause problems. Of course, the fellow could shout, but the human voice is not loud enough to carry that far. An additional problem is that a string could break on the instrument. Then there could be no accompaniment to the message. It is clear that the best situation would involve less distance. Then there would be fewer potential problems. With face to face contact, the least number of things could go wrong.
         2. Gave them context before, after, or none
         3. Context before did the best, after and none were the same
         4. Context must help with comprehension > which leads to better recall of the text
      2. Washing machine study
         1. The procedure is actually quite simple. First you arrange things into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step, otherwise you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important bu complications can easily arise. A mistake can be expensive as well. At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one never can tell, After the procedure is completed one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is part of life.
         2. Background knowledge helps, but only if you understand when it’s applicable.
      3. Anderson and Pichert study
         1. Two boys play hooky from school. They go to the home of one of the boys because his mother is never there on a Thursday. The family is well off. They have a fine old home which is set back from the road and which has attractive grounds. Bust since it is an old house it has some defects: for example, it has a leaky roof, and a damp and musty cellar. Because the family is wealthy, they have a lot of valuable possessions – such as a ten speed bike, color TV, and a rare coin collection.
         2. If the title was “house buying” what do you think people remembered? What about “burglar”?
         3. Perspective is also important > helps you search memory for the right information.
      4. With background knowledge, there are tons of things that you could make connections to – think about book series, would they make any sense if you read the 3rd book in something?
   4. Inferences
      1. Definition – derivation of additional knowledge from facts already known; this might involve going beyond the text to maintain coherence or to elaborate on what was actually presented.
      2. Inferencing is the way you pull in background information, context, etc to make a model of the text (it’s the process – the other parts are the pieces)
         1. Can lead you astray, and you’ll think you remember things you didn’t actually see/read:
            1. Gerald Martin strove to undermine the existing government to satisfy his political ambitions. Many of the people of his country supported his efforts. Current political problems made it relatively easy for Martin to take over. Certain groups remained loyal to the old government and caused Martin trouble. He confronted these groups directly and silenced them. He became a ruthless, uncontrollable dictator. The ultimate effect of his rule was the downfall of his country.
            2. Some people saw Gerald Martin, some saw Adolf Hitler.
            3. What do you think they remembered the paragraph talking about when Hitler was presented?
      3. Types of inferences
         1. Logical inferences – come from the meanings of words
            1. John is a bachelor – we know John is a male.
         2. Bridging inferences/ backwards inferences – relate new information to previous information
            1. You see this most with the use of pronouns. Bob went to the store. He bought milk, eggs, and cheese. Who’s he?
         3. Elaborative inferences – extend what’s in the text with our world knowledge.
            1. These types of inferences are easy to use, but cause the *frame problem* for models of text comprehension.
            2. Of all the information we know, how do we decide which parts are important to elaborate on?
         4. Pragmatic inferences – inferences that are not logical
      4. When are inferences made?
         1. Most likely to be about the main characters and their goals
         2. Actions relating to the plot
         3. Constructionist view – inference on a need to know basis, based on your goals of processing
         4. Minimalist view – make bridging inferences, but keep the elaborative inferences as little as possible (because they are more work)
         5. Research shows:
            1. Probably mostly use elaborative inferencing in our memory for text, so using that paradigm biases us to think that more elaboration is going on than really is.
            2. We must use bridging inferencing on-line or as we are actually processing the text – to maintain coherence.
         6. Open discourse roles – bridging inference to link to previous material
            1. I drove to Memphis yesterday. The car kept overheating. – the car here is an open discourse role – you assume drove involves something like car.
            2. Two stage model to resolve these

Bonding – items are suggest by the lexical context

Resolution – link between filler and verb is tested against context.

* + - * 1. Example:

The teacher was busy writing a letter of complaint to a parent (suggests pen).

The teacher was busy writing an exercise on the blackboard (suggests chalk).

However, she was disturbed by a loud scream at the back of the classroom and the chalk/pen dropped to the floor.

At first, you scan right over chalk pen – later your eyes go back to make sure it all matches.

* + 1. Implications:
       1. Eyewitness testimony – Loftus car crash
          1. (<http://www.youtube.com/watch?v=2xuOtM169K0>)
          2. Did you see a broken headlight?
          3. Did you see *the* broken headlight?
          4. How fast where they going when they hit each other?
          5. How fast where they going when they smashed into each other?

Later added broken glass

1. Reference, co-reference, and ambiguity
   1. General
      1. Reference – what things refer to (dur)
      2. Co-reference – two or more noun phrases with the same reference.
         1. There was a vampire in the kitchen; Boris was scared to death of him. Vampire and him
         2. Often pronouns
      3. Antecedent – the linguistic expression that must be taken into account in order to determine the referent of an anaphor; usually the thing that the pronoun is substituting
      4. Anaphor – a linguistic expression for which the referent can only be determined by taking another linguistic expression into account
      5. Anaphor resolution – backward inference that we can use to maintain coherence
   2. Anaphoric ambiguity
      1. Example: Billy stuck a dagger in the corpse. It was made out of silver. It oozed blood.
         1. There are several anaphors and antecedents…how do we know what’s going on?
      2. Coping strategies
         1. Parallel function – match anaphors to antecedents in the same relevant position
            1. Bob sold Dave his broomstick because he hated it.
            2. Bob sold Dave his broomstick because he needed it.
            3. Who does each “he” refer to?
         2. Gender – depends on language, but using gender to help distinguish (he, she)
         3. Verb type
            1. Bob sold his broomstick to Dave because he (he is bob)
            2. Bob blamed Dave because he (he is dave)
         4. Causality
            1. Daniel apologized to Arnold because he had been behaving badly.
            2. Daniel apologized to Arnold because he didn’t deserve the criticism.
         5. Antecedents that are closer to the referent (in # of words)
         6. Background knowledge and elaborative inferences
            1. Bob sold his piglets to Dave because he had become a vegetarian.
         7. Pronouns - are faster when they are the explicit focus of the sentence (foregrounded)
            1. Bob was driving to Memphis.

Foregrounded – he was tired.

Implicit focus – the car.

* + - * 1. It broke down – would be a hard sentence to process because of the implicit focus.
  1. Given-new contract
     1. Coherence is determined by the order in which new information is given to us.
     2. There’s a contract of the reader/writer to give us information in a way we can assimilate it
     3. Takes less time to understand new information when it contains same ideas presented earlier
     4. Centering theory – each utterance/sentence has a *backward looking center* – links it to previous material and a *forward looking center* that offers links to the next material.

1. Models of text representation and processing
   1. Propositional network models
      1. Nodes – meaning is represented by network of intersections
      2. Cases – roles played by what words refer to in a sentence (table 12.1, 380), but hard to define
      3. Propositions – the smallest unit of knowledge that can stand alone: it has a truth value, it can be true or false
         1. You can map these propositions and their relationships to each other (page 379 picture)
      4. Models
         1. HAM – human associative memory
         2. ACT – adaptive control of thought, later ACT\* with spreading activation
            1. Fan effect – more facts associated with something, the slower you are to retrieve that information
      5. Conceptual dependency theory (Shanck) – decomposes sentences into smaller atomic units
      6. Problems:
         1. Hard to define roles, units, relationships to use
         2. Show how information can be represented, but not how we make inferences
         3. Doesn’t show how we get to gist representation
   2. Story grammars
      1. Similar to the idea that sentences have a structure and grammar, the idea is that stories have a grammar as well
      2. Comprehension is to reconstruct the story grammar: settings, themes, plots, etc.
      3. Phrase structure rules – you can build hierarchical story diagrams like the tree diagrams for sentences
      4. When we recall information, you omit the less important details (things lower on the hierarchy)
      5. Problems:
         1. What are the elements, rules? The number of combinations in sentences is too complex, not as easy as labeling nouns, verbs
         2. Stories are context dependent, so it’s hard to make a consistent grammar
   3. Schema based theories
      1. Schema – means for organizing knowledge
      2. Script – script for procedural information
         1. Create a script for food - Page 383 picture
         2. Scripts are actions that are everyday/repeated
         3. If you ask people to create a script – lots of information is agreed upon and ranked in order of importance (remember categories)
      3. Problems:
         1. Just a way of organizing the text
         2. Doesn’t explain how inferences are made
         3. Only explains representation, not process
   4. Mental Models
      1. Situational model – information is represented propositionally
      2. Explanation
         1. A mental world of what is going on in the text, mental images
         2. We especially do this for spatial relationships.
         3. If I ask you to image a top with a book on top, you could do that – mental model. If I ask you to pick up the book, you’ve already got where it was stored.
      3. Tend to represent: spatial, causal, temporal information about goals, characteristics of people/objects.
      4. Include our background information when building these models
      5. Updating the model
         1. Here and now model – information that is currently relevant to the protagonist is more available and is integrated
         2. Time is important component – when it occurs in the story
            1. Segmentation markers are used to note when a shift is going to occur (two days later)
   5. Kintsch construction integration model
      1. Definition - This model combines network, mental, and schema models
      2. Text
         1. Text base – created from input, the actual words, put in as propositional network
         2. Situational model – words are lost, but information is integrated to form a situation of text
      3. Models are built from text and goals of the reader and background knowledge (goal schema of reader)
      4. Coherence graph – network of connected propositions
         1. Microstructure – the connected propositions, we cycle through these and look for overlap. If there is overlap, we integrate new microstructure, if not we inference
         2. Macrostructure – higher level descriptions and processes
            1. Relevant schemas
            2. Knowledge base
            3. Macrorules – allow us to delete propositions from microstructure, summarize propositions, and construct inferences
            4. Script information
      5. Situational model – information is integrated into a larger structure
         1. Temporality, causality, spatiality are very important
      6. Phases
         1. Construction – word meanings are activated, propositions built, inferences made
         2. Integration – network of related items is made into coherent structure
            1. Uses spreading activation to make sure things are relevant, consistent
      7. Evaluation:
         1. Explains reading times, inferencing, difficult text processing, differences in reading ability, memory for text, background knowledge integration
2. Individual differences
   1. General
      1. Bad readers:
         1. Less inferencing
         2. Less integration of meaning
      2. Working memory span – higher spans will be better at keeping information active for longer, helps you reference and integrate
      3. Expertise – the more you know about a subject, the easier it is to integrate background knowledge, know what’s important, etc.
      4. Good readers:
         1. Suppression – attenuating activation of information that has been brought up, basically blocking out unimportant stuff
   2. How to become a better reader: PQ4R method – works best for fact based materials, especially needed to be studied for exams
      1. Preview – survey the material and determine what it covers.
      2. Questions – make up questions for each section
      3. Read – read the material to answer the questions you made up
      4. Reflect – think of examples and try to relate information to prior knowledge
      5. Recite – after finishing section, go back over what it covered. Try answering your questions you made up earlier.
      6. Review – Go back over the main points. Wait, see if you can still answer your questions

