

Garrett's Model

- Speakers engage in detailed planning before beginning to speak
 - Planning proceeds incrementally, in a cascaded fashion
- 4 Stages**
- Message Level
 - Functional Level
 - Positional Level
 - Articulatory/Phonetic Level (Speech)

Support for Garrett's Model

- Tip of the Tongue Phenomenon
 - Brown & McNeillage (1966)
 - "would appear to be in a mild torment, something like the brink of a sneeze, and if he found the word his relief was considerable."
 - TOT phenomenon indicates validity of distinction between functional & positional levels
- Speech Errors
 - Garrett's theory predicts distinct & independent error types associated w/different levels
- Word Errors occur at functional level
 - *Should* be sensitive to thematic and syntactic properties of words (aspects of the lemmas)
 - *Should not* be sensitive to information specified at the positional level, e.g. phonological form of lexemes

liar dog picture liar

time

- Experiments manipulate timing:
 - picture and word can be presented simultaneously
 - or one can slightly precede the other
- We draw inferences about time-course of processing

Schriefers, Meyer, and Levelt (1990)



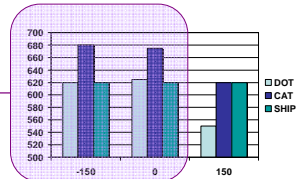
- Auditory presentation of distractors
 - DOT phonologically related
 - CAT semantically related
 - SHIP unrelated word
- SOA (Stimulus onset asynchrony) manipulation
 - -150 ms (word ...150 ms ... picture)
 - 0 ms (i.e., synchronous presentation)
 - +150 ms (picture ...150ms ...word)

Schriefers, Meyer, and Levelt (1990)



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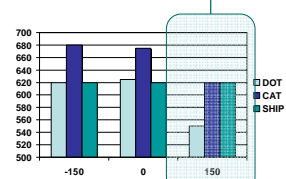
Early Only Semantic effects



Schriefers, Meyer, and Levelt (1990)



- Auditory presentation of distractors
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 - SHIP unrelated word



Late Only Phonological effects

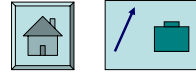
Interpretation

- Early semantic inhibition
- Late phonological facilitation
- Fits with the assumption that semantic processing precedes phonological processing
- **No overlap**
 - suggests two discrete stages in production
 - an interactive account might find semantic and phonological effects at the same time

◆ Speech production is at least in part an incremental process

◆ Planning of complex sentences

◆ Meyer (1996): the arrow is next to the bag



bow suitcase sparrow bad

- ◆ When you hear *bow* (sem.rel.1), uttering 'the arrow is next to the bag' is delayed
- ◆ When you hear *suitcase* (sem.rel.2), uttering 'the arrow is next to the bag' is delayed
- ◆ When you hear *sparrow* (phon.rel.1), uttering 'the arrow is next to the bag' is delayed
- ◆ When you hear *bad* (phon.rel.2), uttering 'the arrow is next to the bag' is not delayed
- ◆ => When starting to speak, not everything is ready, independent modules, can work at the same time!
- ◆ Planning: X (fully) X+1 (partly)
- ◆ Articulating: X

Constituent Structure in Generation

- Speakers generate language in phrases or constituents of phrases (clauses, NPs, VPs)
- Hesitations & Pauses
 - Boomer
 - Mean pause length @ clause boundary = 1 s
 - Mean Pause length w/in clause = .75 s (Boomer)
 - Sentences planned one clause at a time
 - Maclay & Osgood
 - Pauses at phrase boundaries filled by "Um," "Ah"
 - Pauses within a phrase unfilled (Silence)
 - Utterances generated phrase by phrase

Constituent Structure in Generation

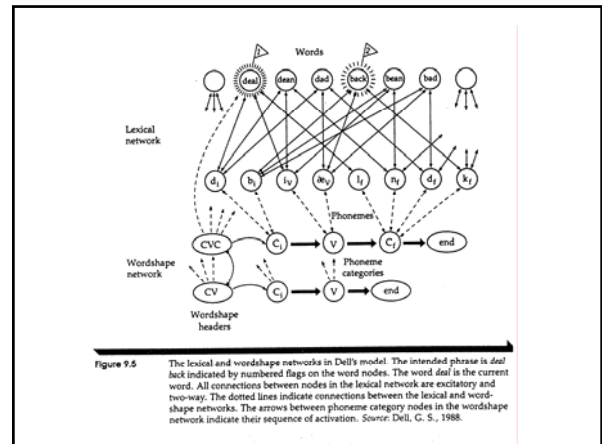
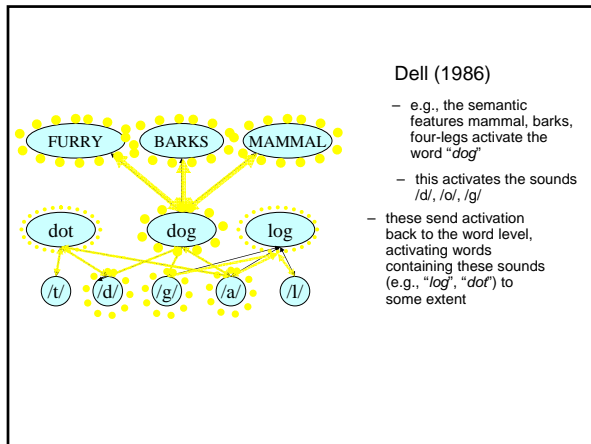
- When speakers repeat or correct themselves, they tend to repeat or correct a whole constituent
- VP | NP | NP
Turn on the heater/ the heater switch.
- Not:**
Turn on the heater/ on the heater switch.
- VP | NP | NP
Turn on the stove/ the heater switch.
- Not:**
Turn on the stove/on the heater switch.

Dell's Model

- Dell
 - Semantic Level
 - Syntactic Level
 - Morphological Level
 - Phonological Level
- Garrett
 - Message Level
 - Functional Level
 - Positional Level
 - Articulatory/Phonetic Level

Dell's Model

- Representations
 - exist at each of the four levels of model
 - processing typically more advanced at higher levels than lower levels
- Categorical Rules
 - set constraints on the categories and combinations of categories that are and are not acceptable
 - rules at each level define categories appropriate to that level
- Lexicon
 - network form w/nodes for words, morphemes, phonemes
- Insertion Rules
 - select the items for inclusion in the representation at each level
 - the most highly activated node belonging to the appropriate category is chosen
 - need verb, choose most active verb
 - once selected, item's activation level immediately reduces to zero



Explaining Speech Errors (Dell)

- Numerous nodes active at same time due to spreading activation
- Speech errors happen when activation spreads to the wrong item, such that it is more active than the target item

Evidence for Dell's model

- Mixed errors
 - Both semantic and phonological relationship to target word
 - Target = "cat"
 - semantic error = "dog"
 - phonological error = "hat"
 - mixed error = "rat"
 - Occur more often than predicted by modular models
 - if you can go wrong at either stage, it would only be by chance that an error would be mixed

Dell's explanation

- The process of making an error
 - The semantic features of dog activate "cat"
 - Some features (e.g., animate, mammalian) activate "rat" as well
 - "cat" then activates the sounds /k/, /æ/, /t/
 - /æ/ and /t/ activate "rat" by feedback
 - This confluence of activation leads to increased tendency for "rat" to be uttered
- Also explains the tendency for phonological errors to be real words
 - Sounds can only feed back to words (non-words not represented) so only words can feedback to sound level

Garrett & Dell on Error Data

- Spoonerisms
 - Garrett reports 93% of spoonerisms within clause
 - Garrett – positional level
 - Dell – phonological level
- Word Exchange Errors
 - I must let the house out of the cat.
 - Garrett – functional level
 - Dell – syntactic level
- Morpheme Exchange Errors
 - He has already trunked two packs.
 - Garrett – positional level
 - Dell – morphological level

Dell vs. Garrett

- Closely Related
- Dell's More Detailed
- Dell's spreading activation neurally plausible and provides links to other cognitive processes

Predictions of Dell's Model

- Errors belong to appropriate syntactic category
 - Also predicted by Garrett
 - Frequently true!
- Anticipation Errors Common
 - The sky is in the sky.
- Anticipation errors turn into Exchange Errors
 - I must write a wife to my letter.
- Anticipation errors involve short distances
- Lexical Bias Effect
 - lewd rip **rude lip**
 - 2 x more common than:
 - luke risk **ruke lisk**
- Speech errors can be multiply determined

Evidence for Dell's Model

- Collections of Speech Errors
 - Mildly problematic...
- Speech Errors in the Laboratory
 - Different sorts of errors associated w/different deadlines (Semantic early/Phonological late)
 - More errors for rare words than frequent
 - Predicts speech errors for low frequency homonyms should be same as their high frequency counterparts

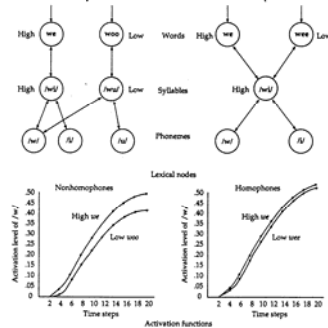
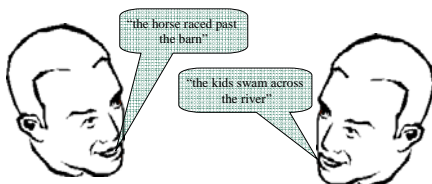


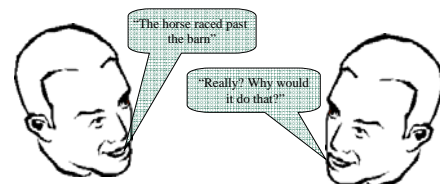
Figure 9.6 Word, syllable, and phoneme nodes for the homophones see and sew, contrasted with the nonhomophones sea and sew. The resting level of activation for the low-frequency word nodes see and sew is assumed to be -1 . A resting level of 0 is assumed for all other nodes. Below are the activation levels of the nodes for see as a function of time and intended word for each network. Source: Dell, G. S., 1988.

Conversational interaction



Conversation is more than just two side-by-side monologues.

Conversational interaction



Conversation is a specialized form of social interaction, with rules and organization.

Conversations



- Herb Clark (1996)
 - Joint action
 - People acting in coordination with one another
 - doing the tango
 - driving a car with a pedestrian crossing the street
 - » The participants don't always do similar things
 - *Autonomous actions*
 - Things that you do by yourself
 - *Participatory actions*
 - Individual acts only done as parts of joint actions

Conversations



- Herb Clark (1996)
 - Speaking and listening
 - Traditionally treated as *autonomous actions*
 - Contributing to the tradition of studying language comprehension and production separately
 - Clark proposed that they should be treated as *participatory actions*

Conversations



- Herb Clark (1996)
 - Speaking and listening
 - Component actions in production and comprehension come in pairs

<p><u>Speaking</u></p> <ul style="list-style-type: none"> – A vocalizes sounds for B – A formalizes utterances for B – A means something for B 	<p><u>Listening</u></p> <ul style="list-style-type: none"> – B attends to A's vocalizations – B identifies A's utterances – B understands A's meaning
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 - The actions of one participant depend on the actions of the other

Conversations



- Herb Clark (1996)
 - Face-to-face conversation - the basic *setting*
 - Features

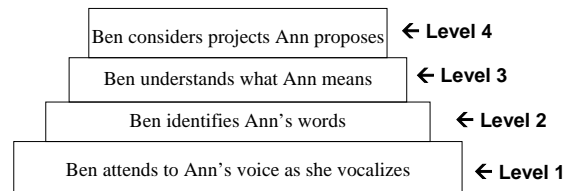
<u>Immediacy</u>	<u>Medium</u>	<u>Control</u>
• Co-presence	• Evanescence	• Extemporaneity
• Visibility	• Recordlessness	• Self-determination
• Audibility	• Simultaneity	• Self-expression
 - Instantaneity
 - Other settings may lack some of these features
 - e.g., telephone conversations take away co-presence and visibility, which may change language use

Herbert Clark

- Disfluencies aren't problems in speaking, but *solutions* to problems
- Disfluencies are signals that speakers plan in order to help coordinate their speaking with their listeners

Language as Joint Activity

- "Like waltzing, playing a duet, or shaking hands, it requires people to coordinate their individual actions in order to succeed (Clark, 1996)."



Signals

Primary Signals

- Linguistic devices that enable Ann to communicate her message
 - Lexical semantics
 - Syntactic Structures
 - Suprasegmental Cues
 - Referential Gestures

Collateral Signals

- Lexical, syntactic, prosodic, and gestural devices that help coordinate primary signals
 - When she will vocalize
 - When she is about to revise or abandon an utterance

Signal the Initiation of Speaking



- In face-to-face conversation, speakers typically wait until they've established mutual gaze to begin
- Use of orienting expressions, e.g. "well"
 - Primary content: opposition
 - Collateral content: signals the initiation of speaking
- Produce pre-utterance filler, e.g. "uh" or "um"
- Produce first word and repeat it

Pursue the Ideal Delivery



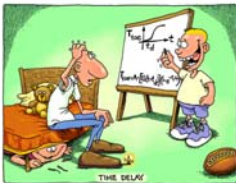
- Speakers try to produce utterances with ideal delivery
 - "the way they would have wanted to produce it if they had no problems (Clark & Clark, 1977)."
 - Characterized by standard prosodic theories
- Logic of Strategy
 - Listeners must attend to what speakers say
 - Processing is easier if expression arrives as expected
 - Speakers should produce utterances (or at least constituents) with predictable prosody

Signal Your Intention to Suspend Speaking



- Since speakers rarely achieve the ideal delivery, they need signals to let listeners know when they will suspend speaking
- Nonreduced vowel
 - [ei] for a
 - [dhi] for the
 - [dhi] followed by suspension 81% LLC
 - Reduced "the" followed by suspension 6% LLC
 - [tuw] for to
- Prolongation, [dhi:]

Signal Your Intention to Delay



- And, if possible, for how long.
- Delay signals
 - Uh signals a brief delay
 - Um signals a longer delay
- Robert: th- there is a (0.2) a uh (0.5) a potential problem,
 - 2nd "a" pronounced "e.yuh" must have been planned as "e.yuh" and not "a" (schwa)
 - Signals suspension of speech

Signal any Expression you Intend to Revise or Abandon

- Speakers have many techniques for signaling items to be revised
- Editing Expressions, e.g. "I mean"
 - Signals clarification/qualification
 - Content of resumption corresponds to the item that's being clarified

Duncan: is there a doctrine about that, -- -- I mean a doctrine about u:h – disfavoring American applicants,
- Prosody
 - Intonation of "they shortlisted" designed to match intonation of "they had"

Kate: they had . . . *They shortlisted* five people. - including me,



Do speakers really do this for the listeners' benefit?

- “An alternative...is that they are not communicative acts, but simply the by-products of problems with planning utterances.”
- Arguments against this:
 - Forms like *uh* and *um* are conventional
 - Planning does not require awareness
 - Selection of *uh* over *um* no different than *the* over *a*
 - Speakers can control their use of disfluencies
 - Good speakers don't do these things in public speeches, but do do them in conversation

Meaning and understanding

- Common ground
 - Knowledge, beliefs and suppositions that the participants believe that they share
 - Members of cultural communities
 - Shared experiences
 - What has taken place already in the conversation
 - Common ground is necessary to coordinate *speaker's meaning* with *listener's understanding*

Structure of a conversation

- Conversations are purposive and unplanned
 - Typically you can't plan exactly what you're going to say because it depends on another participant
 - Conversations look planned only in retrospect
- Conversations have a fairly stable structure



Structure of a conversation

- Joe: (places a phone call)
- Kevin: Miss Pink's office - hello
- Joe: hello, is Miss Pink in
- Kevin: well, she's in, but she's engaged at the moment, who is it?
- Joe: Oh it's Professors Worth's secretary, from Pan-American college
- Kevin: m,
- Joe: Could you give her a message "for me"
- Kevin: "certainly"
- Joe: u'm Professor Worth said that, if Miss Pink runs into difficulties, .. On Monday afternoon, .. With the standing subcommittee, .. Over the item on Miss Panoff, ...
- Kevin: Miss Panoff?
- Joe: Yes, that Professor Worth would be with Mr Miles all afternoon, .. So she only had to go round and collect him if she needed him, ...
- Kevin: ah, ... thank you very much indeed,
- Joe: right
- Kevin: Panoff, right "you" are
- Joe: right
- Kevin: I'll tell her,
- Joe: thank you
- Kevin: bye bye
- Joe: bye



Structure of a conversation

- Action sequences: smaller joint projects to fulfill a goal
 - Adjacency pairs
 - Opening the conversation
 - Kevin: Miss Pink's office - hello
 - Joe: hello, ..
 - Exchanging information about Pink
 - Joe: .. is Miss Pink in
 - Kevin: well, she's in, but she's engaged at the moment...

Structure of a conversation

- Action sequences: smaller joint projects to fulfill a goal
 - Adjacency pairs
 - Exchanging the message from Worth
 - Joe: u'm Professor Worth said that, if Miss Pink runs into difficulties, .. On Monday afternoon, .. With the standing subcommittee, .. Over the item on Miss Panoff, ...
 - Closing the conversation
 - Kevin: I'll tell her,
 - Joe: thank you
 - Kevin: bye bye
 - Joe: bye

Opening conversations

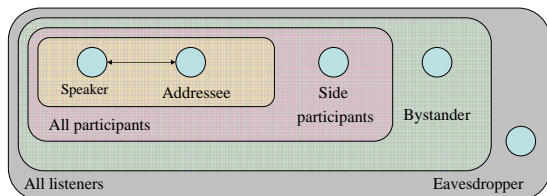
- Need to pick who starts
 - Turn taking is typically not decided upon in advance
 - Potentially a lot of ways to open, but we typically restrict our openings to a few ways
 - Address another
 - Request information
 - Offer information
 - Use a stereotyped expression or topic

Opening conversations

- Has to resolve:
 - The entry time
 - Is now the time to converse?
 - The participants
 - Who is talking to whom?
 - Their roles
 - What is level of participation in the conversation?
 - The official business
 - What is the conversation about?

Identifying participants

- Conversation often takes place in situations that involve various types of participants and non-participants



Taking turns

- Typically conversations don't involve two (or more) people talking at the same time
 - Individual styles of turn-taking vary widely
 - Length of a turn is a fairly stable characteristic within a given individual's conversational interactions
 - Standard signals indicate a change in turn: a head nod, a glance, a questioning tone

Taking turns

- Typically conversations don't involve two (or more) people talking at the same time
 - Three implicit rules (Sacks et al, 1974)
 - Rule 1: Current speakers selects next speaker
 - Rule 2: Self-selection: if rule 1 isn't used, then next speaker can select themselves
 - Rule 3: current speaker may continue (or not)
 - These principles are ordered in terms of priority
 - The first is the most important, and the last is the least important
 - Just try violating them in an actual conversation (but debrief later!)

Taking turns

- Typically conversations don't involve two (or more) people talking at the same time
 - Use of non-verbal cues
 - Drop of pitch
 - Drawl on final syllable
 - Termination of hand signals
 - Drop in loudness
 - Completion of a grammatical clause
 - Use of stereotyped phrase
 - "you know"

Negotiating topics

- Keep the discourse relevant to the topic (remember Grice's maxims)
 - Coherence again
 - Earlier we looked at coherence within a speaker, now we consider it across multiple speakers
 - Must use statements to signal topic shifts

Closing conversations

- Closing statements
 - Must exit from the last topic, mutually agree to close the conversation, and coordinate the disengagement
 - signal the end of conversation (or topic)
 - “okay”
 - Justifying why conversation should end
 - “I gotta go”
 - Reference to potential future conversation
 - “later dude”

Summary

- “People use language for doing things with each other, and their use of language is itself a joint action.” Clark (1996, pg387)
 - Conversation is structured
 - But, that structure depends on more than one individual
 - Models of language use (production and comprehension) need to be developed within this perspective