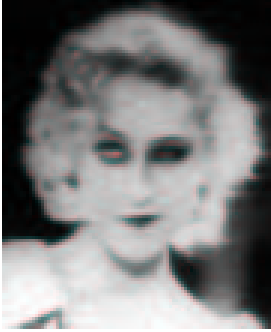


Dialogs

What is a connection between the picture and our topic?



What Makes Dialogue Different?

- Turn taking
- Grounding
- Conversational Implicature

Studies of Dialogs

Regina Barzilay
regina@csail.mit.edu

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Today

- Properties of human dialogs
- Formalization of these properties required for system building
 - Taxonomies of Speech Acts

Turn Taking

People can quickly figure out who should talk next, and when they should speak

- Little overlap (Levinson'1983 smaller than 5%)
- The amount of time between two turns is low (less than few hundred milliseconds)

Transition-taking Rules

Mechanisms for the next speaker selection:

- adjacency pairs (Schegloff, 1968):
GREETING → GREETING
COMPLIMENT → DOWNPLAYER
REQUEST → GRANT
- utterance boundaries

Dialogue Example

C1: I need to travel in May.
A1: And, what day in May you want to travel?
C2: OK uh I need to be there from the 12th to the 15th
A2: And you're flying into what city?
C3: Seattle
A3: And what time would you like to leave Pittsburgh?
C4: Uh hmm I don't think there's many options for non-stop
A4: Right. There's three non-stops today.
C5: What are they?

Transition-taking Rules

Conversation Analysis (1974)

- If during this turn the current speaker has selected A as the next speaker then A must speak next
- If the current speaker does not select the next speaker, any other speaker may take the next turn
- If no one else takes a turn, the current speaker may take the next turn

Utterance Segmentation

- Cue words (*well, and, so*)
- N-grams and POS sequences
- Prosody (pitch, accent, pause duration)

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Continuers

Devices the hearer uses to indicate that she believes she understands what the speaker means (Clark&Schaefer, 1989)

- **Continued attention:** B shows she is continuing to attend and therefore remains satisfied with A's presentation
- **Relevant next contribution:** B starts in on the next relevant contribution
- **Acknowledgment:** B nods or says a continuer like *uh-huh, yeah*, or an **assessment** like *that's great*

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Transition-taking Rules

Silence Duration

A: Is there something bothering you or not?
(1.0)
A: Yes or no?
(1.5)
A: Eh?
B: No.

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Grounding

The speaker and the hearer must establish common ground (Stalnaker, 1978)

A: . . . returning on U.S. flight one one eight
B: Mm hmm

Mm is a back-channel

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Conversational Implicature

A1: And, what day in May did you want to travel?

C2: OK uh I need to be there for a meeting that's from the 12th to the 15th

A4: . . . There's three non-stops today.

Grice Maxims

- **Maxim of Quantity:** Be exactly as informative as required
 - Make your contribution as informative as required (for the current purposes of exchange)
 - Do not make your contribution more informative than is required
- **Maxim of Quality:** Try to make your contribution one that is true:
 - Do not say what you believe to be false
 - Do not say that for which you lack adequate evidence

Continuers

- **Demonstration:** B demonstrates all or part of what she has understood A to mean, for example by paraphrasing or **reformulating** A's utterance, or by **collaboratively completing** A's utterance

A: OK I'll take the 5ish flight on the night before on the 11th

B: On the 11th?

- **Display:** B displays verbatim all or part of A's presentation

Grounding is expressed in different modalities
Note the impact of modality (face2face vs phone conversation)

Conversational Implicature

- The interpretation of an utterance relies on more than just the literal meaning of the sentence
- The speaker seems to expect the hearer to draw certain inferences

Dialogue Acts

- Austin (1962): Utterance in a dialogue is a kind of **action** performed by the speaker
- Types of acts:
 - **locutionary act**: the utterance of a sentence with a particular meaning
 - **illocutionary act**: the act of asking, promising, etc., in uttering a sentence (*you can't do that!*)
 - **perlocutionary act**: the (often intentional) production of certain effects upon the feelings, thoughts, or actions of the addressee in uttering a sentence

Searle's Taxonomy

- **Expressives**: expressing the psychological state of the speaker about a state of affairs (*thinking, apologizing, welcoming, deploring*)
- **Declarations**: bringing about a different state of the world via the utterance (*I resign, You're fired*)

Grice Maxims

- **Maxim of Relevance**: Be relevant
- **Maxim of Quality**: Be perspicuous
 - Avoid obscurity of expression
 - Avoid ambiguity
 - Be brief (avoid unnecessary prolixity)
 - Be orderly

Searle's Taxonomy

Searle (1975): Refined taxonomy of (illocutionary) speech acts

- **Assertive**: committing the speaker to somethings being the case (*suggesting, swearing, boasting, concluding*)
- **Directives**: attempts by the speaker to get the addressee to do something (*asking, ordering, requesting, inviting, begging*)
- **Commissives**: committing the speaker to some future course of actions (*promising, planning, vowing, betting, opposing*)

Forward-looking Functions

- STATEMENT: a claim made by a speaker
- INFO-REQUEST: a question by the speaker
- CHECK: question for confirming information
- OPENING: greeting

Dialogue Act Markup

DAMSL (Dialogue Act Markup in Several Layers)
(Allen&Core'1997; Walker et al'1996; Carletta'1997)

- Driven by the needs of dialog system developers
- Contains several levels, including **forward looking function** and **backward Looking function**
- Hierarchical in structure
- Domain-independent, but tailored towards task-oriented dialogs

Backward-looking Functions

- ACCEPT: a claim made by a speaker
- ANSWER: answering a question
- UNDERSTANDING: whether speaker understands