Lecture 7

Dialogue Genres and Dialogue Act Taxonomies
Dialogue Diversity

• LDC
• Allwood: The Swedish Spoken Language Corpus at Goteborg: multiple activities
  – http://www.ling.gu.se/projekt/tal/
• Mann: Dialogue diversity corpus
  http://www-rcf.usc.edu/~billmann/diversity/DDivers-site.htm
Types of Dialogue

• Task-oriented:
  – dialogue about a task performance

• Information-oriented:
  – one participant needs information that others have

• Relationship-oriented:
  – purpose is influence the nature of the relationship
    (become closer, establish trust, expertise or dominance)

• Individual-oriented:
  – (someone “wants to talk”, express self, listener effects not important)
Nature of Participants

• How many? (2 or more?)

• Participant culture/conventions/ability
  – Computer Agents vs people
  – Language and dialect/register competence

• Participant relationships
  – How well do they know each other
  – On a permanent team?
  – Social relationships (e.g., rank, dominance)
  – Knowledge and ability relationships
Modality of dialogue

- Natural (voice + gesture/body movements, gaze)
- Augmented (drawing, writing, etc)
- Mediated
  - menu
  - Text
  - Graphic
  - gesture
  - voice
  - video
  - Multi-modal
Activity conventions

• Initiative limitations
  – Who can ask questions, make suggestions

• turn-taking limitations
  – Who can speak
  – Who can allocate turn
  – How long can turn be

• Modality limitations
  – Media resources used
  – Language used
Task Oriented Dialogue: Nature of Task

• Complexity
  – Subtasks
  – Choices
  – Duration

• Objects

• Individual or joint action

• Probability of success

• Type of performance
  – Verbal or communicative
  – Observable
  – Attention-demanding
Participants Relationship to Task

• Types of Relationship
  – performance
  – ability
  – know-how
  – desire
  – responsibility
  – authority

• How many participants?
  – all
  – some
  – none
When is task discussed?

• Before task (planning dialogues, e.g., TRAINS)
• During (task management, Circuit Fixit)
• After (diagnosis)
Reason for task

- Achieve goals
  - Do it successfully and efficiently
- Obligation
  - Commit minimal resources needed
- Training
  - Gain familiarity & competence, discover and overcome (potential) pitfalls
- Tutoring
  - Abstract and learn principles
- Fun
  - Maximize enjoyment

⇒ Joint or individual reasons
Speech Acts for Dialogue Agents

• Overview/introduction to speech acts
• Early Speech Act Taxonomies:
  – Austin: verdictives, exercitives, commissives, expositives, and behavitives
  – Searle: representatives, directives, commissives, expressives, declarations
• Multi-level dialogue act taxonomies
Carletta et al

- HCRC coding scheme
  - Moves
  - Games
  - Transactions

- Kinds of reliability (Krippendorff)
  - Stability (test-rest)
  - Reproducibility (intercoder-reliability)
  - Accuracy (coding against gold standard)
HCRC Move Decision Tree

Is the utterance an initiation, response, or preparation?

INITIATION
Is the utterance a command, statement, or question?

COMMAND
INSTRUCT
STATION
EXPLAIN

RESPONSE
Does the response contribute task-domain information, or does it only show evidence that communication has been successful?

PREPARATION
READY

QUESTION
Is the person who is transferring information asking a question in an attempt to get evidence that the transfer was successful, so they can move on?

COMMUNICATION
ACKNOWLEDGEMENT

INFORMATION
Does the response contain just the information requested, or is it amplified?

AMPLIFIED
CLARIFY

INFO REQUESTED
Does the response mean yes, no, or something more complex?

YES
NO
ALIGN

YES
NO
CHECK

COMPLEX

YES
NO
YES
NO
COMPLEX

QUERY-IN
QUERY-W

Figure 1
Conversational move categories.
Core and Allen

- DRI/Damsl coding scheme
  - Designed by committee
  - for broad coverage of task-oriented dialogue
  - Multi-dimensional coding scheme: multiple tags per utterance
Damsl Codes

FORWARD

- Statement
  - Assert
  - Reassert
  - Other-Statement
- Influencing Addressee Future Action
  - Open-option
  - Directive
    - Info-Request
    - Action-Directive
- Committing Speaker Future Action
  - Offer
  - Commit
- Performative
- Other Forward Function

BACKWARD

- Agreement
  - Accept
  - Accept-Part
  - Maybe
  - Reject-Part
  - Reject
  - Hold
- Understanding
  - Signal-Non-Understanding
  - Signal-Understanding
    - Acknowledge
    - Repeat-Rephrase
    - Completion
  - Correct-Misspeaking
- Answer
- Information-Relation

OTHER

- Information Level
  - Task
  - Task Management
  - Communication Management
  - Other
- Communicative Status
  - Abandoned
  - Uninterpretable
- Syntactic Features
  - Conventional Form
  - Exclamatory Form
Di Eugenio et al

• Furniture buying task
• Extensions to DRI/Damsl
  – More tests in decision tree
  – Specific vs general action
  – Collaborative acts (directive+offer)
    • proposal
Dialogue Act Taxonomy considerations

• How detailed?
  – difference in conditions/effects vs. confidence in label
  – capture generalizations or distinctions?
    • example: state, assert, inform, confess, concede, maintain, affirm, claim,...

• Where should complexity reside?
  – Multi-functional, complex acts?
    • Possibly many acts
    • Possibly performances that can not be labelled
    • Ex: verbmobil 1
  – Many (simple) acts per performance
    • Possibly many tagging decisions
    • Ex: Damsl/DRI
corpus annotation comparisons

- **Activities**
  - Trains movement planning (Trains)
  - disaster relief planning (Monroe)
  - Casual conversation (Switchboard)
  - Maptask
  - Scheduling appointments (Verbmobil)

- **Participants**
  - Language (English vs German)
  - Organizational status (students (HCRC) vs military (DCIEM))

- **Dialogue act taxonomies**
  - HCRC
  - Verbmobil (I & II)
  - Damsl
  - SWBD-Damsl
## Distribution of dialogue acts in corpora

<table>
<thead>
<tr>
<th>Damsl TRAINS</th>
<th>Damsl Monroe</th>
<th>SWBD-Damsl Switchboard</th>
<th>HCRC HCRC Maptask</th>
<th>HCRC DCIEM Maptask</th>
<th>Verbmobil II English</th>
<th>Verbmobil II German</th>
<th>Verbmobil I German</th>
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<tbody>
<tr>
<td>statement</td>
<td>45.9</td>
<td>51.4</td>
<td>49</td>
<td>explain 7.9</td>
<td>7.9</td>
<td>Inform,... 22.8</td>
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<td>questions 4.9</td>
<td>query, check, align 23.5</td>
<td>20.3</td>
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<td>12.9</td>
<td>0.7</td>
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<td>commit,offer</td>
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<td>0.6</td>
<td>1.4</td>
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<td>20</td>
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<td>answer</td>
<td>14.7</td>
<td>8.4</td>
<td>3</td>
<td>accept, confirm 10.3</td>
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<td>15.6</td>
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<td>0.3</td>
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<td>3.6</td>
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Taxonomy principles:

• Activity-specific
  – Must cover activity features
  – Make crucial distinctions
  – Avoid irrelevant distinctions (reduce perplexity)

• General
  – Aim to cover all activities
  – Specific activities work in a sub-space
  – Activity-specific clusters as “macros”