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 (Kripendorff)
  - Stability (test-rest)
  - Reproducibility (intercoder-reliability)
  - Accuracy (coding against gold standard)

HCRC Move Decision Tree

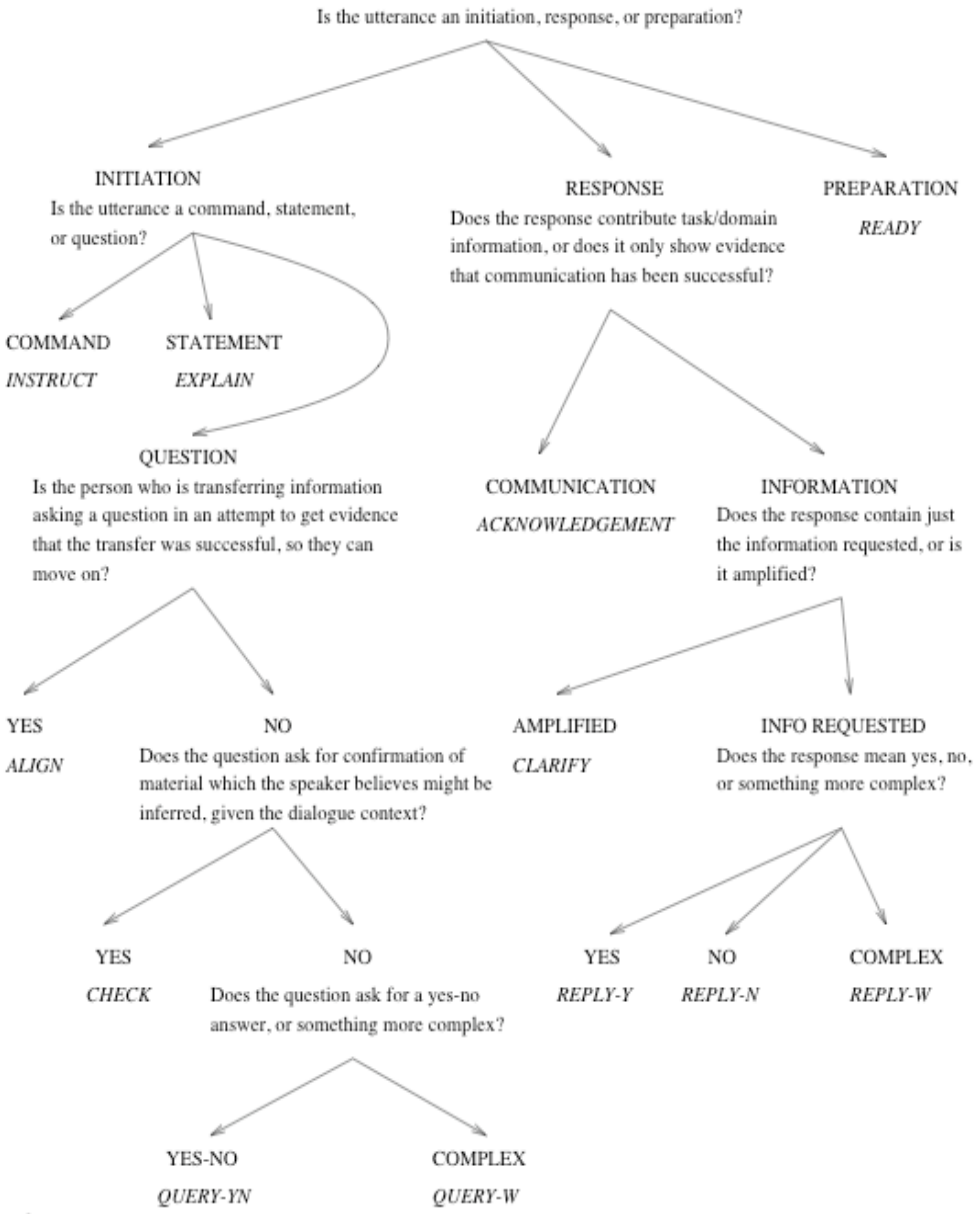

Figure 1
Conversational move categories.

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

Damsl TRAINS	Damsl Monroe	SWBD-Damsl Switchboard	HCRC HCRC Maptask	HCRC DCIEM Maptask	Verbmobil II Verbmobil English	Verbmobil II Verbmobil German	Verbmobil I Verbmobil I German
statement			explain		Inform,...		
45.9	51.4	49	7.9	7.9	22.8	21.2	12.2
info-request		questions	query,check,align				
15.2	9.9	4.9	23.5	20.3			
action-dir,oo			instruct		request,suggest		
12.2	12.9	0.7	15.6	15.2	26.0	27.0	32
commit,offer					commit		
23.8	16.8	0.1			0.5	0.8	
conventional							
2.5	0.6	1.4			13.4	15.6	16.5
answer			reply,clarify		feedback		
14.7	8.4	3	22.8	20	15.2	9.8	0.6
accept					accept,confirm		
30.0	23.0	5			10.3	12.3	13.5
reject					reject,explained		
2.2	0.5	0.2			3.3	4.4	8.2
other agree					clarify		
3.6	1.8	0.3			2.3	1.9	8.9
Understanding			acknowledge		backchannel		
30.2	28.5	23	20.5	28.1	3.6	3.3	
non-understand							
1.2	0.5	0.1					

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”