Introducing Dialogue Games

Lecture 5

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ESSLLI 2007 Dublin 13 – 17 August

Overview Thursday & Today

Thursday: Descriptive dialogue games

- Task-oriented dialogue game for two virtual robots (Power, 1979)
- Generic dialogue game (Ginzburg, to appear)

Today: Dialogue game rules

- Ginzburg (to appear) continued
- Methodological Issues
- Critique (Grice)
- Summary/Conclusion
- Questions – The End

Ginzburg continued …

Recap: Info. States and Conv. Rules

- A notion of an **information state**. Let S be the set of all possible information states.
- A notion of a **conversational rule** *r* that maps $X \subseteq S \Rightarrow Y \subseteq S$. (Preconditions to Effects)
- The ordered pair of information states <x,y> is a pairwise-r-coherent, iff $x \in X$ and $y \in Y$.
- IS-R-coherent($<x_1,\ldots,x_n>$) iff for each pair $<x_i,x_{i+1}>$ (with $0<i<n+1$) $\exists r \in Y$ such that the pair is pairwise-r-coherent.

Warning: notation and formulation of principles is different (though hopefully equivalent in spirit) to that of Ginzburg Chapter 4

Recap: Moves

- For each information state $s \in S$:

  $\exists M$: s.Moves = M.
- If M is non-empty, we also have an m such that s.LatestMove = m
- Non-empty sequence M is R-coherent iff $\exists s_1,\ldots,s_n$ (n>1) such that s_1.Moves = empty & s_n.Moves = M & IS-R-coherent(<$s_1,\ldots,s_n$>).

Recap: Two kinds of rules

- Update rules:

  $A \Rightarrow A'$ if

  $(\text{Moves} = M) \in A$ and $(\text{Moves} = M) \in A'$

- Generation/reaction rules:

  $A \Rightarrow A'$ if

  $(\text{Moves} = M) \in A$ and $(\text{Moves} = M+m) \in A'$

Note that this distinction is not made in Ginzburg Chapter 4 (but see Piwek 1998)

Recap: Information states

- *Dialogue Gameboards (DGB)*
- **Facts**: set of commonly agreed upon facts (Ginzburg argues that each interlocutor maintains their own repr. of FACTS). Closed under conjunction/disjunction.
- **QUD** ('questions under discussion'): partially ordered set that specifies the currently discussed questions
- **MAX-QUD**: discourse topic
- **Moves**: content of the moves made
- **LatestMove**

Assumption: MOVES contains propositions characterizing the linguistic sign (illocution?) of utterances

Rules (Chapter 4)

- Greeting
- Parting
- Disengaged
- Free Speech
- QSpec
- Ask QUD incrementation
- Assert QUD incrementation
- Assertion checking
- Accept move
- Confirm move
- Fact update/QUD downdate
- Question Introduction Appropriateness Condition (QIAC)
- QCoord
- Initiating Move (relative to Private)

Greeting

- A: Hi B: Hi ...
- A: Hi Mo. How are you? B: Ok. Where are you heading. (Countergreeting is not obligatory)

- Greeting: {Moves = empty, …} ⇒
  {Moves = <Greet(spkr,addr)>,…}
- Countergreeting (optional):
  {Moves = <Greet(spkr,addr)>,…} ⇒
  {Moves =<CounterGreet(addr,spkr),
  Greet(spkr,addr)>,…}

"…" indicate further conditions (e.g., QUD and FACTS do not change)

Parting

{QUD = empty, MinInteraction(f), f$\in$FACTs,…}
$\Rightarrow$
{Moves =<Part(spkr,addr),…>,…}

A: Hi B: I'm off A:Ok B: Bye

A: Hi B: #Bye

Minimal interaction: bare reference to each CP's personal situation (Resolved: λP.P(A) & λP.P(B))

Free speech & Ask QUD Incr.

{QUD = empty,…} ⇒
{R:IllocRel,a:AbSemObj,
LatestMove =R(spkr,addr,a),
…}
Complication: re-application?
{q:question,
LatestMove = Ask(spkr,addr,q),
QUD = qud,…} ⇒
{QUD = q + qud,…}
Complication: re-application?

QSpec

{q:question,
QUD = <q,…>,
Moves = M} $\Rightarrow$
{Moves = <R(spkr,addr,r) + M,
Qspecific(R(spkr,addr,r),q),
…}

An utterance u is specific to a question q iff content (u) is either a prop p: About (p,q) or a question q' such that Influence(q',q)

QSpec

Influence

- A: Shall we go to the movies?
- B: What movie is on?
- …

Assertion

- Assertion introduces the issue whether p.

- Justification. Wide range of elliptical proposition modifiers which follow both query and assertion of p:

  A: Bo is in town. B: Yes/No/Perhaps/Definitely.

  A: Is Bo in town? B: Yes/No/Perhaps/Definitely.

Assertion

- But now the effects of polar questions and assertions are identical with respect to QUD:

  A: Bo is in town. B: How do you know?

  A: Is Bo in town? B: # How do you know?

Multiple move turns

- Vicki: When is, when is Easter? March April?

Multiple move turns

- Who will Max be inviting? When will these guests be arriving?

- QCoord

  {LatestMove = Ask(spkr,addr,q), qud = <q,Q>,…} $\Rightarrow$

  {LatestMove = Ask(spkr,addr,q1),

  qud = <q,q1,Q>, *note the ordering*

  not Influence(q,q1),…} *Open end: non-influence*

QIAC

- **Question Introduction Appropriateness Condition**: do not introduce a question if it is already *resolved* by a fact t in FACTS.
- **Resolve** is relative a **goals** and **inferential capabilities:**
- A: Who can we invite?

  B: Some guys from the department.

  A1: I need you to be more specific, who exactly?

  A2: Right, so whoever I'll bump into in the corridor tomorrow afternoon.

FACTS update/QUD Downdate

- {LatestMove = accept(p) or confirm(p),
  qud = <p?,Q>} $\Rightarrow$
  {FACTS = FACTS $\cup$ p,
  qud = nonResolve(Q),…}

  nonResolve is a function that maps qud to qud' consists of the question in q that haven't been resolved yet (relative to FACTS $\cup$ p).

FACTS update/QUD Downdate

Example of "implicit accept"

- A: Several people showed up. (p1)
  Bill did. (p2)
  B: Aha.
  A: Max did. (p3)
  B: I see.

Initiating moves

- Beyond Free Speech
- Issue can be introduced if it relates to the current activity
- This depends on the genre (buying a ticket, small talk, …)
- Genres can be classified in terms of the type of their final state which consists of:
  - FACTS
  - QUD
  - **QNUD**
  - MOVES

Initiating Moves

- You can choose *m*, acting in accordance with genre *G* given what has happened so far, provided that *m* can be anticipated to conclude in a final state *g* such that $g \in G$.

Methodological issues
(*cf*. Levinson 1983: 288-294)

Assumptions:

1. Conversations can be segmented into basic units, i.e., moves;
2. There is a procedure for mapping these units to types from a finite set of (illocutionary) types;
3. Well-formed conversations are characterized in terms of rules governing the sequencing of such moves (taking into account their context change potential).

Methodological issues

- **Problem 1**: segmentation − what counts as a unit? Compare *A: Who will Max invite? When will these guests be coming?* with *A: Who will Max invite and when will they come?*
- **Problem 2**: Multiple moves at once: *Would you like another glass?* (question and offer).
- **Problem 3a**: Reliability of well-formedness intuitions.

A: I have a fourteen year old son.

B: Well that’s all right.

A: I also have a dog.

B: Oh I’m sorry

Methodological issues

- **Problem 1**: segmentation, what counts as a unit? Compare *A: Who will Max invite? When will these guests be coming?* with *A: Who will Max invite and when will they come?*
- **Problem 2**: Multiple moves at once: Would you like another glass? (question and offer).
- **Problem 3a**: Reliability of well-formed intuitions

  We need not only information on the sequence of moves, but also the initial FACTS. It is not clear that these can be determined unambiguously.

Methodological issues

Problem 3b:

Our theory predicts whether certain sequence are well-formed or not.

But, the theory only concerns the moves that are obtained after segmentation and assigning move types.

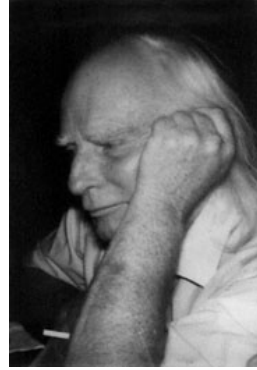
We don’t have full account of how to do this.

Ergo, the theory is not falsifiable.

Critique of dialogue rules

- A dialogue rule relates one set of information states to another set.
- A conversation is coherent *iff* the transitions between the information states that "underlie" the dialogue are in accordance with the conversational rules.
- Speaker perspective: in information state *s,* always apply a generation rule whose preconditions are satisfied by *s*.

Herbert Paul Grice (1913 - 1988)



- Studied and taught in Oxford until 1967.
- Belonged to the group of ordinary language philosophers which was lead by J.L. Austin (1911 - 1960).

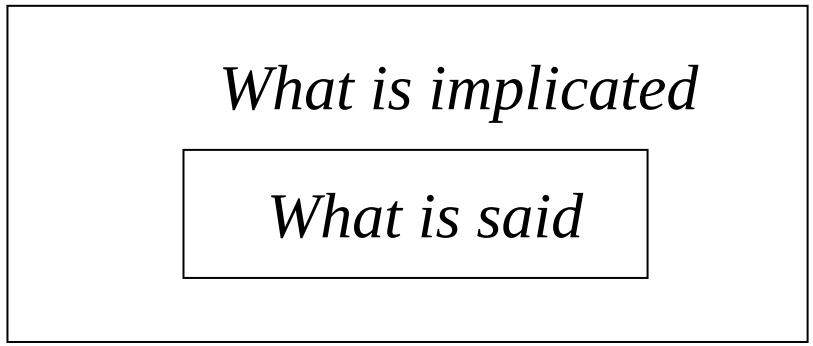
- 1967 – 1979: Professor of Philosophy at Berkeley, California (continued to teach until 1987).
- Some Important Contributions:
  - 1967 William James Lectures at Harvard University entitled Logic and Conversation (introducing the notion of conversational implicature).
  - Meaning (1957): The distinction between natural and non-natural meaning and the definition of the latter.

Logic and Conversation

- Published in full in 1989 in Studies in the Way of Words, Harvard University Press.

- It consists of 7 sections, section 2 also bearing the title Logic and Conversation. Section 2 was previously published in 1975 and 1978.

How does meaning emerge in conversation?



Literal Meaning & Implicature

- **A**: How is C getting on in his job?
  B: Oh quite well, I think; he likes his colleagues and he hasn't been to prison yet.
- >> C is the sort of person likely to yield to temptation from his occupation

  >> C's colleagues are very unpleasant etc.

Conversational Implicature

Based on a principle which governs conversation:

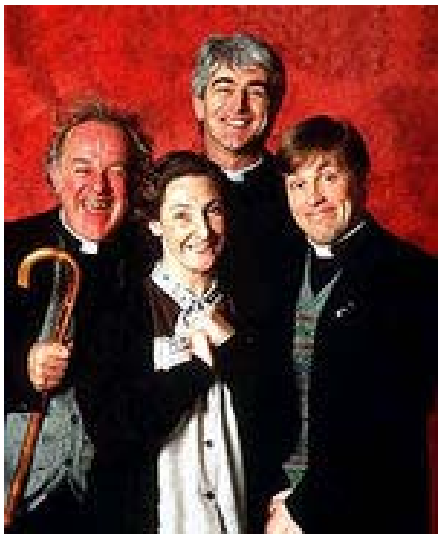
The cooperative Principle: Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged.

Father Ted − "The old grey whistle theft"

BENSON: Anyway father, come on. Have you heard anything?

TED: About what?

BENSON: About my whistle. […] I've had that whistle for fifty years. It saved my grandfather's life.



Father Ted – "The old grey whistle theft"

TED: Did it really?

BENSON: Yes. He was being executed by the British. They had him up against the wall and they shot him. And the bullets all hit the whistle in his coat pocket and bounced off him.

TED: Really? The bullets bounced off him.

Father Ted − "The old grey whistle theft"

BENSON: Yes.

TED: God almighty! So he survived?

Father Ted − "The old grey whistle theft"

BENSON: Yes.

TED: God almighty! So he survived?

BENSON: No, no. They just reloaded and shot him again.

Maxims and their categories

Quantity

- Make your contribution as informative as is required (for the current purpose of the exchange)
- Do not make your contribution more informative than is required

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

Moore's Paradox: It is raining, but I do not believe that it is raining.

Maxims and their categories

Relation

- Be relevant

Manner

- Avoid Obscurity of expression
- Avoid Ambiguity
- Be brief (avoid unnecessary prolixity)
- Be orderly

Conversation as Rational Action

- **Quantity**. Example A helps B to mend a car. If B needs 4 screws, A is expected to hand 4, not 2, or 6.
- **Quality**. If A asks for salt, A does not expect B to hand A the sugar.
- **Relation**. If B needs a screw, B does not expect that A will hand B a hammer, remote control,…
- **Manner**. Expect that from the way you carry out your action it is clear what contribution you are making.

Motivation

- Why do we obey the cooperative principle and its subservient maxims?

- Grice's "answer": if one is interested in communicating/conversation (giving and receiving information from others and influencing their behaviour and being influenced), then one has interest in people behaving according to the principle and its maxims.

Conversational Implicatures

How can participants behave in the light of the maxims?

- Quietly violate them. One is liable to the accusation of being misleading.
- Opt out explicitly. “I cannot say more. My lips are sealed.”
- Faced by a clash (e.g., between quantity and quality).
- **Flout** a maxim. The maxim is being **exploited**.

Conversational Implicatures

- A man who, by (in, when) saying (or making as if to say) that p has implicated q, may be said to have conversationally implicated that q, provided that

  (1) he is to be presumed to be observing the conversational maxims, or at least the Cooperative Principle;

  (2) the supposition that he is aware that, or thinks that, q is required in order to make his saying or making as if to say p (doing so in those terms) consistent with this presumption; and

  (3) the speaker thinks (and would expect the hearer to think that the speaker thinks) that it is within the competence of the hearer to work out, or grasp intuitively, that the supposition mentioned in (2) is required.

Conversational Implicatures

- S implicates q by saying p to H if

  1. S and H presume that S acts in line with the maxims and principle
  2. q is required to maintain that 1. holds.
  3. S believes that H can work out step 2., and S believes that H believes S believes that H can work out step 2.

- For working out q, H can use the conventional meaning of the words, the principle and maxims, the context, background knowledge, the assumption that the aforementioned information is shared.

Examples

- **Group A** (no direct violation)

  A: I am out of petrol

  B: There is a garage around the corner

  A: Smith doesn't have a girlfriend these days

  B: He has been paying a lot of visits to New York lately

- **Group B** (clashes)

  A: Where does C live.

  B: Somewhere in the South of France

Examples

- **Group C**: (exploitation)

  “Dear Sir, Mr. X’s command of English is excellent, and his attendance at tutorials has been regular. Yours etc.”

  A: Is p the case?
  B: Yes, because r and what’s more C told me …

  You are the cream in my coffee

Examples

A: Mrs X. is an old bag

B: The weather has been quite delightful this summer.

I sought to tell my love, love that never told can be.

Miss X sang “Home Sweet Home” vs.

Miss X produced a series of sounds that corresponded closely with the score of “Home Sweet Home”

Properties of Conversational Implicatures

1. Can be cancelled (since it is possible to opt out).
2. Nondetachability. (try, attempt, endeavored).
3. Not part of the meaning (related to point 1).
4. The implicature is associated/triggered by the act of saying.
5. Multiple alternative implicatures are possible.

Some problems

- Cancellability: Moore's Paradox
- Unpredictability. Take quality, if it is violated, then what do we do (take the opposite, a feature, …)?
- What about imperatives and interrogatives?

The case of “or”

- P or Q means P v Q

  I.e., one of following is the case:

  P is true and Q is false
  P is false and Q is true
  P is true and Q is true

- Normally if we say P or Q we assume that there is a reasonable argument with P or Q as its conclusion, but it does not proceed via P itself or Q itself.

The case of “or”

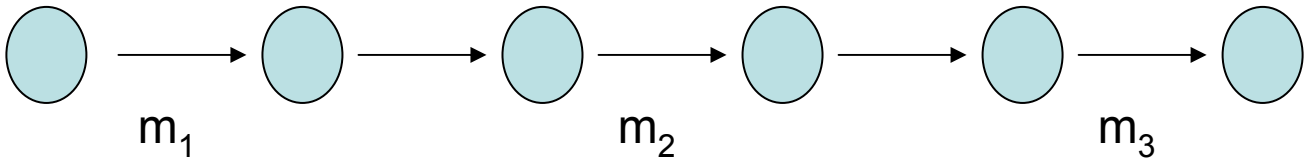
1. Is this an implicature (quantity) or part of the meaning?
2. Test sentence: The eggs are either in the garden or in the attic.
3. But couldn’t we say that this is a case of ambiguity?
4. Grice’s Modified Occam’s Razor: *Senses are not to be multiplied beyond necessity.*

Implication for Dialogue Games

Speaker perspective: in information state *s,* always apply a generation rule whose preconditions are satisfied by *s*.

Flexible speaker perspective: given information state *s*, and class of target states *S'*, use a rule which results in *S'* applied to *s''*, such that H can work out *s''* from *s*.

Implication for Dialogue Games



Assumption: left-to-right incremental analysis

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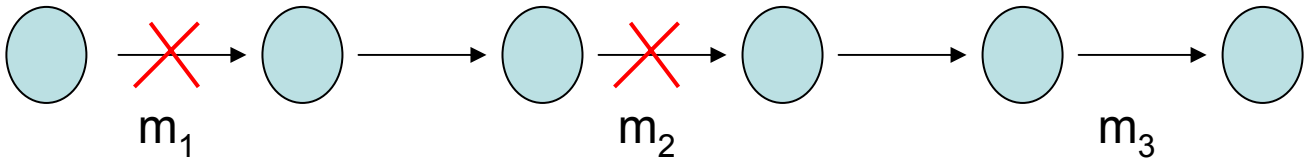

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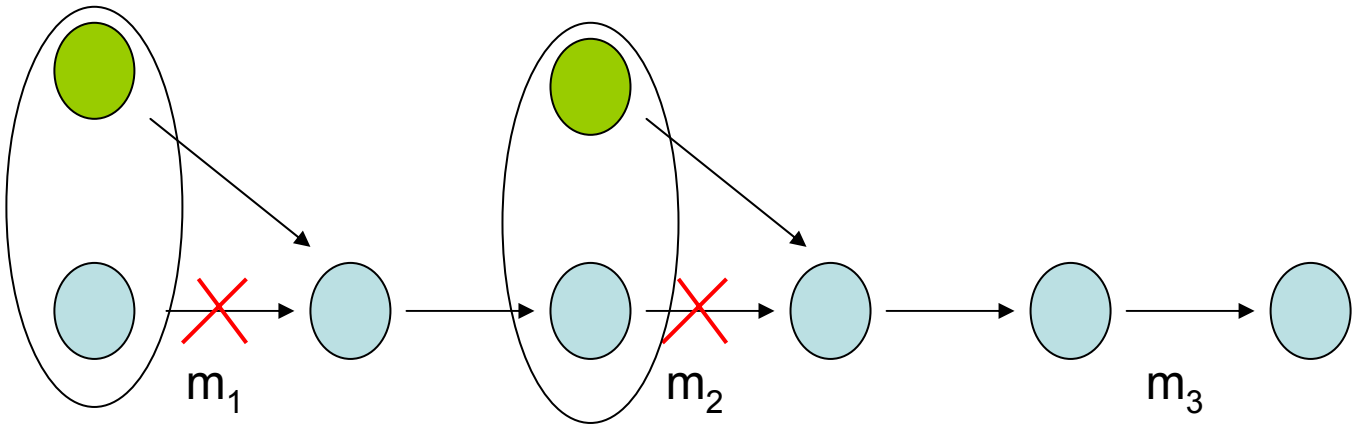

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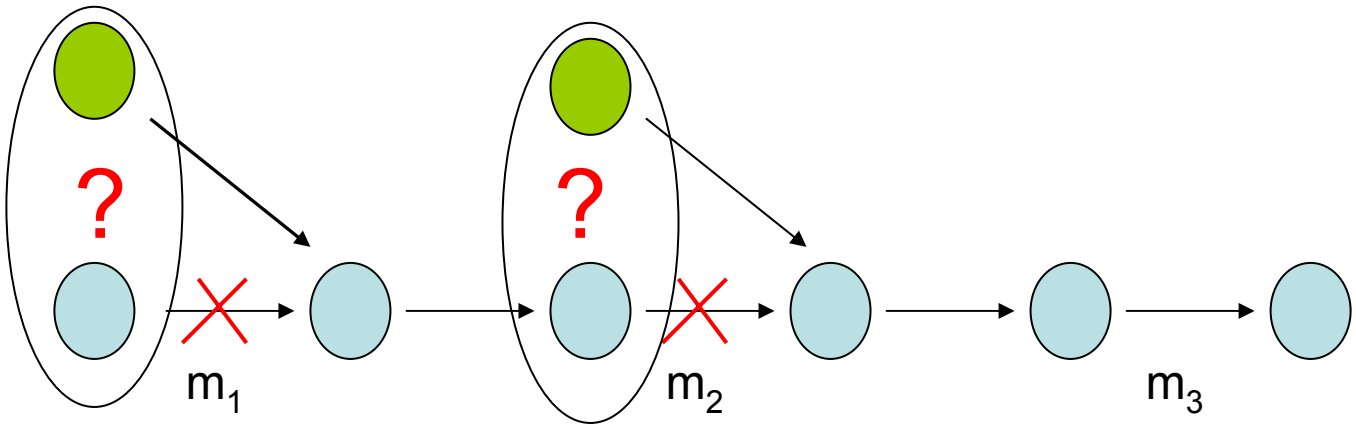


Assumption: left-to-right incremental analysis

Concluding remarks: Notion of a dialogue game

A *dialogue game* is a more or less formalized set of rules that describe or regulate the conduct of the participants of a dialogue.

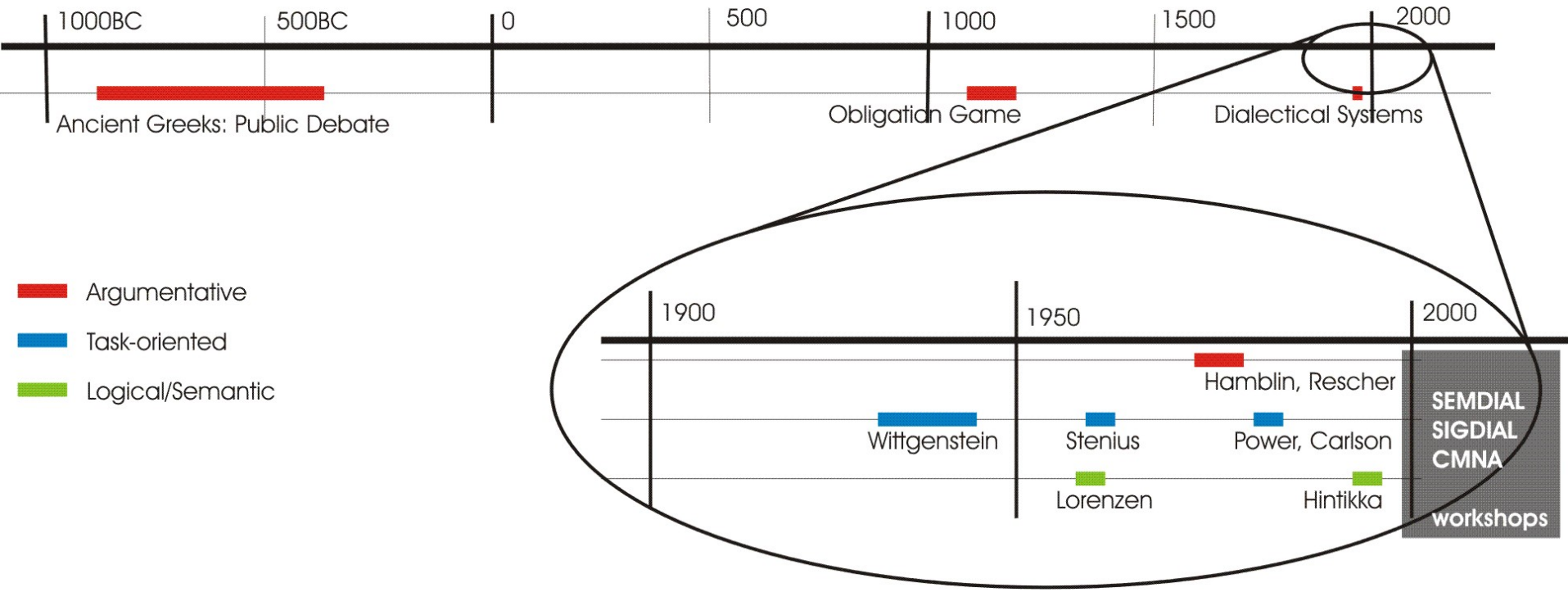
Typically, a dialogue game specifies:

- Participants
- Initial situation/Starting position
- Goal situation(s)/Purpose
- Locutions
- Rules and roles: permitted/prohibited actions, abilities, …

Concluding remarks: Issues

- Dialogue games historically (normative, descriptive, instrumental, formal)
- Normative dialogue games: What does the dialogue game board represent? Beliefs, commitments (light/dark-side, concessions), …?
- Descriptive dialogue games:
  - How to model the *purpose* of a move in a dialogue game
  - What do *dialogue game rules* look like?
- Various problems with dialogue game rules (methodological and empirical)

Concluding remarks: Chronology



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Questions?

Thank you!

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