Grounding in Conversations

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Outline

- What is grounding?
- Grounding techniques
- Costs of grounding
- Summary

What is Grounding?

The Problem of Grounding

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- One person speaks

The Problem of Grounding

- ▶ One person speaks
- ▶ Another person listens

The Problem of Grounding

- ▶ One person speaks
- ▶ Another person listens
- ▶ How do the speaker and the listener can be sure that the listener understands what the speaker means.

What is Grounding?

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- Assumes they speak the same language

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- Assumes they speak the same language
- Builds a knowledge base

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- Assumes they speak the same language
- Builds a knowledge base
- Effected by the environment

What is Grounding?

- Assumes they speak the same language
- Builds a knowledge base
- Effected by the environment
- Done by both dialogue partners

Standard Form of Grounding

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▶ Grounding consists of two phases

Standard Form of Grounding

- Grounding consists of two phases
- Phase 1: Presentation phase
    A presents a thought

Standard Form of Grounding

- Grounding consists of two phases
- Phase 1: Presentation phase
   A presents a thought
- Phase 2: Acceptance phase
   B accepts the thought or clarifies it

Grounding Techniques

Natural Grounding Techniques

Natural Grounding Techniques

- Humans use grounding

Natural Grounding Techniques

- ▶ Humans use grounding
- ▶ Frequently in every day life

Natural Grounding Techniques

- Humans use grounding
- Frequently in every day life
- Various forms of grounding

Natural Grounding Techniques

- Humans use grounding
- Frequently in every day life
- Various forms of grounding
- Depend on the circumstances

Grounding with Questions

Grounding with Questions

- Ex. A: Mr. Meyer has a thing.
    B: What does he have?
    A: A dog.

Grounding with Questions

- Ex. A: Mr. Meyer has a thing.
  B: What does he have?
  A: A dog.

- Ex. A: Mr. Meyer has a m-dog.
  B: A dog?
  A: yes.

Grounding with Questions

- Ex. A: Mr. Meyer has a thing.
    B: What does he have?
    A: A dog.
- Ex. A: Mr. Meyer has a m-dog.
    B: A dog?
    A: yes.
- B asks about what he did not understand

Grounding by Reference

Grounding by Reference

- Ex.   A: Mr. Meyer has a dog.
         B: Thomas Meyer?

Grounding by Reference

- Ex. A: Mr. Meyer has a dog.
       B: Thomas Meyer?
- B gives more information to clarify a certain aspect

Grounding Verbatim Content

Grounding Verbatim Content

- Ex.　A: The number is 0-4-0.
      B: 0-4-0.

Grounding Verbatim Content

- Ex.   A: The number is 0-4-0.
         B: 0-4-0.
- B repeats the important parts word by word

Grounding by Accepting Noises

Grounding by Accepting Noises

- Ex.   A: Mr. Meyer has a dog, you know?
        B: Yeah.

Grounding by Accepting Noises

- Ex. A: Mr. Meyer has a dog, you know?
       B: Yeah.
- A searches for evidence that he has been heard and understood

Grounding by Accepting Noises

- Ex. A: Mr. Meyer has a dog, you know?
  B: Yeah.

- A searches for evidence that he has been heard and understood

- Ex. A: Mr. Meyer has a dog.
  B nods: hm.

Grounding by Accepting Noises

- Ex. A: Mr. Meyer has a dog, you know?
       B: Yeah.
- A searches for evidence that he has been heard and understood
- Ex. A: Mr. Meyer has a dog.
       B nods: hm.
- B gives signs that he listened and understood

Contraints on Grounding

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- Copresence: same environment

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- Visibility: partners see each other

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- Audibility: speaking with sound

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Contraints on Grounding

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- Visibility: partners see each other
- Audibility: speaking with sound
- Simultaneity: no delay
- Sequentially: alternating conversation
- Reviewability: review other massage
- Revisability: review own massage

How do the constraints effect grounding? In what conversations do they occur?

- Copresence
- Grounding with questions
- Visibility
- Grounding by reference
- Audibility
- Grounding verbatim content
- Simultaneity
- Grounding by accepting noises
- Sequentially
- Reviewability
- Revisability

Costs of Grounding

Generell Concept

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- ▶ Grounding takes effort

Generell Concept

- ▶ Grounding takes effort
- ▶ Humans are generally lazy

Generell Concept

- Grounding takes effort
- Humans are generally lazy
- Is done by both dialog partners

Generell Concept

- Grounding takes effort
- Is done by both dialog partners
- Humans are generally lazy

$\rightarrow$ Least collaborative effort

Costs of A

Costs of A

- ▶ Formulation costs

Costs of A

- ▶ Formulation costs
- ▶ Production costs

Cost of B

Cost of B

- ▶ Reception costs

Cost of B

- ▶ Reception costs
- ▶ Understanding costs

Shared Costs

Shared Costs

- Start-up costs

Shared Costs

- Start-up costs
- Delay costs

Shared Costs

- Start-up costs
- Delay costs
- Asynchrony costs

Shared Costs

- Start-up costs
- Delay costs
- Asynchrony costs
- Fault costs

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- Start-up costs
- Delay costs
- Asynchrony costs
- Fault costs
- Repair costs

Shared Costs

- Start-up costs
- Delay costs
- Asynchrony costs
- Fault costs
- Repair costs
- etc.

Summary

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- Grounding defines the dialog topic

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- ▶ Grounding defines the dialog topic
- ▶ Occurs in natural conversations

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- Occurs in natural conversations
- Different techniques

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- Depend on the medium

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- Grounding defines the dialog topic
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- Different techniques
- Depend on the medium
- Need effort of both dialogue partners

Summary

- Grounding defines the dialog topic
- Occurs in natural conversations
- Different techniques
- Depend on the medium
- Need effort of both dialogue partners
- Difficult to model

Thank you for your attention!