

# Common Ground and Granularity of Referring Expressions

Raquel Fernández

Institute for Logic, Language & Computation  
University of Amsterdam



(in collaboration with Dale Barr and Kees van Deemter)

# Overview

## Common Ground and Granularity of Referring Expressions

- New project (to start early 2011) supported by **EURO-XP**RAG: ESF Networking Programme on Experimental Pragmatics.

In collaboration with:

- \* **Dale Barr**, Institute of Neuroscience and Psychology (Glasgow)
  - \* **Kees van Deemter**, Computing Dept., King's College (Aberdeen)
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- Outline of today's presentation:
    - \* Aims and motivation behind the project
    - \* Issues under investigation
    - \* Planned experimental methodology

# Aims

**Main aim:** to investigate experimentally the context dependent nature of *granularity* with a focus on *audience design*.

- reality can be conceptualised at different levels of granularity;
- what constitutes an appropriate level of granularity is context-dependent;
- to what extent does the level of granularity depend on the speaker's model of the hearer and their common ground?

“The speaker designs his utterance in such a way that he has good reason to believe that the addressees can readily and uniquely compute what he meant on the basis of the utterance along with the rest of their common ground.” (Clark, Schreuder & Buttrick, 1983)

Similar ideas of “optimal design” are assumed by many pragmatic theories (Gricean pragmatics, relevance theory, . . .)

# Audience Design

Audience design / Perspective taking / Partner-specific adaptation has been studied in several areas of psycholinguistic research dealing with language production:

- *Prosody and articulation*: do speakers hyper- and hypo-articulate to suit the needs of their listeners?
  - \* faster articulation with repeated mention  $\rightsquigarrow$  *for the listener?*
- *Syntactic choice*: do speakers pay attention to ease of comprehension when choosing between ambiguous and unambiguous forms?

Put the penguin (that's) in the cup above the key.



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- *Syntactic choice*: do speakers pay attention to ease of comprehension when choosing between ambiguous and unambiguous forms?
- *Referent conceptualisation*: do speakers produce referring expressions that are tailored to specific listeners?



'The leather shoe' vs. 'Fido's toy'

# Audience Design and Granularity

At a coarser level of granularity fewer distinctions are made:

flower	vs.	carnation
heart attack	vs.	myocardial infarction
100km	vs.	103km

- *Rounded time expressions* (van der Henst et al. 2002; Gibbs & Bryant 2008): speakers show a strong tendency to give round answers when asked for the time even when wearing a digital watch.
  - \* assumes round answers are easier to process;
  - \* priority of relevance over strict truthfulness.
- *Specificity of lexical choice* (e.g. Brennan & Clark 1996; Barr & Keysar 2002): speakers and listeners rely on partner-specific precedents even when these become overinformative.
  - \* neutral context triggers basic-level terms;
  - \* priority of joint facts over informational optimality;
  - \* expected by listener (no false inferences)

# Audience Design?

We find evidence for and against audience design in the literature.

- Speakers can produce utterances that reflect partner-oriented adaptations and certain sensitivity to the needs of the listener.
- However, elaborate reasoning that requires a model of the listener's mental states seems too cognitively demanding.



# Psychological Theories of Audience Design

- *Initial design*
  - \* utterance plan is informed from the start by common ground
  - \* language users maintain specialised memory structures (“reference diaries”; Clark & Marshall, 1981)
- *Monitoring and adjustment* (Brown & Dell, 1991; Ferreira & Dell, 2000; Horton & Keysar, 1996)
  - \* initial plan is based on egocentric accessibility
  - \* adjustment to addressee is optional/effortful/insufficient
- *Ordinary memory* (Gerrig & McKoon, 1998; Horton & Gerrig, 2005; Shintel & Keysar 2009)
  - \* no intentional adaptation
  - \* addressees as retrieval cues
- *Dual process* (Bard et al. 2000; Bard & Aylett, 2005; Rossnagel, 2000)
  - \* some processes are automatic and not subject to audience design
  - \* some are controlled and may be influenced by audience design

# Research Questions

- Questions within the *audience-design debate*:
  - \* what information about listeners' knowledge speakers actually do notice and use in planning their utterances?
  - \* how and when do they use that information?
  - \* do we get the impression that speakers are using complex information, when in fact some simpler process is at work?
- Our project: questions re. *audience design and granularity*:
  - \* do speakers show partner-specific effects when it comes to choosing a level of granularity?
  - \* if so, to what extent does this adaptation rely on high level reasoning that requires theory of mind?
  - \* are there egocentric factors that play a role?

# Experimental Methodology

General methodology: *referential communication*

a speaker and a listener perform a collaborative task in which the speaker uses language to identify a referent for the listener from a visually presented array of objects

- *Production experiment*: to what extent do speakers choose the level of granularity of their referring expressions taking into account their common ground with the listener?
  - \* **Training phase**: repeated identification of a particular target object (with fillers and competitors) for one particular addressee.
  - \* **Test phase**: target object with different competitor objects and different listeners.

Does the speaker modify the referring expression used for the target object when addressing different listeners?

# Experimental Methodology

- What are the processing demands of expressions at different granularities, e.g. vague (evaluative) vs. precise (numeric)?
  - \* need answer to this question if audience design involves minimising the effort of the listener.
- *Comprehension experiment*: use of eye-tracking methodology to test the comprehension effort required by expressions at different levels of granularity in different contexts.
  - \* by conducting the production experiment first, we can ensure that the expressions used in the comprehension experiment are natural.

# Summing Up

- Our main aim is to study to what extent granularity is subject to audience design.
  - \* contribute to the audience-design debate;
  - \* shed some light on the empirical basis for key assumption behind pragmatic theories.
- We also aim at evaluating the processing demands of different granularity levels, for the speaker and the hearer:
  - \* do numerical expressions impose special demands?
  - \* what are the differences between vague and precise expressions?
  - \* what are the costs of shifting to a finer or coarser granularity?

*thank you*