Pragmatic effects on reference resolution in a collaborative task: evidence from eye movements Hanna & Tanenhaus (2004)

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20.01.2014

Goal

- on-line language comprehension in face-to-face interactive conversation / instruction
- do addressees make **immediate** use of speaker-based constraints during reference resolution?

Goal

- answer to Keysar et al. (2000)
  - do not see reference solution as primarily egocentric
  - think constraints used very early on
  - do not agree with setup: potential referents that speaker cannot see have to be ignored though very salient $\rightarrow$ provokes egocentric constraints

Participants & instructions before starting

- **Helpers (H)**: 12 native English speakers
- instructions to helpers
  - follow recipes that simulated real ones $\rightarrow$ role = cook's helper
  - move objects from his own area, because C cannot reach them
  - move object from C's area when C is in the middle of sth.
  - allowed to ask for clarification
  - head-mounted eye tracker

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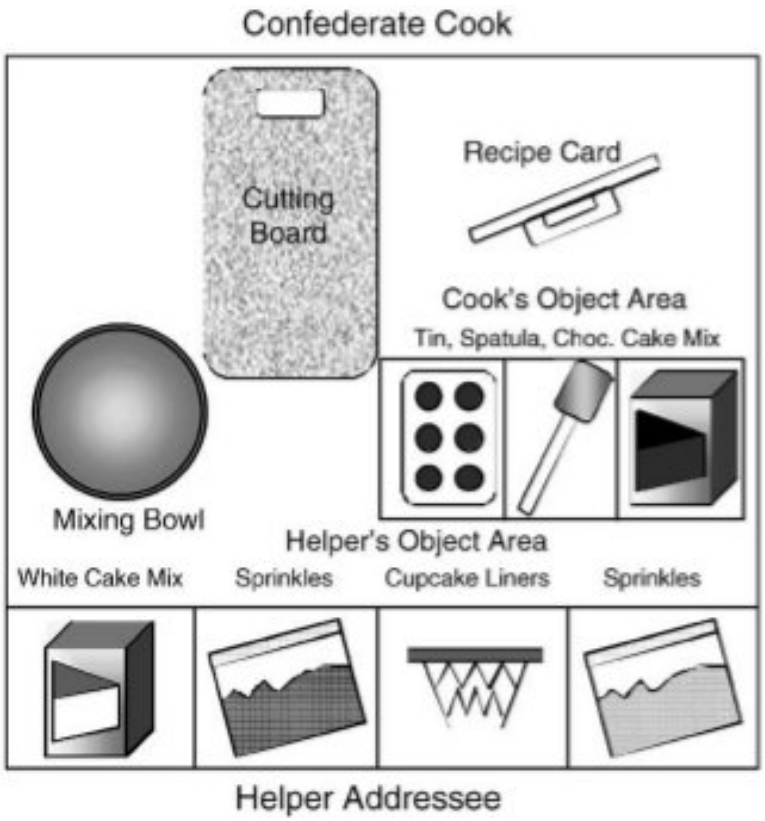
- **Cook (C)**: trained undergraduate research assistant
  - sunglasses
  - is given recipe card by experimentor
  - asks experimentor for necessary objects (mixing bowl, burner)
  - reads / gives instructions from recipe

Setup



- 40 inch square table
- H's object area: 4 spaces
- C's object area: 3 spaces
- equally distant from C and H
- either mixing bowl or burner located next to cutting board
- vertical mount for recipe cards H could not see it
- objects: common kitchen ware
- **critical objects**: on both H's & C's side, modified along either a kind or size dimension

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- sample version
  - 1a/b. Okay, I need to put the spatula in the mixing bowl.
  - 2a/b. Could you hand me the cupcake liners?
  - 3a/b. I need to put the liners in the cupcake tin
  - 4a. And could you put the cake mix next to the mixing bowl?
  - 4b. Oh first could you put the cake mix next to the mixing bowl?
  - 5a/b. And also hand me the chocolate sprinkles.

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  - 1 critical instruction: contains referring expression without modifying adjective (the cake mix)
  - 1 final instruction either to C or H

Instruction / Scripts - Critical Instruction

FACTORS (2x2)

- **Hands / Situation of C**
  - **hands empty condition**
    - potential occupying action (step before) has been completed
    - H's were asked: "And could oyu put the [unmodified object name] next to the cutting board"

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- **Matching object(s)**
  - **1 object** on H's side
  - **2 objects**: 1 on H's side & 1 on C's side

Instruction / Scripts - Critical Instruction

		hands	
objects		empty	full
	1		
	2		

Instructions / Scripts - Distractors

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- always completed before next instruction
- also use another set of two objects that vary along a dimension
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- always completed before next instruction
- also use another set of two objects that vary along a dimension
  $\rightarrow$ referred to with modifying adjective (the big spoon)
- reinforcing C's preference to move an object from her own space when she could
  - hands empty & two objects
  - "mistakenly" directed at H and then repaired by C
  - C: "And could you put the pie tin..." "Actually I can put the large pie tin on the cutting board"

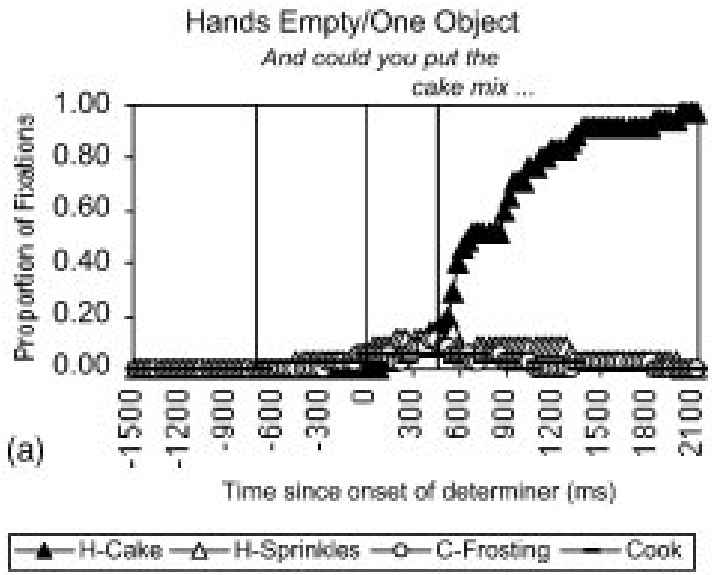
Hypothesis

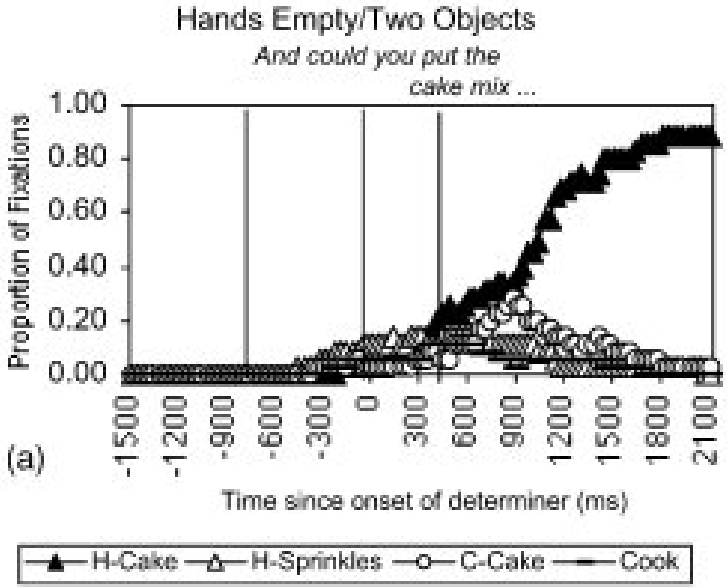
- an addressee can take into account the speaker's pragmatic constraints quickly enough to influence the initial domain of interpretation for a definite NP

Predictions

		hands	
objects		empty	full
	1	domain restricted to H's side fixates & takes object on his side	domain is restricted to H's side fixates & takes object on his side
	2	domain restricted to H's side fixates & takes object on his side	domain widens to H's & C's side fixates both objects asks for clarification

Results


Hands Empty/One Object
And could you put the
cake mix ...
Proportion of Fixations
1.00
0.80
0.60
0.40
0.20
0.00
-1500
-1200
-900
-600
-300
0
300
600
900
1200
1500
1800
2100
(a)
Time since onset of determiner (ms)
H-Cake
H-Sprinkles
C-Frosting
Cook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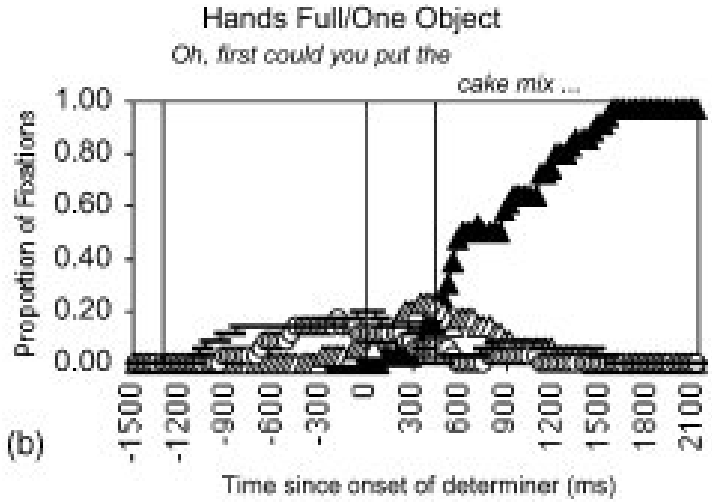
Hands Full/One Object
Oh, first could you put the
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0.20
0.00
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-900
-600
-300
0
300
600
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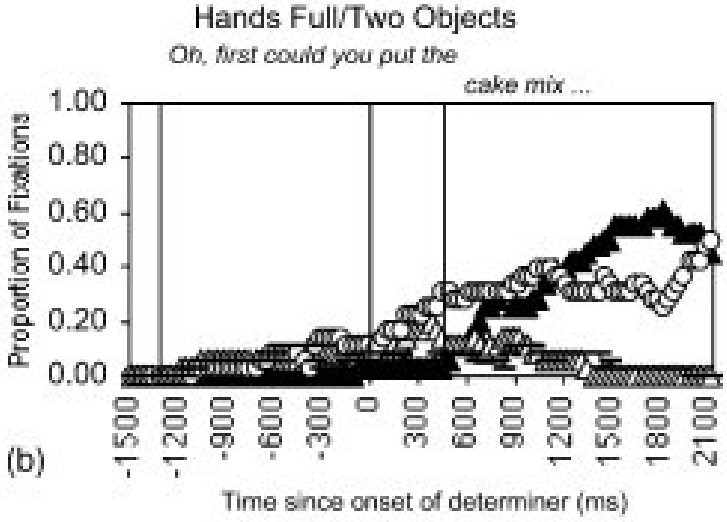
1200
1500
1800
2100
(b)
Time since onset of determiner (ms)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(b)
Time since onset of determiner (ms)

Results

- as predicted, in the hands full - two objects condition, the helper's domain widens to the helper's and the cook's part of the setup
- this happens already during the object name
- according to this research, the addressee can take into account the speaker's pragmatic constraints quickly enough to influence the initial domain of interpretation for a definite NP

Discussion

- non-verbal cues despite sunglasses?
- no comparison between fixations on different objects in total, only in the different conditions (only done in ANOVA)
- clues given through the different formulations of the instruction
  - I & you
  - preamble for hands full condition: Oh, first could you

Keysar et al. vs Hanna and Tanenhaus

- Keysar et al.
  - if common ground is used $\rightarrow$ late during resolution process
  - common ground reduces probability of considering a non-shared object
  - common ground for error correction
- Hanna and Tanenhaus
  - shared information & constraints of speaker used very early in resolution process
  - common ground is used routinely, to avoid errors from beginning, not for correction