



# Formulating for Another

Arne Zeschel  
Kerstin Fischer





# The Problem

## Recipient Design

“the multitude of respects in which the talk by a party in a conversation is constructed or designed in ways which display an orientation and sensitivity to the particular other(s) who are the co-participants” (Sacks, Schegloff & Jefferson 1974: 727)





# The Problem

## Recipient Design

“the **multitude of respects** in which the talk by a party in a conversation is constructed or designed in ways which **display an orientation and sensitivity** to **the particular other(s)** who are the co-participants” (Sacks, Schegloff & Jefferson 1974: 727)





# The Problem

- **selecting linguistic features**
- **from a set of possible choices**
- **based on what is considered most suitable for the participant**
  - what does the recipient consist in? (cf. Schegloff 1997)
  - what does the set of possibilities consist in?
    - memory limitations, lack of attention, entrenchment
    - creativity, idiosyncratic use
  - what is the basis for postulating a relationship between a recipient and a linguistic feature?



# Methods: CA

## attended to dimensions

- clarification questions (Schegloff 1972)
- reformulations: display of formulation alternatives

choices attended to

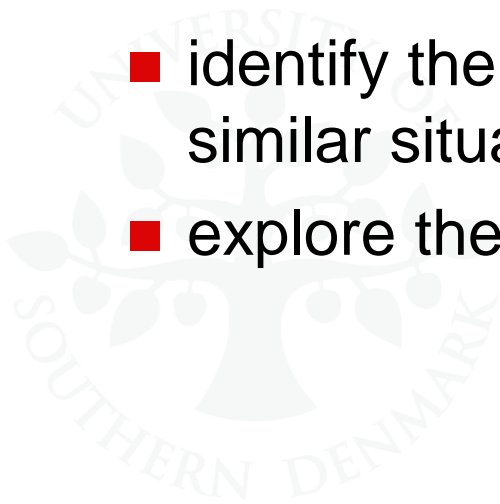
not  
displayed





# Procedure

- **investigate recipient design in comparable corpora**
  - elicit data in situations that differ only with respect to the addressee
  - identify speakers' own constructions of the communication partner and the situation
  - identify the linguistic choices of groups of speakers in similar situations
  - explore the use of quantitative methods





# Data

## 28 parent-child interactions (Rohlfing et al. 2006)

- both fathers and mothers in interactions with their preverbal children
- tasks:
  - explain lamp**
  - explain bell**
  - stack cups**
  - stack blocks**
  - put rings in box**
  - put salt on**





# Data

## 30 human-robot interactions

- **simulated robot**
  - attention to
    - **movements**
    - **colours**
    - **skin**
  - tasks as in CDS





# Clarification Questions

<b>topic</b>	<b>example</b>
task	vp017: <i>Größe? Form? Farbe? Was soll ich erklären?</i> (size? form? colour? what am I supposed to explain?)
cognitive capabilities	vp013: <i>siehst Du das? kannst Du denn so schnell folgen?</i> (do you see this? can you follow that quickly?)
linguistic capabilities	vp018: <i>Schwerpunkt wird Dir wahrscheinlich nichts sagen</i> (point of ballance will probably not mean anything to you)
interactional capabilities	vp003: <i>wie kann ich ihm jetzt abluchsen, ob er mich verstanden hat?</i> (how can I make him reveal whether he has understood me?)



# Clarification Questions

- in HRI but not in CDS
- reveal insecurity about how to address a robot, but not a child
- display speakers' hypotheses about their addressees cognitive, linguistic and interactional capabilities
- useful methodological tool in unfamiliar situations, but not for familiar addressees



# Reformulations

*also pass auf, Gerry, das ist das, was wir daheim auch immer machen.*

*okay look, Gerry, this is what we keep doing at home as well.*

*Achtung, eins zwei oh und jetzt klingelt es.*

*watch out, one two oh and now it rings.*

*hast du gesehen.*

*did you see that.*

*sollen wir nochmal.*

*shall we do it again.*

*eins zwei ui hast du gesehen.*

*one two ui did you see it.*

*da kann man drauf drücken auf den Knopf und dann klingelt es. klasse.*

*you can hit on the button and then it rings. great.*

*das ist wie an der Tür zu Hause, weißt du?*

*that's like at the door at home, you know?*

*(VP006\_1\_AC\_Klingel)*



# Reformulations

*okay look, Gerry,*

*this is what we keep doing at home as well.*

*one two oh*

*and now it rings.*

*did you see that.*

*watch out,*

*that's like at the door at home, you know?*

*one two ui*

*you can hit on the button and then it rings.*

*did you see it.*

In line with Küntay & Slobin (2001)



# Reformulations

*also. das scheint ein Klingelknopf zu sein.*

*der ist unten gelb, oben weiß und einen Drücker, der ist rot.*

*und wenn man da drauf drückt, dann klingelt es hoffentlich.*

*wunderbar.*

*es hört sich an wie ein Fahrradklingelknopf. eine Fahrradklingel.*

*nochmal?*

*dieses ist ein Klingelknopf.*

*mit einem gelben ja, Gehäuse.*

*oben drauf ist das Gehäuse weiß.*

*und ganz oben drauf auf dem*

*Klingelknopf ist ein Drücker, ein roter Drücker, und wenn man draufdrückt, klingelt es.*

*okay. This seems to be a bell button.*

*it is yellow at the bottom, white on top and a push-button, which is red.*

*and when you press it, then it will ring hopefully.*

*excellent.*

*it sounds like the button of a bike bell. a bike bell*

*again?*

*this is a bell button.*

*with a yellow well, case.*

*on top the case is white.*

*and on the very top on the bell button is a push-button, a red push-button, and when you press it it rings.*

*(vp013\_klingel)*



# Reformulations

**okay. This seems to be a bell button.**

**it is yellow at the bottom,  
white on top**

**and a push-button, which is red.**

**and when you press it, then it will  
ring hopefully.**

**this is a bell button.**

**with a yellow well, case.  
on top the case is white.**

**and on the very top on the bell  
button is a push-button, a red push-  
button,**

**and when you press it it rings.**

- reformulation pairs in both HRI and CDS
- considerable linguistic differences between HRI and CDS
- choices not random
- not revealing regarding recipient design



# Recipient Design in HRI

- **Differences regarding Concept of Communication Partner**
  - 20 of 30 participants requested additional information in HRI, but none in CDS
  - estimated age of robot: range 6 months – 10 years, mean 3.7, SD 2.7
- high variability in HRI



# Comparison CDS – HRI

- **Differences in Complexity**

- number of relative clauses ( $F(1,340) = 16,0699, p < .001$ )

- CDS: mean = 0.04

- HRI: mean = 0.22

- number of direct, indirect objects and object complements ( $F(1,340) = 73,88916, p < .001$ )

- CDS: mean = 1.38

- HRI: mean = 3.68



# Comparison CDS – HRI

- **Differences in Complexity**

- number of abstract terms ( $F(1,340) = 23,89889$ ),  $p < .001$ )

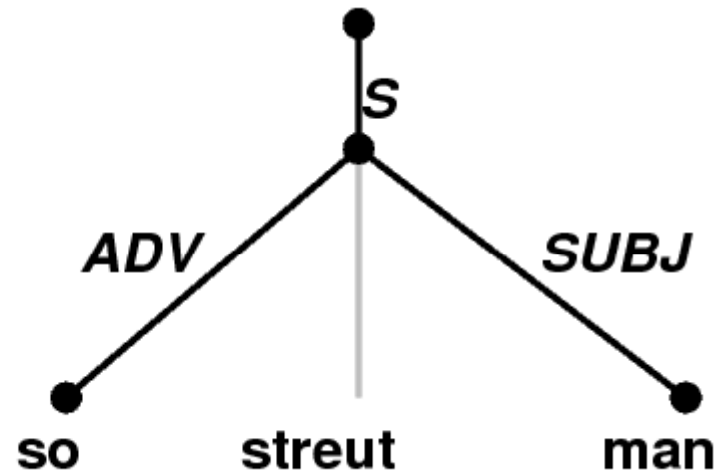
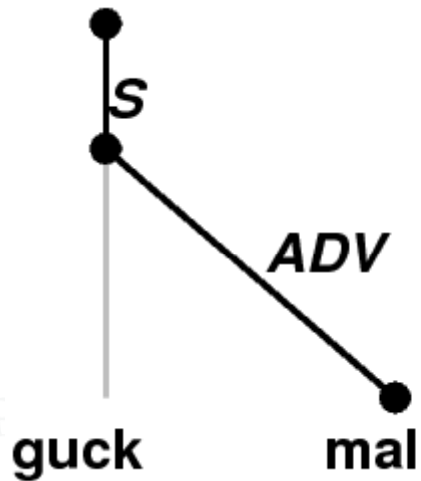
- CDS: mean = 0.0

- HRI: mean = 0.37

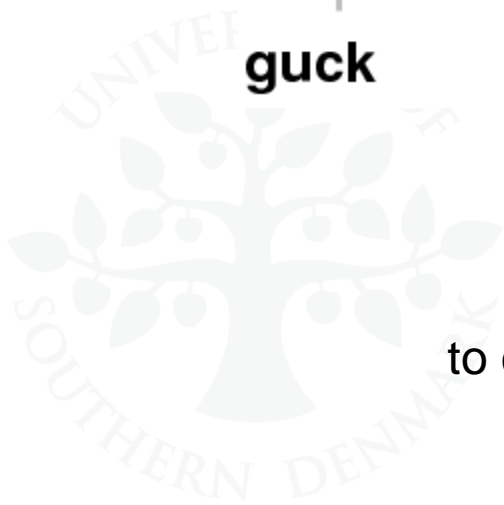




# Comparison CDS – HRI

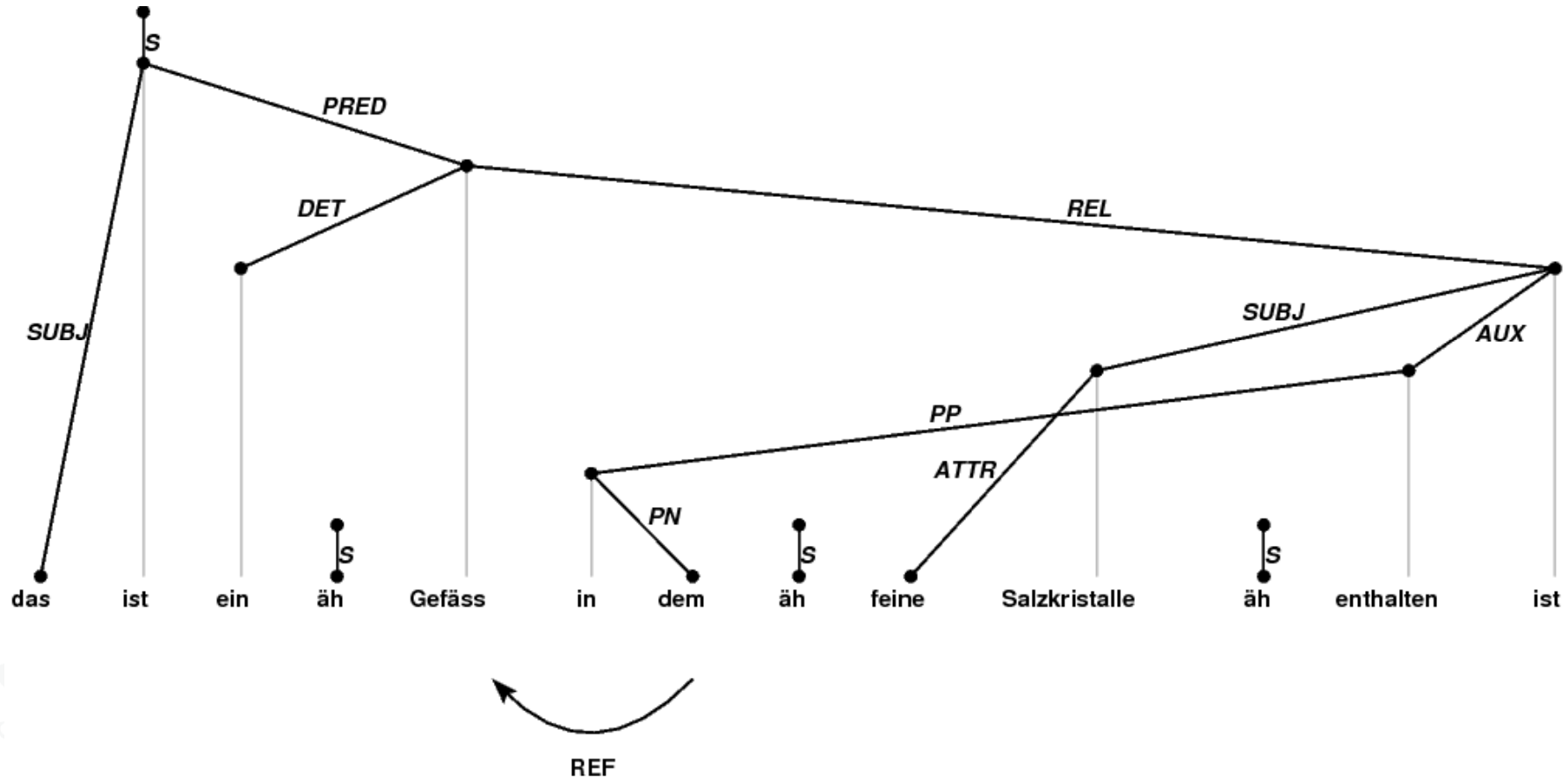


to child: 'Look that's how you put salt on'





# Comparison CDS – HRI



to robot: 'this is an uh container in which uh salt crystals are uh contained'



# Comparison CDS – HRI

- **Differences in verbosity**

- number of words ( $F(1,340) = 14,54830, p < .001$ )

- CDS: mean = 45.5

- HRI: mean = 60.5

- number of different words ( $F(1,340) = 33,66639, p < .001$ )

- CDS: mean = 24.7

- HRI: mean = 34.1



# Statistical Analyses

## Inferential Statistics:

- informs us about which conclusions we are allowed to draw
- tells us which differences are not accidental but systematic

## Descriptive Statistics:

- standard deviation: homogeneous vs. heterogeneous choices
- range: measure of variability
- correlations: which choices go together



# Descriptive Statistics

- **direct, indirect objects and object complements:**
  - CDS mean 1,38889, range 0 – 12, standard deviation 1,77018.
  - HRI mean 3,68333, range 0 – 16, standard deviation 2,95303
  - CDS: homogeneous
  - HRI: heterogeneous



# Relationship Other – Linguistic Choice

so far:

- systematic differences between the two situations
- CDS: homogeneous vs. HRI: heterogeneous

can we understand the heterogeneity?

- due to the contingencies of talk?
- or due to recipient design for heterogeneous recipients?



- if we do not get direct evidence of ‘the particular other’ and what speakers attend to, perhaps we can use observable consequences of a partner models instead?
- 2.Sg PN ‘*du*’/‘*you*’ as a marker of interactivity

### ***Descriptive Statistics:***

- *correlation: relationship between two observable features*



# Correlations

- **the more interactive (the more instances of ‘you’)**
  - the more direct, indirect objects and object complements ( $r = .45^*$ )
  - the more words ( $r = .52^*$ )
  - the more different words ( $r = .40^*$ )
  - the more concrete nouns ( $r = .52^*$ )
  - the more speakers liked the interaction ( $r = .37^*$ )
  - the more they found it boring ( $r = .38^*$ )



# Results: Summary

## “the particular other“

- problematic in HRI
  - variation of suspected age level
  - clarification questions regarding linguistic and cognitive capabilities
  - heterogeneous linguistic choices concerning complexity and verbosity
  - different degrees of interactivity
- unproblematic in CDS
  - small range, homogeneous
  - no clarification questions



# Results: Summary

## “multitude of respects”

- sets of possibilities limited through situation, i.e. attention only to tip of iceberg
- significant differences between speech to children and to simulated robot





# Results: Summary

## “orientation and sensitivity to particular other”

- we can see what speakers do in comparison and relate it to findings on 'the particular other'
- statistical tests indicate that the differences are systematic and not accidental/due to contingency
- statistical correlations show relationships between indicators of recipient design and linguistic choices



# Conclusion

## Comparison of comparable corpora shows

- choices made by a group of speakers faced with similar tasks
  - homogeneous versus heterogeneous concept of communication partner
  - corresponding to lesser versus greater variability in choice
  - choices differ systematically for different addressees
  - only parts of these choices are attended to
  - statistical methods support qualitative analyses
- limited methodological possibilities:  
recipient design equation with three variables
- methodological plurality necessary



**Thank you!**

