The non-at-issue contributions of gestures and speculations about their origin

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Aim A
(non-at-issueness of gestures)

- Relate the interaction of gesture and speech to 'multidimensional' phenomena
- Show that speech and (certain) speech-accompanying gestures interact in the same way as different dimensions of speech among each other (i.e. 'at issue' vs. 'non-at-issue' material, Potts 2005)

Gesture : Speech
⇔
Non-at issue : At-issue
Aim B
(source for non-at-issueness)

- Speculate on the possible source for the non-at-issueness of speech-accompanying gestures
  a) the nature of gesture as such
  b) their iconic character
  c) the fact that they are speech-accompanying
Aim C
(demonstratives)

- Discuss the role of demonstratives (German *dies-* and *so*)
- Proposal: they act as 'dimension shifter' from non-at-issue to at-issue
Aim D
(formal semantic modeling)

- First attempt towards a formal analysis
- Propose a semantic interpretation for gestures
- Define 'constructional meanings' for alignment of gesture and speech depending on whether the gesture
  (i) accompanies an NP or
  (ii) a (referential) DP, and here
    (ii-a) the associated DP is indefinite
    (ii-b) the associated DP is definite

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Outline

- Some notes on gestures
- Gestures as non-at-issue material (A)
- Source of non-at-issueness (B)
- The role of demonstratives (C)
- Towards a formal analysis (D)
What are gestures?

- Gesture = communicative movements of hands and arms transporting emotions, intentions, and thoughts.
Types of gestures

- Pointing gestures
- Iconic gestures
- Metaphorics
- Emblems
- Beats
Types of gestures relevant for this talk

- Iconic gestures
- Pointing gestures
- Emblems
Corpus examples

- Speech-accompanying iconic gestures
- Taken from the Bielefeld Speech-and-Gesture-Alignment (SaGA) corpus of project B1 *Speech-gesture-alignment of the SFB 673 Alignment in Communication*
- Multimodal corpus (video and audio) collecting dialogues from an experiment where one subject gives directions for navigation through a dynamic virtual world (*Lücking et. al 2013*)
- The corpus is annotated for gestures
A corpus example

Interloc. right: The sculpture, [what is there represented]^{reg-g}?
Interloc. left: It is on a [grey base made of concrete]^{ic-g}. Three meters high. And on it, there are [red tubes]^{ic-g}.
What do these examples show?

- Gesture phrase divides up into three phases (Kendon 1980; McNeill 1992):
  - Preparation phase (preparation, pre-hold)
  - Stroke
  - Retraction phase (post-hold, retraction)
What do these examples show?

- Gesture and speech are temporally aligned:
    [Stroke occurs just before or at the same time as (but not later than) the nuclear accent]
  - gesture phrases and 'tone groups' (i.e. 'the smallest grouping of syllables over which a completed intonation tune occurs', Kendon 1972) / 'information units' (Kendon 1988, cf. Halliday 1985) / 'intermediate phrases' (Loehr 2004) / focus phrases (Ebert, Evert & Wilmes 2011)
What do these examples show?

- Gesture information adds semantic content to the utterance.
- It adds information about the shape of the base (it is round) and the sculpture (shape and arrangement of the tubes).
- Gesture and speech work together to convey one thought (cf. McNeill 1992, Kendon 1980)
Objects of interest

- What exactly is the additional information of the gesture?
- How can it be represented?
- How does it combine with the semantic information from the speech signal?
- What role do demonstratives play?
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Two dimensions within speech

- Recent trend in formal pragmatics: study of ‘multidimensional meanings’, at-issue vs. non-at-issue material (e.g. Potts 2012)
- Words, phrases, and entire sentences can contribute meanings in different ‘dimensions’ (cf. Grice 1975)
- Recent contributions: formal frameworks modeling multidimensionality and making predictions about interactions among these dimensions (Potts 2005, 2007; Gutzmann 2012; Koev 2013; AnderBois et al. to appear among many others)
Two dimensions within speech

- Core phenomena: 'expressives' like *damn* (or 'mixed items' like *cur*) and 'supplements' like appositive relative clauses or appositive NPs
- bring in information that is not at issue at the time of utterance, but sneaked in as ‘secondary’ information
- information is not for disposition, non-negotiable
Non-at-issue material

- Epithets
  
  *That bastard/idiot Kresge is famous.*  
  *Dieser Depp von Peter wusste mal wieder alles besser.*

- Expressive adjectives
  
  *I hear your damn/bloody dog barking.*  
  *Ich habe euren verdammten Hund die ganze Nacht bellen hören.*

- 'Expressively colored' expressions (mixed items)
  
  *This cur howled the whole night.*  
  *Dieser Köter hat die ganze Nacht gejault.*

(Potts 2007, p. 168)
(Potts 2005, p. 18)
(Gutzmann 2012, p.23)
Non-at-issue material

- Appositives

  *Ames, a former spy, is now behind bars.*  
  *Ames, who was a successful spy, is now behind bars.*  
  
  (Potts 2007, p. 90)

  *Paul, der beste Reitlehrer der Welt, unterrichtet in unserem Stall.*  
  *Paul, der sicher der beste Reitlehrer der Welt ist, unterrichtet in unserem Stall.*
Expressives and emblems

- Expressives are comparable to (speech-accompanying) emblematic gestures.
- Both transmit attitudes and feelings, often negative ones, which are also often offensive in an immediate fashion (what Nouwen 2014 characterizes as 'toxic').
- Potts (2012, p. 2532): expressives create ‘a window into [the speaker’s] underlying emotional state at the time of utterance’.
Expressives and emblems

- Parallels:
  a) *Meine Schwester soll noch den nervigen Rasen mähen.*
  b) *Meine Schwester soll noch den [Rasen] mähen.*

- E.g. parallel 'projection' behaviour of negative attitude:
  a)/b): the fact that the sister has to mow the lawn is annoying

- But:
  c) *Meine nervige Schwester soll noch den Rasen mähen.*
  d) *Meine [Schwester] soll noch den Rasen mähen.*

- c)/d): The sister is annoying, no projection to entire event
Appositives and iconic gestures

- Appositives are comparable to (speech-accompanying) iconic gestures
Iconic gestures

Recall corpus example

- Semantic content of the speech signal:
  - The sculpture has a base made of concrete

- Semantic content of the gesture (approximation):
  - The base is round

- Apparent combined semantic content of the signal:
  - \( \text{The sculpture has a round base made of concrete} \)
  - \( \exists x [\text{base}(x) \land \text{of-concrete}(x) \land \text{have}(ty.\text{sculpture}(y),x) \land \text{round}(x)] \)
Gesture and speech

- **BUT**: contribution of gesture and speech of different nature
- **The gesture** contributes **non-at-issue** information

  \[ \text{The sculpture has [a base made of concrete]} \]

- **At issue**: The sculpture has a base made of concrete

  **Not at issue**: The base is round

- Means roughly the same as:

  \[ \text{The sculpture has [a base made of concrete], which is round by the way.} \]
Test cases

- Non-at-issue material is independent of the main assertion (see e.g. Potts 2005)

- Thus, it is predicted that the gestures
  - (a) cannot be denied directly in discourse
  - (b) project, hence they cannot be negated by ordinary negation
  - (c) are not part of what is questioned in interrogatives
Direct denial within speech

• Krifka 2013: *das/that* picks up at-issue assertions

• Direct denial impossible to appositive content:
  
  A: *Ludger Beerbaum, an outstanding show jumper, was accused of doping.*
  
  B: *That's not true! He was not accused of doping! It was actually poling!*
  
  B: #*That's not true! He is no show jumper!*

• Objection to appositive content only with certain effort (cf. presupposition protest):
  
  B: *Hey, wait a minute! Actually, he is no show jumper. He does dressage.*
Direct denial with gestures

A: The sculpture has [a base made of concrete]

Plain contradiction:

B: ✓ That's not true! The base is made of glass (not concrete).

B: #That's not true! The base is square (not round).

'Discourse interrupting' protest is fine:

B: Hey, wait a minute! Actually, the base is square and not round.
Projection within speech

- Negation targets only main clause predicate:

  It is not true that Ludger Beerbaum, an outstanding show jumper, was accused of doping.

  ✓ He was actually accused of poling.

  #He is actually a lousy show jumper.
Projection with gestures

- Negation does not target gesture material:
  
  🗣️ + 👉 I would never buy [a casserole].

  #Lasagne sheets would not fit in properly.

- Compare to:

  🗣️ I would never buy an oval casserole.

  Lasagne sheets would not fit in properly.
Target of question within speech

- Appositive information is not part of the question:

  A: *Have you ever met Paul, the best horse riding instructor in the world?*
  
  B: #No, *but I have met Paul.* (*But I don't agree he is so great.*)
  
  B: *Yes, however, I don't think he is such a great instructor.*
Target of question with gestures

• Gesture material not part of the question:
  
  A: *Did you buy [a casserole] yesterday?*

  B: #No, but I bought a square one.

  B: Yes, but actually it was a square one.

• Compare:

  A: *Did you buy an oval casserole yesterday?*

  B: No, but I bought a square one.

  B: #Yes, but actually it was a square one.
Target of questions
emblems and expressives

- Expressives are not part of the question:
  A: *Have you ever met that bastard Kresge?*  
  B: #No, but I have met Kresge.
  B: *Yes, however, I like him.*

- Emblems:
  A: *Have you met [Paul] recently?*
     + *'balla-ball' gesture*
  B: #No, but I have met Paul. (no additional gesture)
  B: *Yes, but why don't you like him?*
Pilot study
(Ebert in prep. based on Bsc-thesis 2012 by C. Krämer)

pilot rating study: influence of iconic gestures on truth-value judgements

Auf diesem Bild sieht man ein Auto, das auf [einer Straße] fährt
(In this picture, you see a car that drives on a street)

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Pilot study
(Ebert in prep. based on Bsc-thesis 2012 by C. Krämer)

pilot rating study: influence of iconic gestures on truth-value judgements

1. Auf diesem Bild sieht man ein Auto, das auf...
   ...[einer Straße] fährt
   ...[einer Straße] fährt

2. ...einer kurvigen Straße fährt
   ... einer geraden Straße fährt

match vs. mismatch

gesture vs. adjective

3. How well does the description in the video fit the picture?
   □ 5 (perfect)  □ 4 (quite good)  □ 3 (ok)  □ 2 (not so good)  □ 1 (not at all)
Pilot study
(Ebert in prep. based on Bsc-thesis 2012 by C. Krämer)

- materials:
  12 experimental items (no fillers)

- independent variables:
  MATCH: match vs. mismatch
  MODE: gesture vs. adjective

- participants:
  20 students of the University of Stuttgart; native speakers of German

expectation: gesture mismatch >> adjective mismatch

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Pilot study
(Ebert in prep. based on Bsc-thesis 2012 by C. Krämer)

Gestures as non-at-issue material

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Experimental studies

- Pilot study on iconic gestures: mismatching gesture (= non-at-issue) information does not influence truth value judgements in the same way as mismatching adjective information (=at-issue information)

- currently under design:
  - fullfledged experiment along the lines of the pilot study
  - same experiment contrasting appositives and adjectives (see Syrett et al. to appear for two experiments on truth value judgements with appositives; result: no difference between contribution of appositives and at-issue material)
✓ Aim A

- Gesture contributions are not at issue
- Well, ... actually we have seen that: **speech-accompanying iconic and emblematic gestures** are not at issue
Outline

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The source of non-at-issueness

- What is the source of the non-at-issueness of the gestures we have seen so far?

- 3 hypotheses:
  - a) the nature of gesture as such
  - b) their iconic character
  - c) the fact that they are speech-accompanying
The nature of gesture

- Hypothesis (a) seems not tenable

- **Ladewig (2012):** speech-replacing gestures are capable of conveying meaning on their own without speech; they are often not emblematic, but what Müller (1998) calls 'referential'

- To yield the intended combined meaning with the speech-signal, the meaning of speech-replacing gestures has to enter the at-issue dimension

  a) **A:** Have you met Paul recently?
     B: shakes head.

  b) **Can you pass me the []?** + iconic 'shape' gesture

  c) **Heute waren wir [].** + iconic 'swim' gesture
Iconicity

- What about hypothesis (b)?
- So far: iconic gestures and emblematic gestures
- Iconic gestures are maximally iconic, but also emblematic gestures involve some degree of iconicity
- Is iconicity the driving force for non-at-issue interpretation? (p.c. with Klaus von Heusinger)

Test cases:
- Other types of gestures that involve iconicity to a lesser extent, i.e. pointing gestures (Prediction: they contribute at issue)
- Other types of iconic signs like ideophones within spoken languages (p.c. with Manfred Krifka) and iconic signs in sign languages (p.c. with Philippe Schlenker) (Prediction: they contribute non-at-issue)
Sign languages

- Well-known that iconicity plays an important role in sign languages: many productive non-conventionalized signs and expression types
- One example: GROW in DGS (see Schlenker to appear for a related example in ASL)
- Depending on what grows, the sign looks different
- Also, iconic realization possibilities: The group grew
  - signer can vary distance between the endpoints and speed
  - small and slow movement = minor and slow growing process
  - big and quick movement = quick growing process
- A matter for intensive research whether these iconic meaning components can be interpreted at issue or not
Ideophones

- Definition (Dingemanse): ‘marked words that vividly evoke sensory events’ like *bolterdipolter*
- Play a far more significant role in many African and Asian languages (cf. e.g. Dingemanse 2012)
- Can be seen as vocal gestures (e.g., they often have onomatopoetic, i.e. iconic, properties, cf. also phonaesthemes, Firth 1964)
- Fixed inventory or productive?
- Are they non-at-issue??
  
a) *Er kam bolterdipolter die Treppe herunter.*  
b) A: *Wie kam er die Treppe herunter?* B: ??*Holterdipolter*  
c) *Das kann nicht Peter sein.*  
  ??*Er würde niemals bolterdipolter die Treppe runterkommen.*  
  *Er würde niemals so bolterdipolter die Treppe runterkommen.*
Pointing gestures

• What is the contribution of a pointing gesture?

• Example with indefinite:
  \( \text{The sculpture has [a base made of concrete]} \)

• Claim: The base of the sculpture talked about must be similar to the base of the sculpture pointed at

• We will come back to that question and compare the contribution of gestures accompanying indefinites, definites, and NPs

• For now: do pointing gestures contribute at issue or not?

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Pointing gestures
Independence

• Indefinite with pointing gesture (to casserole in shop window):

  a) A: *Peter hat sich gestern [eine Auflaufform] gekauft.*

      
      

      B: *Stimmt. Allerdings war sie eckig und weiß.*

      B': #Stimmt nicht. *Er hat sich eine eckige weiße gekauft.*

      B'': *Stimmt nicht. Er hat sich eine Schüssel gekauft.*


      
      

      A: #Da passen Lasagneblätter ja gar nicht rein.

⇒ The contribution of the pointing gesture is not at issue
Pointing gestures

Independence

• Indefinite with pointing gesture (to casserole in shop window):

c)  A: Hast Du gestern [eine Auflaufform] gekauft?

        👉  🍴

   B: #Nein, aber ich hab eine eckige weiße gekauft.

   B: Ja, allerdings war sie eckig und weiß.

⇒ The contribution of the pointing gesture is not at issue
Iconicity and non-at-issueness

• Not clear whether iconicity is the driving force for non-at-issueness
• Future project to research into this question
• First hints:
  • Pointing gestures probably contribute not at issue (-)
  • Ideophones are probably not at issue (+)
  • Iconic elements in sign languages can probably be at issue (-)
  • Iconic speech-replacing gestures can be at issue (-)
Speech-accompanying function

- To be investigated: hypothesis (c)
- Because they come in a different mode, speech-accompanying gestures are naturally 'secondary'
- So far no evidence against this hypothesis, but it is only a default as we will see...
✓Aim B

- Iconicity might be (partly) responsible for the non-at-issue status of the gestures at hand
- Probably, it is also their speech-accompanying character
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- The role of demonstratives (C)
- Towards a formal analysis (D)
so as dimension shifter

- Speech-accompanying gestures are not at issue by default (as shown), but they can be made at issue via the use of demonstratives.

- E.g. by way of the demonstrative so (such a) or dies- (this).

- Cf. Fricke 2012, Umbach & Ebert 2009, Streeck 2002 for placeholder-function of so (such a) and Cassell et. al. 1999 for dies- (this).

- The demonstrative so functions like a dimension shifter (from non-at-issue to at-issue, pace Potts 2005, 2007 and Gutzmann 2012).
so as dimension shifter

direct denial

• With *so*, gesture material can be denied directly:

  A: *Die Skulptur hat [SO einen Betonsockel].*

  B: *Das stimmt nicht. Der Sockel ist eckig, nicht rund.*

• Compare to:

  A: *Die Skulptur hat [einen Betonsockel].*

  B: *#Das stimmt nicht. Der Sockel ist eckig, nicht rund.*

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so as dimension shifter
projection behaviour

• With so, gesture material can be targeted by negation:

  \[\text{Ich würde mir niemals [SO eine Auflaufform] kaufen.}\]

  Lasagne sheets would not fit in properly.

• Compare to:

  \[\text{Ich würde mir niemals [eine Auflaufform] kaufen.}\]

  #Lasagne sheets would not fit in properly.
so as dimension shifter
target of question

- *so* makes the gesture material part of the question:

  A: *Hast Du [SO eine Auflaufform] gekauft?*

  B: *Nein, aber ich hab eine eckige gekauft.*

  B: *Ja, allerdings war sie eckig.*

- Compare to:

  A: *Hast Du gestern [eine Auflaufform] gekauft?*

  B: *Nein, aber ich hab eine eckige gekauft.*

  B: *Ja, allerdings war sie eckig.*
With pointing gestures

- Indefinite with pointing gesture (to casserole in shop window):

  A: Hast Du gestern [eine Auflaufform] gekauft?

  ![Pointing gesture]

  B: Nein, aber ich hab eine eckig/weiße gekauft.

  B: Ja, allerdings war sie eckig/weiß.

- Indefinite with pointing gesture (to c. in s.) and demonstrative:

  A: Hast Du [SO eine Auflaufform] gekauft?

  ![Pointing gesture]

  B: Nein, aber ich hab eine eckige/weiße gekauft.

  B: Ja, allerdings war sie eckig/weiß.
• Indefinite with pointing gesture (to casserole in shop window):

  A: *Peter hat sich gestern [eine Auflaufform] gekauft.*

  B: #*Nein, das stimmt nicht. Sie war weiß und eckig.*

  B': *Nein, das stimmt nicht. Er hat sich einen Topf gekauft.*

• Indefinite with pointing gesture (to c. in s.) and demonstrative:

  A: *Peter hat sich gestern [SO eine Auflaufform] gekauft.*

  B: *Nein, das stimmt nicht. Sie war weiß und eckig.*

  B': *Nein, das stimmt nicht. Er hat sich einen Topf gekauft.*
The role of *dies-*

- Gestures with definites:
  
  A: *Hast du [unsere Auflaufform] weggeschmissen?*
  
  B: #{Nein, aber die eckige} denn sie war ja eckig.

  B: *Ja, wobei sie ja etwas anders aussah.*

- Gestures with demonstrative *dies-*:
  
  A: *Hast du [DIESE Auflaufform] weggeschmissen?*
  
  B: *Nein, aber die eckige.*

  B: #{Ja, wobei sie ja etwas anders aussah.*
With pointing gestures

- **Definite with pointing gesture (to a picture in a catalogue):**
  
  A: *Hast du [unsere Auflaufform] weggeschmitten?*

  ![Pointing gesture]

  B: #*Nein, die nicht, aber die eckige/so sah sie ja nicht aus.*

  B: *Ja, allerdings war es ja eine ganz andere.*

- **Definite with pointing gesture (to pic in c.) and demonstrative:**
  
  A: *Hast Du [DIESE Auflaufform] weggeschmitten?*

  ![Pointing gesture]

  B: *Nein, aber die eckige.*

  B: #*Ja, allerdings war es ja eine ganz andere/sah sie ja ganz anders aus.*
✓Aim C

• Reasonable to assume that demonstratives act as 'dimension shifters'
Some notes on gestures

Gestures as non-at-issue material (A)

Source of non-at-issueness (B)

The role of demonstratives (C)

Towards a formal analysis (D)
Meaning construction for gesture and speech

- What is the meaning of a gesture (pointing and iconic)?
- What are the constructional rules, i.e. how does the synchrony of gesture and speech influence the interpretation?

Towards a formal analysis

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Denotation of gestures

- Assumption: iconic and pointing gestures function alike

- Note: for pointing deferred reference is possible (Nunberg 1993)

- For iconic gestures: represented individual is abstract and carries at least those features that are crucial for the comparison of this referent with the referent introduced in the verbal signal

- Only individuals can be pointed at/represented (and possibly events), but not properties (cf. Umbach & Gust to appear)

- Gestures denote rigid designators
Towards a formal analysis

Relation of gesture and coverbal referent

- Pointing or making an iconic gesture does not make a difference
- However, it makes a difference whether the respective gesture associates with an indefinite or a definite or with an NP only
- Claim: gesture relates to intended referent in different ways

**Indefinite: similarity** \(\text{(cf. Umbach & Gust to appear for so)}\)

**Definite: identity**

**NP: exemplification**
Relation of gesture and coverbal referent

• Fricke 2012, pp. 230ff: object vs. interpreter related gestures (objektbezogene- vs. interpretantenbezogene Gesten)

• Object-related gestures: gestures that relate to an intended referent (cf. example of the base made of concrete)

• Interpreter-related gestures: gestures that relate to a certain concept (or prototypical properties) of the noun phrase denotation

Then you pass through a [barn door]. [+ oval gesture]

• Could indicate that the speaker's prototypical concept of a barn door is that of an oval door. (Actual door could not be oval. Can lead to misinterpretations, see Fricke 2012)
Towards a formal analysis

Relation of gesture and coverbal referent

- Claim: this is actually an ambiguity of whether gesture associates with NP or entire DP
- Gesture with NP: gesture referent exemplifies/is an NP
- Gesture with DP: gesture referent stands in a certain relation to referent introduced in speech (similarity or identity)
- Prediction: only referential DPs (definites, specific indefinites) with accompanying gesture are ambiguous, not genuine quantifiers

\[ \text{Ich hab mir gestern [}_A \text{ eine [}_B \text{ Auflaufform }_B^A \text{] gekauft.} \]

\[ \text{[Wenige Auflaufformen] sind grün.} \]

A: The casserole I bought is (btw) as shown
B: My prototype of a casserole is as shown

Only: My prototype of a casserole is as shown
Not: The few casseroles that are green are (btw) as shown

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Reinterpretation of phenomenon

- Further prediction: gesture representing an atypical property ok with referential DPs, not with genuine quantifiers

(+Ziczac-g)

#Fast alle [Auflaufformen] in unserer Ferienwohnung waren total unpraktisch.
(+Ziczac-g)

- Research question: Is there an empirical reflex of what the gesture associates with, i.e. concerning the exact alignment of gesture and speech (onset or offset of gesture phrase, stroke, etc.)? (cf. Loehr 2004; Ebert, Evert, & Wilmes 2010, among others)
Towards a formal analysis

Relation of gesture and coverbal referent

- **Indefinites: similarity** (see Umbach & Gust 2013 for *so*)

  - at issue: sp bought a casserole yesterday
  - not at issue:
    - the casserole is similar to the intended referent with respect to shape;
    - the referent exemplifies a casserole (cf. Fricke 2007, Lücking 2013)

  - at issue: sp bought a casserole yesterday
  - which is similar to the intended referent with respect to shape
  - not at issue (this intonation): the referent exemplifies a casserole

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Relation of gesture and coverbal referent

- **Definites: identity**
  (not necessarily with index, but with referent; see Nunberg 1993)

  \[\text{Peter hat [unsere Auflaußform] fotografiert.}\]

  **at issue:** Peter took a picture of our casserole
  **not at issue:**
  the casserole is identical with the intended referent;
  the referent exemplifies a casserole

  \[\text{Peter hat [DIESE Auflaußform] fotografiert.}\]

  **at issue:** Peter took a picture of our casserole
  which is identical with the intended referent
  **not at issue:** the referent exemplifies a casserole
Towards a formal analysis

Formal modeling: example
based on AnderBois et al.'s (to appear) model for appositives

Ich sehe [eine Straße] (I see a street)

\[ x \land x = \text{speaker} \land [y] \land \text{street}_p(y) \land \text{see}_p(x, y) \land [z] \land z = \hat{g} \land \text{SIM}_{p_{cs}}(y, z) \land \text{street}_{p_{cs}}(z) \]
Conclusion

A: The gestures investigated contribute their material non-at-issue

B: What is responsible for the non-at-issue status of the gestures is not settled yet
    Likely candidates: speech-accompanying function, iconicity
    Pointing and iconic gestures serve the same aim and can be used interchangeably

C: Demonstratives like so and dies- act as dimension shifters
   (from non-at-issue to at-issue)

D: Gestures are rigid designators
   If accompanying NPs, they exemplify the NP-predicate
   If accompanying a referential DP, they establish a relation to the referent introduced in speech:
      with indefinites it is similarity; with definites, it is identity
Thank you!

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Cornelia Ebert
Appendix
Towards a formal analysis
joint work with Christian Ebert
Towards a formal analysis

Gesture meaning:
direct reference to intended referent \( g \):

\[
\left[ \begin{array}{c}
\text{ Gesture }\\
\end{array} \right] \rightarrow \lambda w. g
\]

In formulas, we use the formal language expression \( \lambda w. g \) to stand for this individual concept (i.e. the rigid designator)

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Towards a formal analysis

Make use of AnderBois, Brasoveanu & Henderson's (to appear) system to account for at-issue/non-at-issue distinction

uni-dimensional and dynamic

→ accounts for anaphora/binding between meaning levels

*Mary, who had been called by* John, *met HIM later.*

*Mary called John, who met HER later.*
Towards a formal analysis

Keep track of at-issue/non-at-issue content via propositional variables:

- non-at-issue **impositions** are evaluated w.r.t. the context set: $p^{cs}$
- at-issue **proposals** are evaluated w.r.t. an at-issue proposition: $p \subseteq p^{cs}$

Introduction of discourse referents: $[x], [p], \ldots$

Example: *Mary, who had been called by John, met HIM later.*

$[x] \land x = \text{mary} \land [y] \land y = \text{john} \land \text{call}_{p^{cs}}(y, x) \land \text{meet}_p(x, y)$

**Non-at-issue imposition on context set:** $\text{call}_{p^{cs}}(y, x)$

**At-issue proposal to add to context set:** $\text{meet}_p(x, y)$

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Important for later:
 discourse referents stand for individual concepts

For instance:

$$\left[ \text{meet}_p(x, y) \right]^{\langle g, h \rangle} = 1 \iff \forall w \in h(p) : \langle h(x)(w), h(y)(w) \rangle \in J_w(\text{meet})$$

In AnderBois et. al. 's system: equality of discourse referents means equality of concepts (w.r.t. all worlds)

$$\left[ x = y \right]^{\langle g, h \rangle} = 1 \iff g = h \text{ and } h(x) = h(y)$$

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Gesture meaning:

Composition of meaning contributions of speech and coverbal gesture:

indefinite article + gesture       definite article + gesture       noun + gesture

eine

\[ [x] \text{ similarity} \]

\[ \text{SIM}_{p^{cs}}(x, z) \]

die

\[ [x] \text{ identity} \]

\[ x = z \] (+ presuppositions)

\[ \text{Auflaufform} \]

casserole_{p}(x)

\[ \text{exemplification} \]

casserole_{p^{cs}}(z)

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eine Auflaufform

\[ x \]
casserole_p(x)

SIM_p^{cs}(x, z)  similarity  exemplification  casserole_p^{cs}(z)

\[ z \wedge z = \rightarrow g^{-} \]

\[ x \wedge [z] \wedge z = \rightarrow g^{-} \wedge SIM_p^{cs}(x, z) \wedge casserole_p(x) \wedge casserole_p^{cs}(z) \]
Towards a formal analysis


\[ [x] \land [z] \land z = \Gamma \rightarrow g \uparrow \land \text{SIM}_{p}\text{cs}(x, z) \land \\
\text{casserole}_{p}(x) \land \text{casserole}_{p}\text{cs}(z) \land \text{buy}_{p}(\text{speaker}, x) \]

Non-at-issue impositions on context set (AnderBois et. al., to appear; Farkas & Bruce, 2010):

- \text{SIM}_{p}\text{cs}(x, z)
- \text{casserole}_{p}\text{cs}(z)

At-issue proposal to add to context set:

\text{casserole}_{p}(x) \land \text{buy}_{p}(\text{speaker}, x)
Towards a formal analysis

so as a dimension shifter:

\[
\text{SIM}_{p_{cs}}(x, z) \quad \rightarrow \quad \text{SIM}_{p}(x, z)
\]
Towards a formal analysis

so eine Auflauﬀform

\[ [x] \quad \text{casserole}_p(x) \]

\[ \text{SIM}_p(x, z) \quad \text{similarity} \quad \text{exemplification} \quad \text{casserole}_{p^{cs}}(z) \]

\[ [z] \land z \Rightarrow g^\perp \]

\[ [x] \land [z] \land z \Rightarrow g^\perp \land \text{SIM}_p(x, z) \land \text{casserole}_p(x) \land \text{casserole}_{p^{cs}}(z) \]

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Speaker S: "Ich habe mir [so eine Auflaufform] gekauft."

$[x] \land [z] \land z \Rightarrow g^{-1} \land \text{SIM}_p(x, z) \land \text{casserole}_p(x) \land \text{casserole}_{pcs}(z) \land \text{buy}_p(\text{speaker}, x)$

**Non-at-issue imposition on context set:**

\[ \text{casserole}_{pcs}(z) \]

**At-issue proposal to add to context set** (cf. Umbach & Gust to appear):

\[ \text{SIM}_p(x, z) \land \text{casserole}_p(x) \land \text{buy}_p(\text{speaker}, x) \]
Towards a formal analysis

die Auflaufform

\[ [x] \quad \text{casserole}_p(x) \]

\[ x = z \quad \text{identity} \quad [z] \quad \text{exemplification} \quad \text{casserole}_p cs(z) \]

\[ [z] \land z \rightarrow \mathbf{g} \]

+ presuppositions (uniqueness/existence)

\[ [x] \land [z] \land z \rightarrow \mathbf{g} \land x = z \land \text{casserole}_p(x) \land \text{casserole}_p cs(z) \]
Towards a formal analysis

Speaker S: ("Maria hat hier diverse Küchenutensilien zurecht gelegt.")

"Peter hat [die Auflaufform] fotografiert."

\[ [x] \land [z] \land z \rightarrow g^\perp \land x = z \land \]
\[ \text{casserole}_p(x) \land \text{casserole}_{p\text{cs}}(z) \land \text{photograph}_p(peter, x) \]

Non-at-issue imposition on context set: \( \text{casserole}_{p\text{cs}}(z) \)
\( x = z \)

At-issue proposal to add to context set: \( \text{casserole}_p(x) \land \text{photograph}_p(peter, x) \)

+ presuppositions (uniqueness/existence)

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\textit{dies-} as a dimension shifter:

\[\text{die} \quad [x] \quad \text{identity} \quad x = z\]

\[\text{diese} \quad [x] \quad \text{identity} \quad x = z\]

difference can't be expressed in the formal system

roughly: \textit{diese} = \textit{so} + \textit{die}

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Speaker S:  "Peter hat [diese Auflaufform] fotografiert."

\[
[x] \land [z] \land z = \left[ \rightarrow g \right] \land x = z \land \text{casserole}_p(x) \land \text{casserole}_{p_{cs}}(z) \land \text{photograph}_p(peter, x)
\]

**Non-at-issue imposition on context set:** \( \text{casserole}_{p_{cs}}(z) \)

**At-issue proposal to add to context set:**

\[
x = z \land \text{casserole}_p(x) \land \text{photograph}_p(peter, x)
\]

(no presuppositions)
Discussion

The identity requirement \( x = z \) expresses identity of individual concepts,

i.e.  \( h(x) = h(z) = \rightarrow g \)

This derives Kaplan's (1989) crucial observation for \textit{dthat}:

\textit{diese Ausdrucksform} is \textbf{directly referential}
Discussion

Identity of concepts \( x = z \) is part of at-issue proposition only with the demonstrative:


B: *Stimmt nicht. Das Objekt, auf das du zeigst, hat er nicht fotografiert.*

- A: *Peter hat [die Auflaufform von Maria] fotografiert.*

B: #*Stimmt nicht. Das Objekt, auf das du zeigst, hat er nicht fotografiert.*

B: *Stimmt. Aber das ist nicht die Auflaufform von Maria.*

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Quantificational readings of definites are not possible/degraded with accompanying gesture:

A:  Es ist möglich, dass der Präsident der USA nicht Barack Obama ist.

A': #Es ist möglich, dass [der Präsident der USA] nicht Barack Obama ist.

Non-at-issue identity statement  \( x = z \) makes the definite directly referential/a rigid designator. Likewise:

B:  Der Präsident von Amerika war immer ein Mann.

B': #[Der Präsident von Amerika] war immer ein Mann.

Possibly, there is a resolution strategy to ignore the non-at-issue contribution
Discussion

**Mistaken identity** cases and the referential/attributive (speaker's/semantic reference) distinction

(Donellan 1966, Kripke 1977)

A: [Her husband] is kind to her.

B: No, be [= her actual husband] isn't.  
   *The man you are referring to isn't her husband.*  
   (Kripke 1977, p. 90)

**Attributive** ('standard') interpretation:

At-issue proposal:  

\[ \text{husband\_of}_p(x, y) \land \text{kind}_p(x, y) \]

Non-at-issue imposition:  

\[ x = z \land \text{husband\_of}_{pcs}(z, y) \]
A: [Her husband] is kind to her.

B: Yes, he [= the man referred to by the speaker via gesture] is kind to her.

But he isn't her husband. (Kripke 1977, p. 90)

Referential interpretation:

At-issue proposal:  \( \text{husband}_p(x, y) \land \text{kind}_p(z, y) \)

Non-at-issue imposition:  \( x = z \land \text{husband}_p(z, y) \)

semantic vs. speaker's referent  \( \leftrightarrow \) at-issue reference via speech vs. gesture
Discussion

Possibly carries over to **referential uses of definites** (and specific indefinites) in general

**Attributive** ('standard') interpretation:

*A: What does your husband do?*

At-issue proposal:  \( \text{husband}_{p}(x, \text{speaker}) \land \text{linguist}_{p}(x) \)

Non-at-issue imposition:  \( x = z \land \text{husband}_{p^{cs}}(z, \text{speaker}) \)

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Discussion

Referential interpretation:

**A:** What does the guy over there do?

- The guy over there is a linguist
- My husband is a linguist

At-issue proposal:  \( \text{husband}_p(x, \text{speaker}) \land \text{linguist}_p(z) \)

Non-at-issue imposition:  \( x = z \land \text{husband}_p(z, \text{speaker}) \)

Reference to same object via different concepts
(future work: compare to Aloni, 2001)

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References

- AnderBois, S., A. Brasoveanu & R. Henderson (t.a.): At-issue proposals and appositive impositions in discourse. *Journal of Semantics*.
References


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