

Gestures, appositives and truth value judgements – an experimental series

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Gesture Traditions

- Gestures have a long tradition in neurosciences, evolution theory, communication theory, semiotics, robotics, and in particular psychology
- But – except for pointing gestures – they are generally ignored in (formal) semantics or pragmatics
(recent exceptions: Lascarides & Stone 2009; Giorgolo 2012)

Gestures

- Gesture:
communicative movements of hands and arms
transporting emotions, intentions, and thoughts
- Types of Gestures:
 - Iconic gestures
 - Pointing gestures
 - Emblematic gestures
 - Metaphoric gestures
 - Regulators
 - Beats

A Corpus Example

- Speech-accompanying iconic gesture
- From the Bielefeld Speech-and-Gesture-Alignment (SaGA) corpus of project B1 *Speech-gesture-alignment* of the SFB 673 *Alignment in Communication* (Lücking et. al 2013)

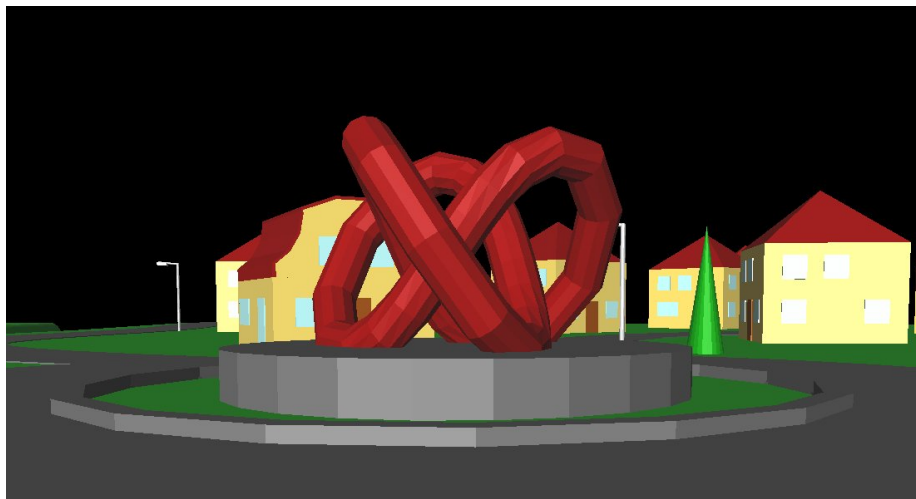
A Corpus Example



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}.

Semantic Contribution

- Gesture information adds semantic content to the utterance
- Here: information about the shape of the base and the arrangement of the tubes



Main Claim

- When accompanying speech, gesture contribution is **not at issue** by nature
- Gesture contribution is not what the speaker intends to push conversation to
- Unless gestures...
 - stand alone (without co-occurring speech), or
 - accompany demonstratives

Research Questions

- Question for this talk:

How does gesture meaning combine with verbal meaning?

→ claim: co-speech gestures are non-at-issue by default

- Recent research (Ebert 2014) (not in this talk):

What exactly is the (formal-semantic) meaning contribution of the gesture?

→ claims: - (iconic and pointing) gestures denote (rigid designators to) the gesture referent

- there are additional meaning contributions due to alignment with verbal phrases

Experiments

- On gestures:
 - In what way do gestures contribute meaning?
 - result: they do not contribute to truth conditions in the same way as speech material (as they are not at-issue)
- On appositives:
 - Do they contribute in the same way as gestures?
 - result Exp. 1: no, they seem to contribute to truth conditions just like at-issue information; result in conflict with often made claims on appositives (but see Koev & Syrett 2014)
 - design Exp. 2: check whether results of Exp. 1 are due to experiment design

Main Claim

gestures systematically contribute non-at-issue meaning

Two Dimensions

- ‘Multidimensional meanings’: **at-issue** vs. **non-at-issue** material (e.g. Potts 2012)
- Words, phrases, and entire sentences contribute meanings in different ‘dimensions’ (cf. Grice 1975)
- **Formal frameworks:** Potts 2005, 2007; Gutzmann 2012; Koev 2013; AnderBois et al. t.a. among others

Two Dimensions within Speech

- Core phenomena:
 1. **expressives** like *damn* (or 'mixed items' like *cur*)
Ex.: The damn dog howled all night.
 2. **supplements** like appositive relative clauses or appositive NPs
Ex.: Paul, the best horse riding instructor in the world, moved to Stuttgart recently.
- 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
- Gestures naturally contribute information in a different 'dimension' (mode)

Expressives and Emblems

- Expressives ≈ (co-speech) emblematic gestures
- Transmit attitudes and feelings, often negative ones, 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'
- Recurring metaphor for gestures: a 'window to the mind'
(cf. the title of McNeill 2000, see also: McNeill 1992, 2005)

Supplements and Iconics

Appositives ≈ (co-speech) iconic gestures

(1) Cornelia: *"Ich habe [eine Flasche Wasser] zum Talk mitgebracht."* /
"I brought [a bottle of water] to the talk."



Conveys roughly the same meaning as:

(2) Cornelia: *"Ich habe eine große Flasche Wasser zum Talk mitgebracht."* /
"I brought a big bottle of water to the talk."

Gestures' Semantic Contribution

- Gesture information adds semantic content to the utterance (cf. McNeill 1992, Kendon 1980)
- Question:
 - **How** does gesture meaning combine with verbal meaning?

Gesture Meaning is Non-at-issue

- Gestures contribute **non-at-issue meaning** (in the sense of Potts 2005)
- Speech-accompanying (iconic and pointing) gestures roughly behave like appositives
- Appositives (cf. Potts 2005):
 - (3) *Ludger Beerbaum, an outstanding show jumper, was accused of poling.*
 - (4) *Ludger Beerbaum, who is an outstanding show jumper, was accused of poling.*

Tests for Non-at-issueness

- Appositives are argued to be non-at-issue (Potts 2005)
- Among other things, appositives have these properties:
 - they cannot be denied directly in discourse
 - they project, e.g. they cannot be the target of negation

Appositive Meaning is Non-at-issue

The direct denial test

protest to appositive

(5) *Ludger Beerbaum, an outstanding show jumper, was accused of poling.*

Direct denial response:

(6) *#That's not true! He is actually a lousy show jumper.*

Discourse interrupting protest:

(7) *Hey, wait a minute! Actually, he is not an outstanding show jumper, but pretty lousy.*

protest to main clause

(5) *Ludger Beerbaum, an outstanding show jumper, was accused of poling.*

Direct denial response:

(8) *That's not true! He was actually accused of doping.*

Appositive Meaning is Non-at-issue

The negation test

negating the appositive

- (9) *It is not true that Ludger Beerbaum, an outstanding show jumper, was accused of poling.*

Negation elaboration:

- (10) *#He is actually a lousy show jumper.*

negating the main clause

- (9) *It is not true that Ludger Beerbaum, an outstanding show jumper, was accused of poling.*

Negation elaboration:

- (11) *He was actually accused of doping.*

Gesture Meaning is Non-at-issue

The direct denial test

speech & gesture

(12) *I brought [a bottle of water].*



Direct denial response:

(13) *#That's not true! You actually brought a small bottle.*

Discourse interrupting protest:

(14) *Hey, wait a minute! Actually, the bottle is not as big.*

speech only

(15) *I brought a big bottle of water.*

Direct denial response:

(16) *That's not true! You actually brought a small bottle.*

Gesture Meaning is Non-at-issue

The negation test

speech & gesture

(17) *I did not bring [a bottle of water] to the talk.*



Negation elaboration:

(18) *#A small one is enough for me.*

speech only

(19) *I did not bring a big bottle of water to the talk.*

Negation elaboration:

(20) *A small one is enough for me.*

Gesture Meaning is Non-at-issue

- (1) *"Ich habe [eine Flasche Wasser] zum Talk mitgebracht." /*
"I brought [a bottle of water] to the talk."



How does gesture meaning combine with verbal meaning?

At-issue: semantic content of the speech signal

The speaker brought a bottle of water to the talk

Non-at-issue: 'semantic content' of the gesture (roughly):

The bottle is big

In parentheses

demonstratives are 'dimension shifters'

German so as Dimension Shifter

The negation test

speech & gesture

(B1) *Ich bringe niemals
[eine Flasche Wasser] mit zu
Vorträgen.*



*I never bring [a bottle of water]
to talks.*

Negation elaboration:

(B2) *#Eine kleine reicht mir nämlich.
(A small one is enough for me.)*

speech + so & gesture

(B3) *Ich bringe niemals
[SO eine Flasche Wasser] mit zu
Vorträgen.*



*I never bring [a bottle of water
like that] to talks.*

Negation elaboration:

(B4) *Eine kleine reicht mir nämlich.
(A small one is enough for me.)*

German so as Dimension Shifter

- What happened here?

(B5) *Ich bringe niemals [SO eine Flasche Wasser] mit zu Vorträgen.*
(I never bring [a bottle of water like that] to talks.)



is synonymous to

(B6) *Ich bringe niemals eine große Flasche Wasser mit zu Vorträgen.*
(I never bring a big bottle of water to talks.)

- so shifted gesture meaning contribution (i.e. similarity) from the non-at-issue level to the at-issue level

German so as Dimension Shifter

The direct denial test

speech & gesture

(B7) *Ich habe [eine Flasche Wasser] mitgebracht.*



I brought [a bottle of water].

Direct denial response:

(B8) *#Das stimmt nicht. Du hast doch eine kleine mitgebracht*
(That's not true! You actually brought a small bottle.)

speech + so & gesture

(B9) *Ich habe [SO eine Flasche Wasser] mitgebracht.*



I brought [a bottle of water like that].

Direct denial response:

(B10) *Das stimmt nicht. Du hast doch eine kleine mitgebracht.*
(That's not true! You actually brought a small bottle.)

Demonstratives as Dimension Shifters

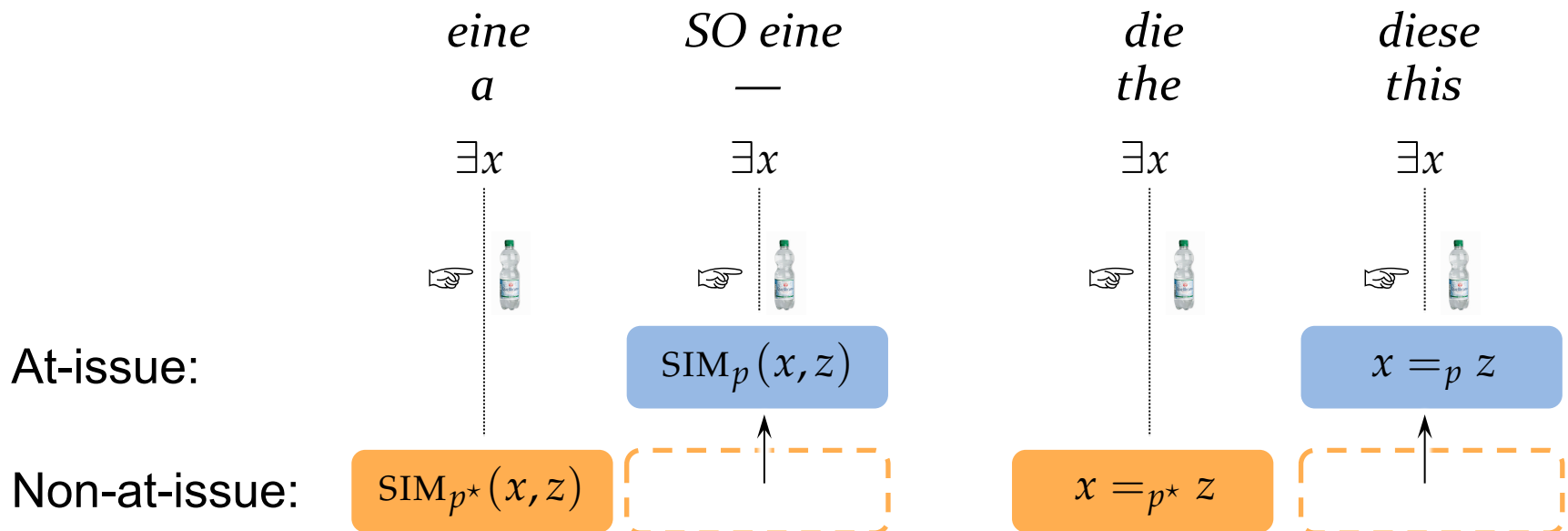
- Demonstratives make speech-accompanying gesture meaning **at-issue**
- Comes close to Tomasello's (1999) claim (in the spirit of Bühler 1934) that demonstratives are attention shifters and serve to create 'joint attention' (cf. Diessel 2006)
- Cf. Fricke 2012, Umbach & Ebert 2009, Streeck 2002 for placeholder-function of *so* (see also König 2012)
- Demonstratives function as **dimension shifters** from non-at-issue to at-issue (pace Potts 2005, 2007 and Gutzmann 2012)

Demonstratives as Dimension Shifters

- *diese/this* is the demonstrative version of the shifted definite article *die/the*, i.e.

diese = *so* + *die*

this = *so* + *the*

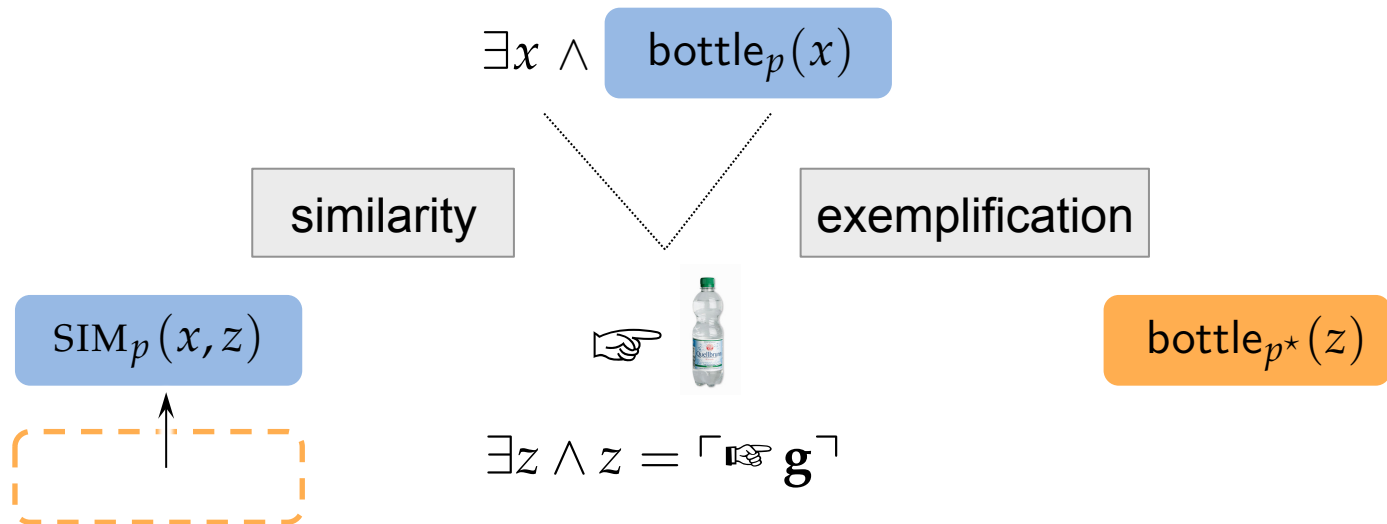


A Formal Example

(so + indefinite article)

Combined meaning contributions of speech and gesture:

SO eine Flasche



$$\exists z \wedge z = \ulcorner \text{hand icon } g \urcorner \wedge \exists x \wedge \text{bottle}_p(x) \wedge \text{SIM}_p(x, z) \wedge \text{bottle}_{p^*}(z)$$

(cf. Umbach & Gust to appear)

A Formal Example

(so + indefinite article)

(B11) *Cornelia hat [SO eine Flasche] mitgebracht.*
Cornelia brought [a bottle like that].



$$\exists z \wedge z = \ulcorner \text{☞ } \mathbf{g} \urcorner \wedge \exists x \wedge \text{bottle}_p(x) \wedge \text{SIM}_p(x, z) \wedge \text{bottle}_{p^*}(z) \wedge \text{bring}_p(\text{cornelia}, x)$$

At-issue:

there is a bottle **which is similar to the gesture referent** that Cornelia brought

Non-at-issue:

the gesture referent is itself a bottle

End of parentheses

demonstratives are 'dimension shifters'

Gesture Meaning is Non-at-issue

- Intermediate conclusion:
Gesture meaning is non-at-issue
- Predictions:
 - gesture meaning is processed like other non-at-issue material (e.g. appositives)
 - gesture meaning is not treated like asserted material and does not enter truth conditions straightforwardly (but see Syrett & Koev 2014 and their results for the truth-conditional contribution of appositives)
- Rating experiment to test for these predictions

Experiment on gestures

how do gestures contribute meaning?

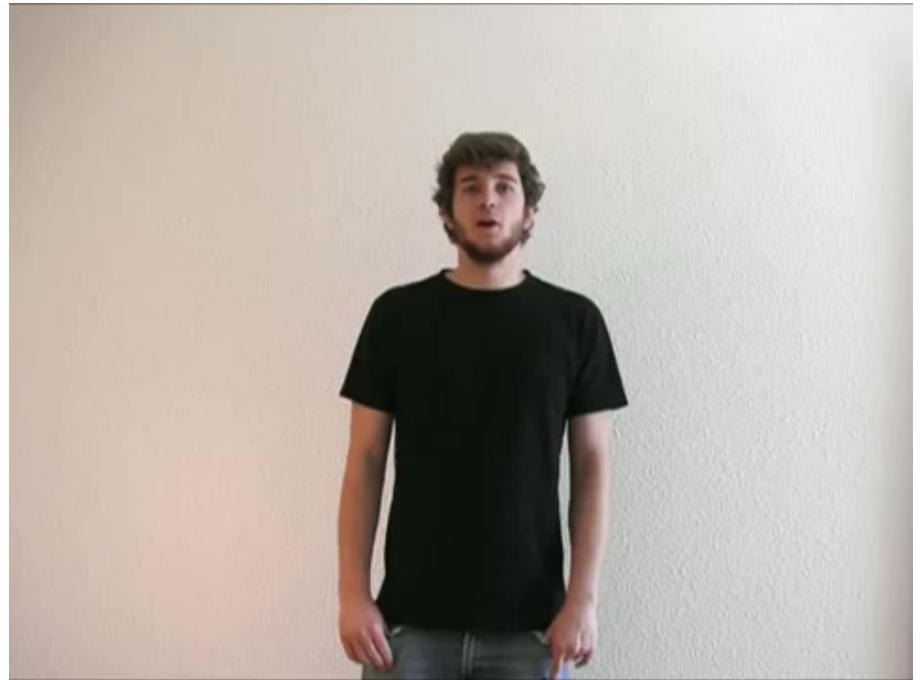
Gesture Meaning is Non-at-issue

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

①



②



③

*Auf diesem Bild ist eine Mauer mit [einem Fenster] zu sehen.
(In this picture, you see a wall with a window.)*

Does the description in the video fit the picture? ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

1 = not at all; 5 = perfectly

Gesture Meaning is Non-at-issue

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

Auf diesem Bild ist eine Mauer mit [einem Fenster] zu sehen...



Auf diesem Bild ist eine Mauer mit einem runden Fenster zu sehen...

gesture vs. adjective

match vs. mismatch

Gesture Meaning is Non-at-issue

Prestudy to decide on the gesture/adjective to be taken

- Pretest to test for the **typicality of the gestures for the NP concept**
- Worry: some gestures might be considered typical for the NP ('interpretantenbezogene Gesten' (*concept related gestures*), cf. Fricke 2012)
- Picture/gesture match might then be considered high, because gesture matches NP concept, not the concrete DP object
- Solution: choose gestures that are untypical for the NP concept

Gesture Meaning is Non-at-issue

- materials:

24 experimental items (48 fillers)

- independent variables:

MATCH: match vs. mismatch

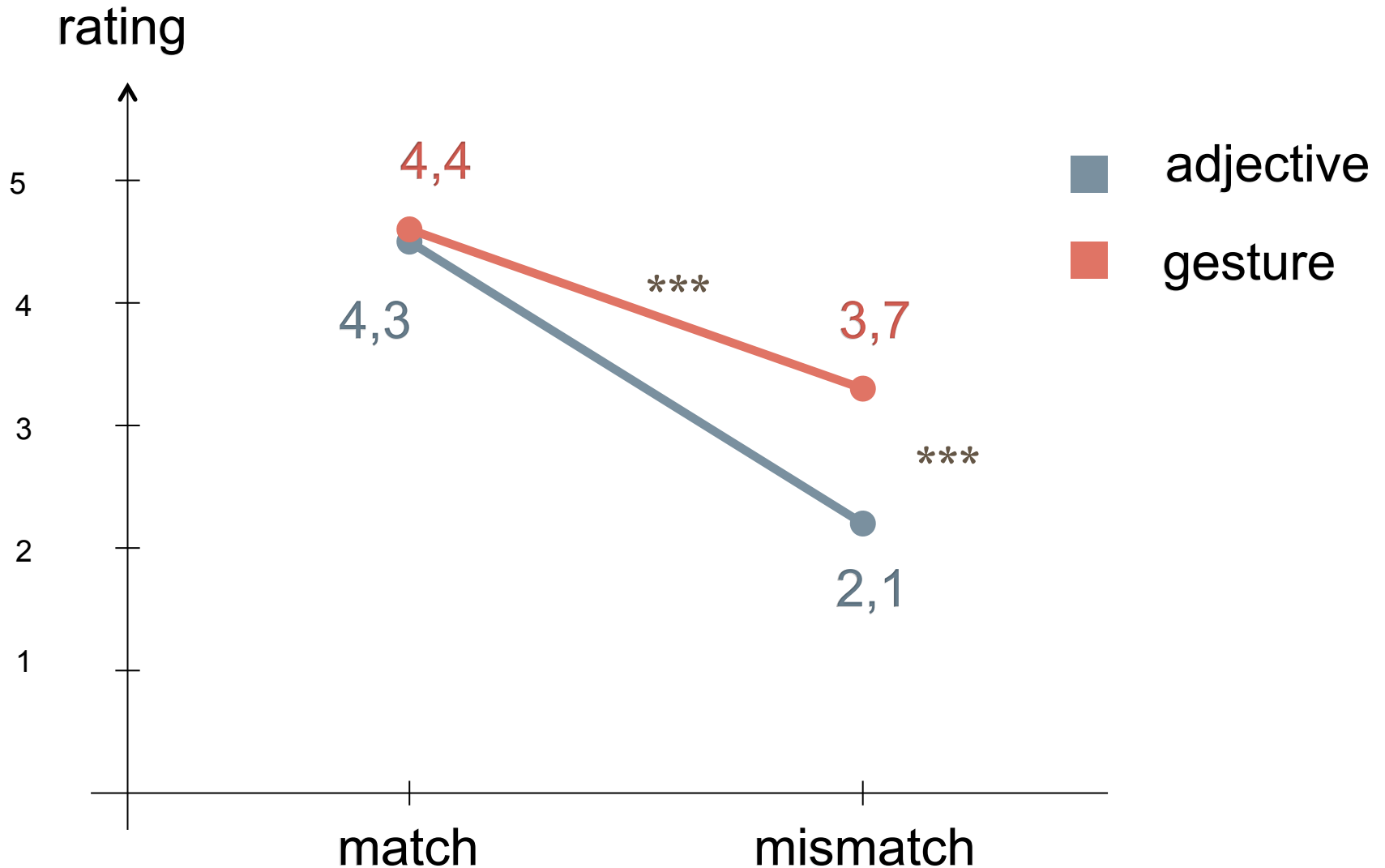
MODE: **gesture** vs. **adjective**

- participants:

40 students of the University of Stuttgart
native speakers of German

expectation: **gesture mismatch** >> **adjective mismatch**

Gesture Meaning is Non-at-issue



Gesture Meaning is Non-at-issue

- Predictions confirmed:
 - clear interaction effect: negative influence of mismatches much lower for gestures than for adjectives
 - gesture meaning does not enter truth conditions straightforwardly → not treated like asserted material
- Gesture meaning is non-at-issue
- Next experiment: run exact same experiment with appositives instead of gestures

Experiments on appositives

How do appositives contribute meaning?

Appositives are Non-at-issue?

Assumption:

Appositives are non-at-issue (following Potts 2005)

Rating study I & II:

influence of appositives on truth-value judgements:

Do they contribute meaning in a similar way as gestures do?

Recall that gesture meaning does not enter truth conditions straightforwardly → not treated like asserted material

Appositives are Non-at-issue?

Rating study I: influence of appositives on truth-value judgements

①



② *Auf diesem Bild sieht man einen Sockel, [pause] einen runden [pause], mit einer Statue darauf.
(In this picture, there is a statue standing on a base, [pause] a circular [pause] (one).)*

③ Does the description in the audio match the picture?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

1 = not at all

5 = perfectly

Appositives are Non-at-issue?

Rating study I: influence of appositives on truth-value judgements

Auf diesem Bild sieht man einen Sockel, [pause] einen runden [pause], mit einer Statue darauf.



Auf diesem Bild sieht man einen runden Sockel mit einer Statue darauf.

match

vs.

mismatch

appositive vs. adjective

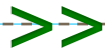
Appositives are Non-at-issue?

Rating study I: influence of appositives on truth-value judgements

Auf diesem Bild sieht man einen Sockel, [pause] einen runden [pause], mit einer Statue darauf.

Prediction / expectation:

appositive-picture mismatch rating



adjective-picture mismatch rating



Auf diesem Bild sieht man einen runden Sockel mit einer Statue darauf.

mismatch

appositive vs. adjective

Appositives are Non-at-issue?

Rating study I: influence of appositives on truth-value judgements

independent variables:

MATCH: match vs. mismatch (with pictures)

MODE: appositive vs. adjective (with audio records)

materials:

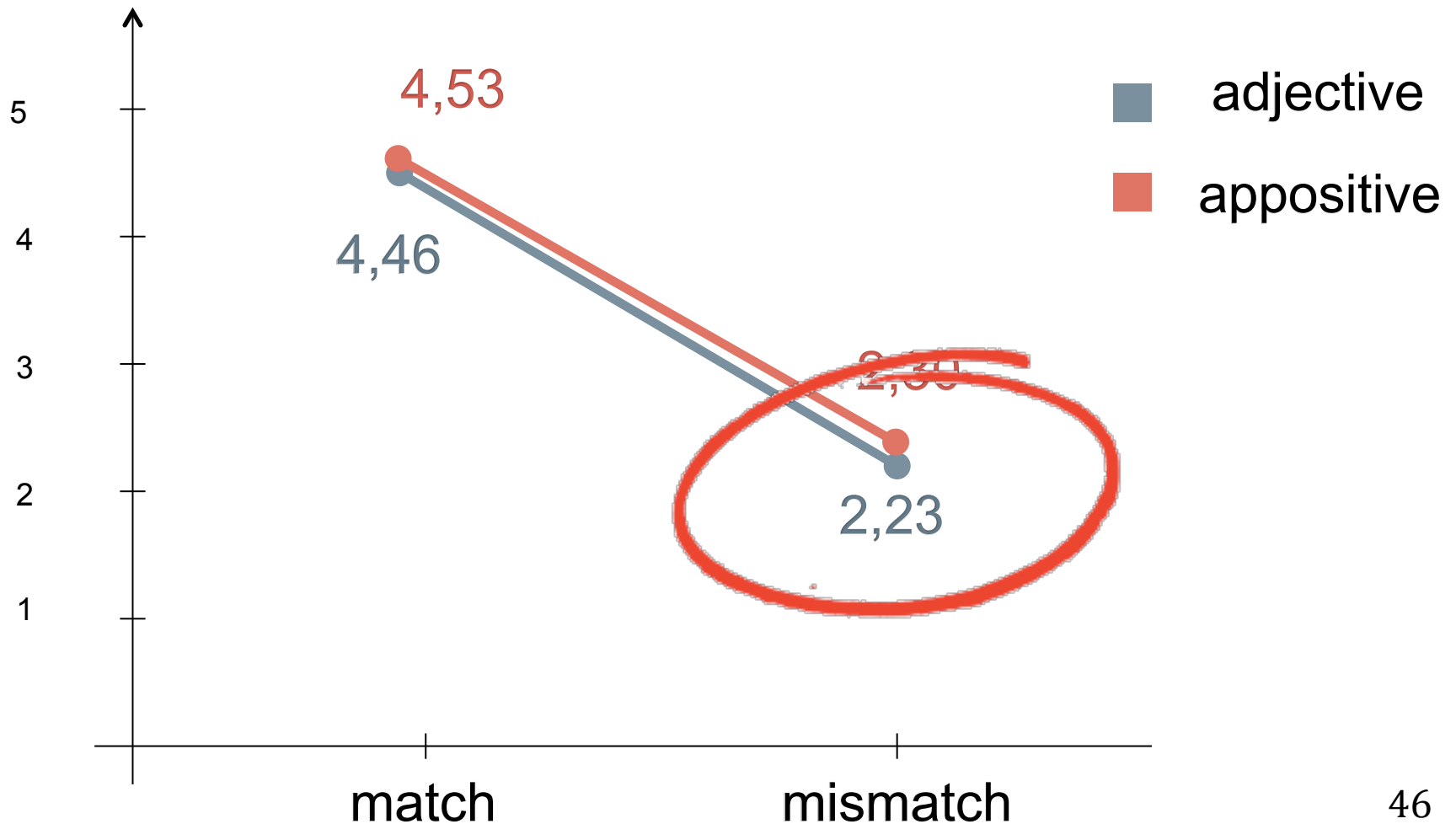
24 experiment items + 48 fillers

participants:

40 German native speakers
(students of the University of Stuttgart)

Appositives are Non-at-issue?

rating results



Appositives are Non-at-issue?

Prediction/expectation **unfulfilled**:

There was no difference between appositive-picture mismatch rating and adjective-picture mismatch rating

Conclusion:

Appositives seem to contribute to truth conditions the same way at-issue information does (in line with Koev & Syrett 2014)

Appositives differ from gestures in this respect

Appositives are Non-at-issue?

Discussion:

Too little information was provided

Consequently, participants' attention focused on every bit of it

There was no context to rely upon to tell 'secondary' information apart from at-issue information

Rating study II (ongoing):

redesign the previous study, providing sufficient context and clear cases of non-at-issueness of appositives

Appositives are Non-at-issue?

Rating study II (ongoing): influence of appositives on truth-value judgements

① Establishing the examiner – examinee setting:

During an interview, the examiner is asking the examinee to remember details about a picture showed to him a few weeks ago

**The uppermost
(and only) triangle is
green**



② Prüfer: *Erinnern Sie sich noch, was auf dem Bild war?*
(Examiner: *Do you still remember what was in that picture?*)

Appositives are Non-at-issue?

Rating study II (ongoing): influence of appositives on truth-value judgements

③ Case I: the color of the triangle is introduced as an appositive, i.e. non-at-issue content

Prüfling: *Bauklötze. Ein Dreieck, [pause] blau [pause], war ganz oben.*
(Examinee: Building blocks. A triangle, *[pause] blue [pause]*, was at the very top.)

mismatch



Case II: the color of the triangle is introduced as an adjective, integrated into the DP, i.e. at-issue content

Prüfling: *Bauklötze. Ein blaues Dreieck war ganz oben.*
(Examinee: Building blocks. A blue triangle was at the very top.)

Appositives are Non-at-issue?

Rating study II (ongoing): influence of appositives on truth-value judgements

- ④ Prüfer: Ja, genau, das stimmt. Da war ein Dreieck ganz oben.

(Examiner: *Yes, exactly, that's right. There was a triangle at the very top.*)

! exclusion the color from the truth condition

- ⑤ Ist die Reaktion des Prüfers der Situation sprachlich angemessen?
(Is the examiner's reaction linguistically appropriate to the situation?)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

1 = not at all

5 = perfectly

Appositives are Non-at-issue?

Rating study II (ongoing): influence of appositives on truth-value judgements

Prüfling: *Bauklötze. Ein Dreieck, [pause] blau [pause], war ganz oben.*



match

vs.



match

Prüfling: *Bauklötze. Ein blaues Dreieck war ganz oben.*

color not-at-issue
appositive vs. adjective
color at-issue

Appositives are Non-at-issue?

Rating study II (ongoing): influence of appositives on truth-value judgements

Prüfling: *Bauklötze. Ein Dreieck, [pause] blau [pause], war ganz oben.*

Prediction / expectation:

appositive-picture mismatch rating



adjective-picture mismatch rating



mismatch

Prüfling: *Bauklötze. Ein blaues Dreieck war ganz oben.*

color not-at-issue
appositive vs. adjective
color at-issue

Appositives are Non-at-issue?

Rating study II (ongoing): influence of appositives on truth-value judgements

independent variables:

MATCH: match vs. mismatch (with pictures)

MODE: appositive vs. adjective (with audio records)

materials:

24 experiment items + 48 fillers

participants:

40 German native speakers
(students of the University of Stuttgart)

Conclusion

- Gesture meaning:
is non-at-issue,
and does not enter truth conditions straightforwardly
- Appostive meaning:
despite being considered largely non-at-issue and often
argued not to contribute to truth conditions straightforwardly,
seem to contribute to truth conditions the same way at-issue
information does (rating study I),
which remains to be verified by further investigation
(rating study II)

Thank you

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Appendix E

rating study on gesture meaning contribution

Gesture Meaning is Non-at-issue

Prestudy to decide on the gesture/adjective to be taken

- Solution: choose gestures that are untypical for the NP concept
- Two groups of 15 native speakers each were played silent videos and asked to rate the typicality of the gestures for the corresponding NP
- E.g. Is the gesture typical for a window?
Scale: 1 (not typical at all) to 5 (very typical)
- Example: mean rating for '*window*':
square = 3,9
round = 1,3

Gesture Meaning is Non-at-issue

Fillers (48)

- A: 24 with gesture (polysems),
B: 24 without gesture
(background check)
- A: 12 gesture picture matches,
12 gesture picture mismatches;
- Example A (match):

Auf diesem Bild ist eine Fliege zu sehen.

*'In this picture you can see a fly/
bow tie.'*



Gesture Meaning is Non-at-issue

Fillers (48)

- B: 12 speech picture match, 12 speech picture mismatches
- Examples B (mismatch):

Auf diesem Bild sind im Hintergrund Wolken zu sehen.

'In this picture you can see clouds in the background.'



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