Topic Shift Potential of German Demonstrative Pronouns

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Introduction
Two attention-related discourse functions of (German) demonstrative pronouns (for evidence of demonstratives as attention orienting devices from typology see Diessel 1999, Schapper & San Roque 2011, Evans et al. 2018)

- backward function
- forward function

Research goal:

- compare processing of two different types of German demonstrative pronouns (*der* vs. *dieser*) regarding (backward and) forward function
Der Fußballspieler hat den Tennisspieler getroffen. Er war groß.
‘The soccer player met the tennis player. He was tall.’

In German, in addition to personal pronouns there are demonstrative pronouns (heDEM) that can be used as anaphoric devices to refer back to animate characters:

Der Fußballspieler hat den Tennisspieler getroffen. Der war groß.
Der Fußballspieler hat den Tennisspieler getroffen. Dieser war groß.
The soccer player met the tennis player. HeDEM was tall.
‘The soccer player met the tennis player. He was tall.’
(Demonstrative) Pronouns from a cognitive perspective:
connection between referential form (e.g. personal or demonstrative pronoun) and
cognitive status of referents in mental representation (e.g. Ariel 1990, Gundel et al. 1993)

Definite NPs
‘The soccer player’

Demonstrative Pronouns
‘This’

Personal Pronouns
‘He’

Prominent Referent

(adapted from Ahrenholz 2007: 242, Ellert 2011: 27)
Different preferences related to prominence status of referents:

• personal pronoun \(\rightarrow\) prominent referent / center of attention
• demonstrative pronouns \(\rightarrow\) avoid current center of attention (cf. Comrie 1997) / select less prominent (but still activated) referent
Which factors can contribute to a referent’s prominence status?

• being agent (Schumacher et al. 2016)
• being subject (Gordon et al. 1993, Bosch et al. 2007, Kaiser & Trueswell 2004)
• being topic (Bosch & Umbach 2007)
• being mentioned first (Gernsbacher 1990)
• etc. (Arnold 2010)

The soccer player met the tennis player. He ... 
The soccer player met the tennis player. HeDEM ‘this’ ...
German has two types of demonstratives (*der* vs. *dieser*) / difference unclear

- demonstrative I *der* → behaves complementary to personal pronoun /relies on computation of prominence hierarchies
- demonstrative II *dieser* → ??? *(last-mentioned preference* suggested by Zifonun et al. 1997; would support other form-specific accounts, see e.g. Kaiser & Trueswell 2008 regarding the Finnish demonstrative pronoun)
Function of (demonstrative) pronouns within larger text segments:

The soccer player met the tennis player. He DEM...

- choice of particular pronoun (e.g. personal or demonstrative pronoun) indicates to addressee whether current discourse topic will be maintained or changed / this way, pronoun guides discourse comprehension

(= forward-looking function of pronouns)
Literature overview on forward function of German demonstratives:

- Abraham (2002):
  personal pronoun $\rightarrow$ “keeps” current/old discourse topic (‘what the text is about’)
  demonstrative pronoun $\rightarrow$ initiates topic shift, interrupts topic continuity ("topic shifter")

- Weinrich (1993):
  demonstrative article / pronoun $\rightarrow$ “attention signal for a conspicuous reference” which indicates interruption of referential chain
Empirical evidence (Schumacher et al. 2015) from text continuation task (method based on Gernsbacher & Shroyer 1989):

Der Feuerwehrmann möchte den Jungen retten, weil das Haus brennt. Aber er ist …
‘The firefighter wants to rescue the boy, because the house is burning. But he is …’

… unfähig dem Jungen zu helfen, weil er noch auf seine Kollegen warten muss. …
‘… unable to help the boy because he has to wait for his colleagues. …’
Empirical evidence (Schumacher et al. 2015) from text continuation task:

Der Feuerwehrmann möchte den Jungen retten, weil das Haus brennt. Aber der ist …
‘The firefighter wants to rescue the boy, because the house is burning. But he is …’

… nicht bereit, sich aus dem Haus führen zu lassen, weil seine Katze noch drin ist. Er liebt Tiere so sehr. …
‘… reluctant to be escorted out of the burning house because his cat is still in there. He loves animals so much. …’
• empirical evidence that demonstrative I *der* is understood as instruction to change the topic (Schumacher et al. 2015)

• **German has two types of demonstratives (*der* vs. *dieser*) / difference unclear:**
  - almost no accounts in literature regarding which demonstrative might have stronger topic shift potential (cf. Ahrenholz 2007):
    - one demonstrative pronoun might change topic only temporarily, while other demonstrative pronoun might change topic in the long run
Two discourse functions of German demonstrative pronouns:
• backward function (demonstratives avoid prominent referent)
• forward function (demonstratives indicate topic shift)

Two German demonstrative pronouns / difference unclear:
• der vs. dieser

Research goal:
• compare processing of the two demonstrative pronouns regarding (backward and) forward function in two related experiments
**Experiment I (EEG): Background**

- **Electroencephalography (EEG):** brain’s electrical activity is measured along the scalp (→ information about language processing with high temporal resolution)

- **Event-related potentials (ERPs):** brain’s response to a particular stimulus / ERPs are time-locked to a particular stimulus

(left photo: http://xlinc.phil-fak.uni-koeln.de/22040.html; right photo: https://www.idea-frankfurt.eu/de/labore/f-eeg)
Experiment I (EEG): Background

- **polarity**: negative vs. positive deflections (negativity plotted upwards)

- **vertical axis**: illustrates size of amplitude (in microvolt)

- **horizontal axis**: illustrates onset of critical stimulus (e.g. pronoun) and time course

- **relative measurement**: critical condition vs. control condition
ERP components ("deflections") related to the processing of referents:

1. N400 = expectation based processing (important for backward function)

2. Late Positivity: discourse updating (important for forward function)
Our expectations regarding forward function:

• Late Positivity has been elicited by signals that change discourse and require updating of our mental representation of the discourse, e.g. new information or topic shift
• Late Positivity = reflection of mental model updating costs
  (cf. Burkhardt 2006, 2007; Schumacher & Hung 2012; Schumacher et al. 2015)

• forward function: demonstrative pronouns indicate a topic shift (= updating of our mental representation of discourse is required; new topic has to be incorporated)
  ➢ we expect higher Late Positivity for demonstrative pronouns compared to personal pronoun
Schumacher et al. (2015):

- compared processing of personal pronoun *er* and one type of demonstrative pronoun *der*

- higher costs for demonstrative regarding backward function (N400) and forward function (Late Positivity)
Our more fine-grained expectations regarding forward function of *der* vs. *dieser*:

- we expect higher Late Positivity for demonstrative with higher topic shift potential
Active accusative verbs (subject/agent before object/patient):

Im Restaurant hat der Fussballspieler den Tennisspieler getroffen.
In the restaurant has the soccer player the tennis player met.
‘In the restaurant the soccer player met the tennis player.’

Dort hat er/der/dieser wie immer ein Steak bestellt.
There has he PERS.PRO/ he DEM I/ he DEM II as usual ordered a steak.
‘There he ordered a steak as usual.’
In the restaurant, the soccer player met the tennis player.

There he_PERS/he_DEM I/he_DEM II...
Two types of German demonstratives that indicate topic shift (= require discourse updating)

• we found a higher Late Positivity for demonstrative pronoun II *dieser*

➢ Late Positivity is reflection of mental model updating costs = *dieser* has strongest effect on discourse / strongest potential to shift attention (in our context)
Active accusative verbs (subject/agent before object/patient); method based on Shroyer & Gernsbacher (1989):

Im Restaurant hat der Fussballspieler den Tennisspieler getroffen.
In the restaurant has the soccer player the tennis player met.
‘In the restaurant, the soccer player met the tennis player.’

Dort hat er/der/dieser wie immer ....
There has he/PERS/PRO/he/DEMP/DEMII/he/DEMI as usual ...
Every morning, the male nurse combed the resident. During this process, he ... often fell asleep.
The resident could always relax during this routine in the morning, because the male nurse was very close to him. A deep relationship had developed between the resident and the male nurse.
The resident told the nurse about his experiences during the war and how he met his wife in a hospital ward. They were separated at first, because he had to go back to war. Luckily ...
Topic Shift Potential of German Personal and Demonstrative Pronouns

References to Referent 2 (in %)
Experiment II (Text Continuation): Results

• **personal pronoun *er*: ambiguous, not only used for topic maintenance (at least in our context)

• **demonstrative pronoun I *der*: topic shift potential is strongest initially, but gets weaker over time (= *parenthetical function*), not a good permanent topic shifter (at least in our context)

• **demonstrative pronoun II *dieser*: strongest topic shift potential in the long run, potential to change discourse structure permanently (at least in our context)
Conclusion: Topic Shift Potential of German Demonstratives

- **EEG:** demonstrative pronoun II *dieser* required highest amount of discourse updating (reflected in higher Late Positivity compared to other demonstrative pronoun)

- **Text continuation:** demonstrative pronoun II *dieser* showed strongest potential to shift topic in the long run (in our context; preliminary results)
  
  - Demonstrative pronoun I *der*: does not seem to be a good (discourse) topic shifter
  
  - Demonstrative Pronoun II *dieser*: seems to be important discourse structuring device / good permanent topic shifter
Neural Correlates of Attentional (Re-)Orientation

Thank you for your attention!

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