

## Do German demonstrative pronouns avoid prominent perspectival centers?

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German demonstrative pronouns of the *der/die/das*-paradigm (DPros) are known to avoid prominent discourse referents as antecedents or binders. Prominence is usually defined in terms of the notions subjecthood, topicality, and agentivity (see Bosch et al., 2007; Hinterwimmer, 2015; Schumacher et al., 2016). Recently, Hinterwimmer and Bosch (2016) (HB) argued that individuals functioning as *perspectival centers* are also prominent and thus avoided by DPros, where they define perspectival centers as follows: An individual  $x$  is the perspectival center with respect to a proposition  $p$  if  $p$  expresses the content of an utterance or thought of  $x$ . This assumption automatically accounts for the observation that DPros can typically not be bound by subjects of propositional attitude verbs (Wiltschko, 1997). HB claim, however, that subjects of propositional attitude verbs can bind DPros that are contained in the respective complement clause, provided that there is a more prominent perspectival center available.

HB consider two scenarios where this is the case: First, a sentence with a propositional attitude verb is itself the complement clause of a higher propositional attitude verb. Since the subject of the higher propositional attitude verb is a more prominent perspectival center than the subject of the lower propositional attitude verb, binding by the latter but not the former should be possible. Second, a speaker uses an epithet to refer to the subject of a propositional attitude verb and thereby makes her own perspective maximally prominent. Since the subject of the propositional attitude verb is consequently the less prominent perspectival center, it should be able to bind a DPro contained in the respective complement clause.

- (1) a. Klaus behauptet, dass Lisa denkt, dass dessen Ferrari eine sinnvolle Investition war.  
b. Lisa behauptet, dass Klaus denkt, dass dessen Ferrari eine sinnvolle Investition war.  
*Klaus/Lisa claims that L./K. thinks that his (DPro) Ferrari was a sensible investment.*

We conducted three experiments to test the predictions of HB. The first two studies were sentence reading, eye-tracking experiments in which we tested the first prediction. In Experiment 1, 24 participants read 16 single sentences like the ones in (1a-b). Eight sentences were of the kind (1a, *dispreferred*) and eight of the kind (1b, *preferred*). Thus, in the *dispreferred* condition (1a), the matrix subject was male, agreeing in gender with the DPro, and the embedded subject was female. In the *preferred* condition, the matrix subject was female and the embedded subject male (which then agreed in gender with the DPro). Regions of interest were the noun phrase headed by the DPro *dessen* and including a noun (e.g., *dessen Ferrari*) as well as the immediately following word (spillover). These regions were identical between conditions. Eighty filler sentences were interspersed with the experimental sentences. Yes/no comprehension questions appeared after 25% of items (overall accuracy was 96%).

Analysis of log-transformed reading times showed that, compared to the *preferred* condition, readers slowed down in the noun phrase region of the *dispreferred* condition. This was evident for gaze durations,  $t(22) = 2.17$ ,  $p = .041$ , and total reading times,  $t(22) = 3.14$ ,  $p = .005$ . Interestingly, the observed reading slow-down persisted for the spillover word (gaze durations:

$t(22) = 2.03, p = .055$ ; total times:  $t(22) = 1.91, p = .069$ ). Taken together, these data suggest that DPros can more easily be interpreted as bound by the subject of embedded propositional attitude verbs than by the subject of matrix propositional attitude verbs. Now, in order to ensure that the observed contrasts were not due to recency effects, we conducted a second experiment, which was very similar in materials and design to Experiment 1. In Experiment 2, we varied the pronoun that headed the critical noun phrase, while holding binder-bindee distance constant. In both the *preferred* and *dispreferred* conditions, the matrix subject was male and the embedded subject female. However, in the *preferred* condition (2b), the pronoun of interest was a personal pronoun (PPro) *sein*, while in the *dispreferred* condition (2a) it was the DPro *dessen*. Other than pronoun type, sentences were again identical between conditions. After having run 13 out of the 24 participants, we already see a reliable reading slow-down for noun phrases in the *dispreferred* compared to the *preferred* condition, and this slow-down shows up in gaze durations,  $t(12) = 2.49, p = .028$ , regression path times,  $t(12) = 3.93, p = .002$ , and total reading times,  $t(12) = 2.41, p = .033$ . These effects spilled over to the subsequent word for gaze durations,  $t(12) = 1.91, p = .079$ . These data confirm that the contrasts in Experiment 1 were not due to recency.

- (2) a. Klaus behauptet, dass Lisa denkt, dass dessen Ferrari eine sinnvolle Investition war.  
 b. Klaus behauptet, dass Lisa denkt, dass sein Ferrari eine sinnvolle Investition war.  
*Klaus claims that Lisa thinks that his (DPro/PPro) Ferrari was a sensible investment.*

Addressing the second hypothesis, we conducted an eye-tracking study using a visual-world paradigm. We used short discourses, as the one in (3), and manipulated the "perspectival centerhood" of the topic of the current discourse topic (R1 = *der Polizist*): It was either mentioned again by a PPro (*er* in (3a)) or by an epithet (*der nette Wachtmeister* in (3b)). The discourse also introduced another human masculine referent (R2 = *der Fotografen*) as well as two non-human referents as distractors. The DPro, *der*, occurred in the complement clause of the third sentence. The display showed these four referents together with an unmentioned distractor object. Results show that R1 was less preferred than R2 in terms of focussing frequencies. But, in the epithet condition, R1 was reliably more preferred than in the PPro condition. In sum, then, R2 seems to be generally preferred as binder of a DPro, since it is less prominent than R1 in terms of discourse topicality, subjecthood, and agentivity in both conditions and because it is not the perspectival center with respect to the proposition denoted by the entire sentence or the one denoted by the embedded clause. At the same time, the fact that being referred to by an epithet boosts availability of R2 as binder of the DPro despite being maximally prominent with respect to discourse topicality, subjecthood, and agentivity, supports the claims made in HB.

(3) Sentences 1 and 2 (same in both conditions): Eine gute Nachricht. Der Polizist hat gerade das Motorrad abgestellt und redet mit dem Fotografen.

*Good news. The policeman has just parked the motorcycle and talks to the photographer.*

Sentence 3 prelude:

(a) Er erzählt soeben dem Fotografen, der eigentlich wegen der Kängurus hier ist,...

(b) Der nette Wachtmeister erzählt soeben dem Fotografen, der eigentlich...

Sentence 3 postlude (same in both conditions): *dass der im Lotto gewonnen hat.*

*He/the nice sergeant has just told the photographer who is here because of the kangaroos that DPro has won the lottery.*

**References:** Bosch, P. et al. (2007). The non-subject bias of German demonstrative pronouns. Hinterwimmer, S. & Bosch, P. (2016). Demonstrative pronouns and perspective. Hinterwimmer, S. & Bosch, P. (to appear). Demonstrative pronouns and propositional attitudes. Schumacher, P. et al (2016). Thematic role as prominence cue during pronoun resolution in German.