

Producing felicitous pronouns does not imply interpreting ambiguous pronouns like adults – Pronoun ambiguity resolution in primary school children

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Pronoun resolution has been extensively studied for over three decades across languages. However, studies on pronoun ambiguity interpretation in German have mainly focused on adults, and therefore, little is known about its development in children. Furthermore, while some studies have investigated pronoun production in children, we still lack knowledge how pronoun interpretation and production develop within the same child. Our study fills this gap, by investigating both components, i.e., pronoun ambiguity interpretation and pronoun production, in primary school children.

In ambiguous contexts, German allows for two third-person singular masculine pronouns to resolve ambiguity: the personal pronoun *er* and the demonstrative pronoun (d-pronoun) *der*, see Example (1).

- 1) Der **Tiger**_j will den **Igel**_k vorsichtig auf die Hand küssen, aber **er**_(j)/**der**_(k) kann nicht stillstehen.

The tiger wants to the hedgehog carefully on the hand kiss, but he cannot stay still.

'The tiger wants to kiss the hedgehog carefully on the hand but he cannot stay still.'

Previous studies have shown a strong preference for adults to resolve *der* towards the object and a moderate preference to resolve *er* towards the subject, allowing for more flexibility (Bouma & Hopp, 2007; Schumacher et al., 2017). To date, only one study (Blything et al., 2021) has investigated processing of pronoun ambiguity in German-speaking 7- to 10-year-old children using eye-tracking. However, this study focused on disentangling cues children use, e.g., order of mention, grammatical, and semantic role, and did not investigate their final interpretation. For pronoun production, previous studies have shown first instances of target-like pronoun production in ambiguous contexts in 5-year-olds. However, the productions are not always target-like and the age of mastering felicitous productions remains unclear (Bittner, 2007; Bittner & Kuehnast, 2012). Our study fills this gap by investigating children's interpretation and production of ambiguous pronouns in German.

We investigated 6- to 10-year-old monolingually raised German children (n=50) and compared them to adults (n=65). Data collection is ongoing aiming for 70 children. In an online picture selection task, participants listened to sentences with two competing characters, followed by an ambiguous pronoun (*er* or *der*), see Example (1). While listening to the sentences, participants saw three images on the screen, representing the competing subject, object and a distractor. After each sentence, participants were asked a comprehension question that forced them to interpret the pronoun towards one of the two characters (subject/object). Responses were given by clicking on the image of the respective character. In a narrative production task, that was completed by children only, they listened to a model story while looking at accompanying images. Afterwards, children had to re-tell the story. The story contained three characters, two masculine characters (e.g., *Hund* 'dog', *Junge* 'boy') and a feminine character (e.g., *Maus* 'mouse'). Hence, children had to include and to disambiguate all three characters when re-telling the story.

In the pronoun interpretation task, overall, results showed similar patterns in children and adults, see Figure (1). Both groups preferably resolved the d-pronoun towards the object and the personal pronoun towards the subject. Despite the similarity, in a mixed-effects logistic regression model with resolution preference as dependent variable and pronoun as independent variable the results showed that children differed significantly from adults (*der*: $\chi^2=16.66$, $df = 1$, $p < .001$; *er*: $\chi^2=6.53$, $df = 1$, $p < .01$). Furthermore, the children's preferences showed more variability than the adults' preferences. We conducted a mixed-effects logistic regression

model that showed that neither internal (age, working memory) nor external factors (vocabulary, socioeconomic status) predicted resolution preferences. Therefore, the source for individual variation remains unclear. In the pronoun production task, data analyses are ongoing, with preliminary results showing that most of the children produced narratives with felicitous pronouns, resolving ambiguity between the characters involved in the narrative.

Our study indicates a discrepancy between production and comprehension skills. While 6- to 10-year-old children seem to produce felicitous pronouns and to resolve ambiguity successfully in narrations, they do not yet resolve ambiguous pronouns in the same way as adults in interpretation. This provides evidence that at the beginning of primary school, despite good production skills processing of ambiguous pronouns is still developing. The results indicate that when investigating reference skills of children drawing conclusions based on either production or interpretation skills might be misleading. A combination of both measurements is needed to understand reference skills in primary school children.

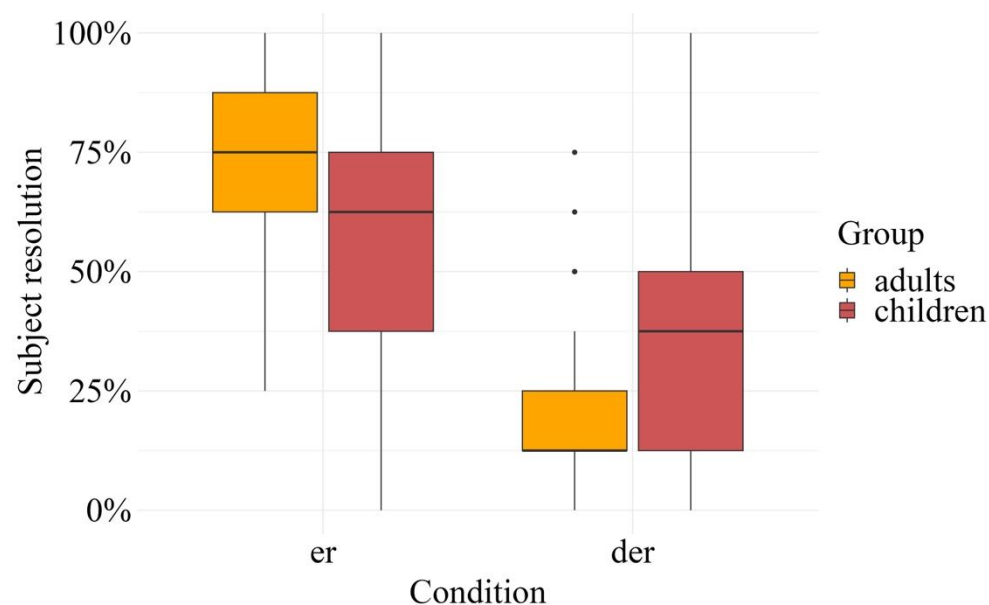


Figure 1: Subject interpretation in children and adults for the d-pronoun *der* and the personal pronoun *er*

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