

Background German is a double negation language (DN): each negative element contributes semantic negation to the sentence meaning such that, when two such elements co-occur, they cancel each other out, as shown in (1). Contrast this with negative concord (NC) languages like Italian in (2), which exhibit concord between the negation and the negative quantifier, resulting in a single-negation reading Laka (1990).

- (1) Hans hat kein Buch nicht gelesen.
Hans has no book not read
'Hans did not read no book.' Lit: Hans read every book.
- (2) *(Non) è venuto nessuno.
not has come nobody
Nobody came.

Zeijlstra (2008) argues for a correlation between the headedness of a negative marker and the concord status of that particular language; in NC languages negative markers are heads (e.g., *non* in Italian is a head) whereas in DN languages negative markers are adverbs (e.g., German *nicht* and English *not*). For economy considerations, he takes the default setting to be that of an adverbial negation. Thornton et al. (2016) present experimental evidence that children speaking standard English (24 children, 3;6 – 5;8, $M = 4;7$) appear to comprehend sentences with two negative elements in a way compatible with a NC grammar, despite the fact that standard English-speaking adults have a DN grammar. They argue that English-speaking children go through an NC stage due to the existence of a negative marker that is a head, namely *n't*, which makes children adopt an NC grammar.

The present study aims to understand how German-speaking children interpret multiple negations by testing the interaction between negation *nicht* and the negative quantifier *kein*. Since German lacks a negative marker that is a head, unlike English, we hypothesize that German-speaking children, like German-speaking adults, should not accept sentences with *kein* and negation in a NC context.

Experiment We tested 25 monolingual German-speaking children (4;2 – 6;5, $M = 5;2$) and 10 monolingual adult speakers with a Truth Value Judgment Task.

The experiment consisted of 12 stories (video+audio), each made up of 3 scenes, as shown in Figure 1. Each story begins with a context set-up, e.g., "There is a rabbit who doesn't like to eat vegetables. Today, there is broccoli, a carrot, and a pepper to eat. Let's see what happens!" Each scene begins with the rabbit in front of a table with all 3 vegetables. In scene 1, animation shows the rabbit eating two out of the three vegetables on the table. Scene 2 is identical to scene 1, except for the vegetable that is left uneaten. The animation in scene 3 shows one of the three possible endings: the rabbit having eaten (i) all the vegetables (DN), (ii) none of the vegetables (NC), or (iii) 1/3 vegetables (control-false).

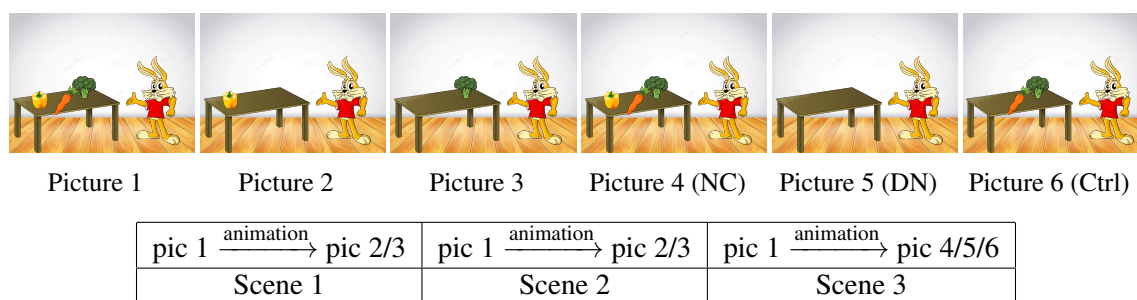


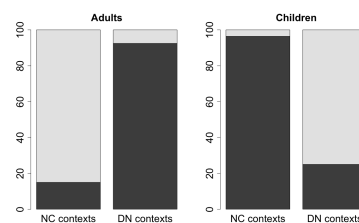
Figure 1: Story development

The audio consisted of the puppet uttering a filler sentence after each of the first two scenes, and the test sentence after the last scene (2 fillers + 1 target item per story); the pictures remained on the screen as the audio played. The participants' task was to judge whether what the puppet said was correct. Filler sentences contained the negation *nicht* but not *kein*, as in (3). Half of the filler sentences were true, the other half, false. The target sentences contained both *kein* and *nicht*, as in (4).

- (3) Der Hase hat den Brokkoli nicht gegessen.
The rabbit has the broccoli not eaten
'The rabbit did not eat the broccoli.'
- (4) Der Hase hat kein Gemüse nicht gegessen.
the rabbit has KEIN vegetable not eaten
DN: 'The rabbit ate all the vegetables.'
NC: 'The rabbit didn't eat any vegetables.'

It's crucial to note that the stories were constructed so as to make the use of two negations in the test sentence in scene 3 felicitous. Scenes 1 and 2 depict images that allow the puppet to utter sentences with *nicht*, thus creating the right context for the use of *kein* in the presence of *nicht* in the last scene.

Results Two children were excluded because their responses to filler sentences containing only *nicht* were at chance or worse (Binomial test: fewer than 18 items out of 24 correct). Two other children were excluded because they did not reject any of the control items. We report results from the remaining 21 child and 10 adult participants. There were four items each in NC, DN, and control conditions, resulting in 84 responses from child participants per condition. Children accepted the test sentences with *kein...nicht* in the NC context 96.4% of the time (81/84), whereas they accepted them in the DN context 25.0% of the time (21/84). This difference is significant (Fisher's exact test: $p < 0.01$), showing that the acceptance (and rejection) of the sentences with *kein* and negation in the NC and DN conditions exhibit different patterns. Adults accepted (4) in the NC context 15.0% of the time (6/40), and accepted it in the DN context 92.5% of the time (37/40). Children responded correctly to filler items 93% of the time (581/624), indicating that these child participants understand the meaning of negation. Since half the fillers were true and half false, there couldn't be a yes/no bias. The results of our study, therefore, suggest that German-speaking children have a NC grammar, contrary to our hypothesis.



This result is furthermore interesting in light of the observation that German-speaking children produce sentences with bare *kein* without an accompanying negation to express a negated existential, as in (5) in the CHILDES database. In other words, children can also exhibit adult-like behavior. Note that the same child is elsewhere recorded as producing a *kein...nicht* bundle, (6). The explanation of what happens next (Leo hoping that the bell(s) would ring) points to an NC interpretation for (6).

- | | | | |
|---|---------------------------|---|---------------------------|
| <p>(5) Mama keine Mütze.
Mama keine hat
'Mama no hat'</p> | <p>CHILDES: Leo 20206</p> | <p>(6) keine Glocken nicht da!
keine bells not there
'no bell there!'</p> | <p>CHILDES: Leo 20202</p> |
|---|---------------------------|---|---------------------------|

General Discussion How can we reconcile these two seemingly distinct uses of *kein* in children? We follow Zeijlstra (2004) and Penka (2007), a.o., and take *kein* to express an existential quantifier carrying a UNEG feature which must be checked by an element carrying an INEG feature. We take this element to be a covert operator, call it OP_{-} , whose semantic contribution is logical negation. We propose that sentential negation carries a UNEG feature in child grammar. Assuming Multiple Agree, the UNEG features on *kein* and *nicht* can both agree with the same INEG on OP_{-} , thus a sentence containing both *kein* and *nicht* will be interpreted as containing a single negation. This combination of features predicts that *kein* should be able to occur on its own and take on a negative meaning; the only way it can be licensed is if it occurs in the scope of OP_{-} , which is what contributes the negative meaning. Under this analysis, *nicht* and *kein* thus exhibit completely parallel behavior: they can occur on their own, in which case they contribute a negation, but when they co-occur, their combined contribution is that of a single negation. In the case of adult grammar, the only difference is that the sentential negation takes on negative semantics; one possible analysis could be that it gets reanalyzed as having an INEG feature.

Our results are puzzling given Zeijlstra's 2008 analysis: since German does not have a negation that is a head, German-speaking children should not exhibit parallel behavior to English-speaking children, that is, they should have no indication that an NC grammar is appropriate. So we are left with a puzzle as to why German-speaking children should go through a NC stage at all. There are two directions to consider: (i) if we maintain that DN is a default, as per Zeijlstra's account, then something other than the headedness of the negation needs to be the cause, or (ii) NC, rather than DN, is the default setting, regardless of the headedness of negation in that language, and headedness comes into play only once the adult grammar emerges. We leave this to future research and acknowledge that immediate experimental research should look into (i) whether there is a difference in the acquisition pattern of *kein NP*, *nichts* and *nicht*, and (ii) what corpus work tells us about the production pattern of these negative words.

References ★ Laka 1990. *Negation in syntax*. MIT thesis. ★ Penka 2007. A cross-linguistic perspective on n-words. *International Journal of Basque Linguistics and Philology*. ★ Thornton et al. 2016. Two negations for the price of one. *Glossa*. ★ Zeijlstra 2004. *Sentential negation and negative concord*. UoA thesis. ★ Zeijlstra 2008. Negative concord is syntactic agreement. Ms. Amsterdam.