

On the acquisition of polarity items:

11-12-year-olds' comprehension of German NPIs and PPIs

Juliane Schwab (Osnabrück University, jschwab@uos.de), Mingya Liu (Humboldt University of Berlin), and Jutta L. Mueller (University of Vienna)

Existing work on children's acquisition of polarity-sensitive expressions (PSIs) suggests that children are sensitive to the restricted distribution of NPIs from early on, such that studies on highly frequent NPIs like English *any* [2] or Dutch *hoeven* [1] find that 2-5-year-olds (i) produce few unlicensed NPI uses and (ii) show a low acceptance of unlicensed NPIs in comprehension tasks. At the same time, we still know surprisingly little about the time course for the acquisition of less frequent NPIs or even about the acquisition of PPIs. The distributional restriction of PPIs may be particularly difficult to acquire given the absence of a lexical element as licenser and PPIs' ability to appear under metalinguistic negation (e.g. “*She didn't call SOMEONE_{PPI}, she called the president!*”). In the present study, we therefore investigate 11-12-year-old children's comprehension of two German NPIs and two German PPIs using an auditory naturalness rating task. Additionally, we report corpus data on the PSIs' frequency in children's and child-directed speech that motivates our experimental investigation.

Experiment. We created 32 items in 8 conditions (see (1)), such that all items contained the PSIs *jemals* ('ever'_{NPI}), *so recht* ('really'_{NPI}), *absolut* ('absolutely'_{PPI}) or *durchaus* ('indeed'_{PPI}) in licensed and unlicensed contexts. The sentences were recorded by a female speaker and played over headphones during the experiment. Each participant heard only one condition of each item; experimental items were pseudorandomly intermixed with 16 grammatical filler items. In each trial, participants listened to a sentence and answered a question regarding its content (e.g. “In the city centre, Anna was... (a) at the playground (b) shopping”) before rating the naturalness of the sentence on a 1-7 scale. The experiment was conducted once with adult German native speakers (Exp. 1) and once with 11-12 year-old monolingual German native speaking children (Exp. 2). In the child study, we used smileys along the scale to illustrate the meaning of the naturalness rating responses and added additional practice procedures before the experiment to ensure that all children understood the task.

(1) a. *Anna hat *der* Spielplatz in der Innenstadt *so recht* gefallen.

b. Anna hat *kein* Spielplatz in der Innenstadt *so recht* gefallen.

Anna has [*the/no] playground in the city centre really_{NPI} liked.

c. *Anna hat *der* Spielplatz in der Innenstadt *jemals* gefallen.

d. Anna hat *kein* Spielplatz in der Innenstadt *jemals* gefallen.

Anna has [*the/no] playground in the city centre ever_{NPI} liked.

e. Anna hat *der* Spielplatz in der Innenstadt *absolut* gefallen.

f. *Anna hat *kein* Spielplatz in der Innenstadt *absolut* gefallen.

Anna has [the/*no] playground in the city centre totally_{PPI} liked.

g. Anna hat *der* Spielplatz in der Innenstadt *durchaus* gefallen.

h. *Anna hat *kein* Spielplatz in der Innenstadt *durchaus* gefallen.

Anna has [the/*no] playground in the city centre indeed_{PPI} liked.

Corpus study of child(-directed) speech. We extracted all instances of *je(mals)_{NPI}*, *so recht_{NPI}*, *durchaus_{PPI}*, and *absolut_{PPI}* from the German CHILDES corpora and annotated them for their use as (un-)licensed PSI (Table 1). The data show that all four PSIs are present in child-directed speech, albeit with relatively low overall frequency. *Jemals* ('ever') is less frequent than the other PSIs. All instances were licensed uses. In children's speech, we only find few instances

of the four investigated PSIs. Due to their low frequency in the corpora, we reasoned that children might achieve an adult-like knowledge of these expressions relatively late in their childhood. This motivated our decision to target 11-12-year-olds for the present study. To provide an indication for the general frequency of the investigated PSIs, we also provide their frequency in the written-language German reference corpus DeReKo in Table 1.

Results for adults (subject N = 36). The data was analysed using Bayesian ordinal regression models. The effect of context (licensed/unlicensed) was treatment coded; the PSI comparisons were entered as custom contrasts such that the model included a comparison between the two NPIs and PPIs, a comparison between *so recht* and *jemals* (the NPIs), and a comparison between *absolut* and *durchaus* (the PPIs). The results indicate that, as expected, adults clearly distinguished between licensed and unlicensed PSIs (Fig. 1): sentences containing unlicensed PSIs were rated less natural than their licensed counterpart ($\mathbb{E}(\mu) = -2.19$, $CI = [-2.54, -1.87]$, $P(\delta < 0) = 1$). Additionally, we find some differences among the two NPIs/PPIs, respectively: unlicensed *so recht*_{NPI} was not rated as unnatural as unlicensed *jemals*_{NPI} ($\mathbb{E}(\mu) = 1.15$, $CI = [0.63, 1.69]$, $P(\delta > 0) = 1$), and unlicensed *absolut*_{PPI} not as unnatural as unlicensed *durchaus*_{PPI} ($\mathbb{E}(\mu) = 1.38$, $CI = [0.93, 1.85]$, $P(\delta > 0) = 1$).

Results for 11-12-year-olds (data collection incomplete due to Covid-19 pandemic; subject N = 21). Data from the first 21 participants show an adult-like directionality in the naturalness ratings but lack the clear separation between unlicensed and licensed PSI uses that was apparent in the adult data (Fig. 2). Somewhat mirroring the adult data, the grouped data suggest that *so recht* and *absolut* in particular may not yet be well-acquired by 11-12-year-olds. Individual participants' responses (not depicted) further demonstrate that this pattern emerges because most children clearly distinguish between the unlicensed and licensed instances of *jemals* and *durchaus*, but only some do so for *so recht* and *durchaus*. As data collection is incomplete, we do not report inferential statistic test results.

Conclusion. The acquisition of PSIs, while taking place in early childhood for highly frequent NPIs [1,2], does not appear to be complete even by the age of 11-12 for those PSIs that are relatively infrequent in children's early language input. Our poster presentation will further discuss the comparison between PPIs and NPIs in our experiment, as well as future directions for work on the acquisition of PSIs.

References. [1] Lin et al. (2015): Emerging NPIs: The acquisition of Dutch *hoeven* "need". [2] Tieu & Lidz (2016): NPI licensing and beyond: Children's knowledge of the semantics of any.

Source	Type	<i>je(mals)</i> 'ever'	<i>so recht</i> 'really'	<i>absolut</i> 'absolutely'	<i>durchaus</i> 'indeed'
CHILDES	child-directed speech	18	40	36	32
CHILDES	child speech	0	8 (youngest: 3;00.24)	1 (age 3;03.13)	1 (age 4;08.11)
DeReKo (tagged-t archive)	written language corpus	9,341	6,688	34,100	89,311

Table 1. Frequency of the investigated NPIs and PPIs in the German CHILDES corpora and in DeReKo.

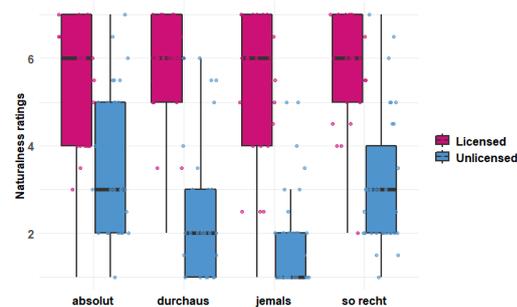


Figure 1. Adult data (Exp. 1)

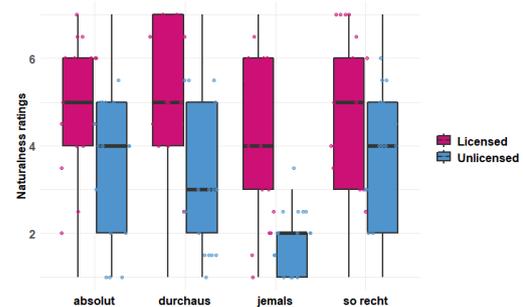


Figure 2. Child data (Exp. 2)