Self-repairs in German children's peer interaction – initial explorations

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Abstract

Forty-nine self-repairs were extracted from a corpus of conversational speech of ten German children (mean age 5;1) with peers. The repairs were analysed using [1]'s classification and compared with his adult data. Children produced fewer appropriateness repairs than adults, but more covert repairs and more phonetic repairs. Like adults, children had a preference to interrupt themselves within-word only for error repairs. Unlike adults, children did not produce editing terms following interruptions.

1. Introduction

If there is one group of speakers that we may expect to be engaging in self-repair of their speech, it is young children. They are, after all, still in the process of learning language and more error-prone than adult speakers. Yet while self-repair in adult speech has attracted the interest of researchers since the 1970s – both from conversation-analytical and psycho-linguistic perspectives – children's use of self-repair has been studied to a much lesser extent.

Research in this area has mostly been concerned with disfluencies in general and has often been clinically motivated, using speech elicitation techniques such as imitation or modelled production [e.g., 2, 3] in order to find diagnostics for children at risk of developing speech impairments. However, in order to gain a better understanding how (typically developing) children monitor and repair their speech in real life, and to what extent their repairs pattern with those of adults, it would appear more useful to look at productions in more natural environments.

Recently, [4, 5] analysed children's speech when talking with their caretakers (note, however, that only active declarative sentences were analysed). [4, 5] categorized children's disfluencies as either stalls or revisions. "Stall" pertains to "all sentences disruptions that add no new phonological, lexical or grammatical material to a sentence" [4:819]. In contrast, "revisions" are changes in phonology, lexical choice or morphosyntax (ibid.) Analysing stall and revision patterns of children between 1;10 and 4;0, they found that the revision rate increased with age, while stall rate did not. Based on this contrastive pattern, [4, 5] argue that stalls and revisions are indications of two different phenomena. Stalls are assumed to be the result of incremental sentence production, where higher levels of processing (e.g., formulating) pass their results on to lower levels (e.g., articulation). When a speaker has already begun to speak, a "glitch" [4:820] at a higher level can force him or her to stall. Revisions, on the other hand, are corrections that are made because an error has been detected in overtly produced speech. It is assumed that certain deviations from the intended message can only be detected (and corrected) when speakers themselves hear them.

While the stall/revision dichotomy is an interesting framework for studying developments in sentence production, summarizing all types of overt repairs as revisions does lead to loss of some detail that may be informative about differences or similarities between adults' and children's speech production. For adult speakers, [1] distinguished among others between appropriateness repairs (A-repairs), such as the replacement of a more general term with a more specific one (e.g., *book – novel*) and error repairs (E-repairs), such as corrections of mispronunciations (e.g., *drim – drink*). He observed that speakers are more likely to interrupt their speech within a word when the word is erroneous than when it is merely less appropriate. [1] suggested that this has pragmatic reasons: "it is all right to interrupt a word which needs total replacement because it is erroneous, but it is not good practice to interrupt a correct word which only needs further specification" [1:63]. An interesting question for child language researchers is whether children do show the same tendency.

What is more, the stalls/revisions framework does not look at the distribution of so-called editing terms (or fillers) such as "uh" or "uhm"; utterances containing such terms are subsumed under revisions, along with repetitions (which may or may not contain editing terms themselves). But for adult speech, editing terms have been argued to be flags for upcoming delays [6], which also benefit the listener's speech comprehension [e.g., 7]. (Note, however, that fillers are not exclusively used for this purpose, see [8].) If fillers/editing terms play an important role in adult conversation, learning to use them in appropriate contexts is also something children need to do in order to become competent speakers of their language.

Against this background, this study asks the following research questions:

1. What types of self-repairs do children produce in spontaneous peer-to-peer conversations?

2. Do children's self-repairs differ in structure or distribution from those of adult speakers? If so, in what way?

In order to answer these questions, I analysed self-repairs in German children's peer-interaction using [1]'s classification of repairs and compared them with the adult data reported by [1]. The data presented here is a subset of data that is currently being collected for an on-going project on children's acquisition of dialogue competence.

2. Method

2.1. Participants

The participants were ten German children (five boys, five girls) between 4;10 and 5;9 years (mean age: 5;1) who had been recruited through local nursery schools. All children were typically developing and had no reported speech/language impairments or other developmental deficits. Informed written consent was obtained from the caregivers.

2.2. Procedure

The children were recorded during free (i.e., unsupervised) activities at their nurseries, such as drawing or playing with building blocks and toy animals. The recordings were made in HDV 1080i format using a Canon XH G1s camera and a Sennheiser ME 80 microphone. The microphone was attached to a boom pole to capture the conversations from nearby and avoid recording too much ambient noise. Post-production was done using Final Cut pro 5 on a Power Mac G5 computer. The total number of analysed recordings was about 50 minutes long.

2.3. Transcription

The data were transcribed orthographically in [9], using modified GAT transcription rules [10].

2.4. Data selection and coding

Following [1] a stretch of speech was considered a self-repair if there was a hesitation or a pause (either with or without an editing term) that was followed by a repetition of parts of the original utterance (OU) or an altered version of the OU. Unfilled pauses that were not followed by a repetition or a replacement were not categorized as repairs. Repetitions that were used to hold the floor were not coded as repairs.[1] All 49 repairs were coded to be one of nine categories used in [1][2] (repairs are underlined):

(1) **AA-repairs**: appropriateness repairs that are intended to reduce potential ambiguity.

We	beginnen	in	het	midden	met...
You	*start*	*in*	*the*	*middle*	*with...*

in	het	midden	van	het	papier
in	*the*	*middle*	*of*	*the*	*paper*

(2) **AL-repairs**: appropriateness repairs used by speakers to change the level of reference, often to be more specific.

... met	een	blauw	vlakje,	een	blauw	rondje ...
... with	*a*	*blue*	*spot,*	*a*	*blue*	*disc ...*

(3) **AC-repairs:** appropriateness repairs used by speakers to make their utterance more coherent with the previous text.

Du	kannst	diese	Ladung	hier	da	reinkippen
You	*can*	*this*	*load*	*here*	*there*	*pour-in*

(4) **EF-repairs**: phonetic repairs.

Guck	mal	wie	weine	wenig...
Look		*how*	*lett*	*little...*

(5) **EL-repairs**: repairs of lexical errors (word substitutions).

Wann	wo	ist	die...
When	*where*	*is*	*the*

(6) **ES-repairs**: syntactic repairs.

Da	halt	werden	(...)	gehalten
There	*hold*	*are being*	*(...)*	*held*

(7) **C-repairs**: covert repairs, which consist of either just an interruption and an editing term or the repetition of one or more lexical items.

Weil	ich	weiß	ich	weiß...
Because	*I*	*know*	*I*	*know...*

(8) **D-repairs**: the speaker replaces the current message with a different one, often changing the linearization of events.

Der	fliegt	dann	der	rutscht	dann
He	*flies*	*then*	*he*	*slides*	*then*

und	dann	fliegt	er
and	*then*	*flies*	*he*

(9) **R-repairs**: repairs that were too confused to be assigned to one of the other categories (rest).

In addition, all repairs (with the exception of C-repairs, see below) were coded for:

- whether the repair was immediate or delayed (i.e. whether the repair occurred within or right after the to-be-repaired item – the *reparandum* – , or only several syllables later),
- the length of the delay (in syllables),
- whether the interruption occurred within a word or after a word,
- whether the retracing was immediate or anticipatory (i.e., whether parts of the OU preceding the repaired word were repeated),
- the length of the retracing span (in syllables),
- whether an editing term was used, and
- the position of the repair in the conversation as defined by [11] (i.e., in the same turn, in the transition space between turns or in the next turn).

As the *reparandum* of a C-repair is unclear, it is not possible to discern whether the repair was immediate, what the length of the delay is, whether retracing was immediate or what the length of the retracing span is. The same holds for D-repairs and R-repairs.

3. Results

3.1. Repair types

There were 49 self-repairs in the data. The absolute and relative frequencies of the different types are shown in Table 1.

[1] This refers to only one situation where a child was being interrupted by another child and then repeated one word several times in a loud voice until the other child had stopped talking.

[2] Examples (1) and (2) are taken from [1] as they did not occur in the child data. All other examples are taken from the corpus.

Table 1: *Absolute (N) and relative (%) frequencies of repair types.*

Repair type	N	%
AA	0	0
AL	0	0
AC	5	10.2
EF	6	12.2
EL	14	28.6
ES	1	2.0
C	18	36.7
D	3	6.1
R	2	4.1
Total	**49**	**100.0**

The most frequent repair type (36.7%) was C-repair. All E-repairs together account for 42.8%, with EL-repairs being the most frequent among them (28.6% of all repairs). Only 10.2% of all repairs were A-repairs, and children did not produce any AA- or AL-repairs at all. D-repairs and R-repairs were rather infrequent (6.1 and 4.1%, respectively).

Figure 1 shows the relative frequencies in comparison with the adult data reported by [1].

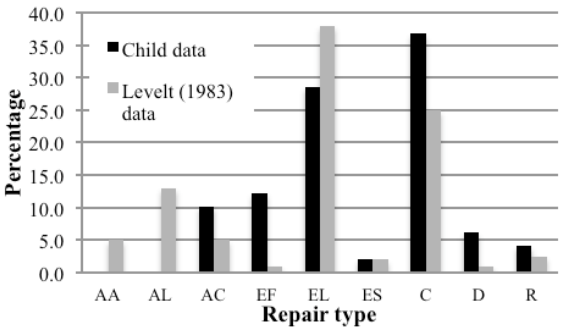

Figure 1: *Relative frequencies of repair types for child data and adult data reported by [1].*

The overall distributions are comparable in several respects. Syntactic repairs, for example, are rare in both the adult and the child data, and E-repairs are made more often than A-repairs in both groups. But three main differences can be observed: First, while the most frequent repairs in adults were lexical repairs (EL-repairs), children produced mainly covert repairs (C-repairs). Second, children corrected phonetic errors (EF-repairs) more often than adults. Third, ambiguity reducing (AA) and level (of reference) changing (AL) appropriateness repairs did not occur at all in the child data. I will come back to these differences in the Discussion.

3.2. Site of interruption

All but one of the 49 self-repairs occurred within the speaker's turn. In one case, it could be argued that the repair was done in the transition space, but given that the pause between OU/interruption and repair was exceptionally long (6.05 seconds), this item is somewhat difficult to classify. In any case, all self-repairs were also self-initiated.

In what follows, only the 26 A- and E-repairs will be considered, following the analysis in [1]. (Recall that sites of interruption cannot be determined for the other repair types.) Of those 26 repairs, 12 occurred within-word. This means that speakers aborted right in the middle of a word. In 14 cases, a repair occurred only after a word had been completed.

Were these disruptions produced immediately or with a delay? Note that these two variables are independent of each other: A within-word disruption may occur either within the *reparandum* itself or right after it (immediate repair), or only after the speaker has uttered other syllables following the *reparandum* (delayed repair). Likewise, a repair may be initiated after a word has been completed, be it the "trouble word" (immediate repair) or a following word (delayed repair). It turned out that only four out of 26 repairs were delayed, all other 22 repairs were immediate. The longest delay observed was three syllables.

How were these disruptions distributed across A- and E-repairs? The absolute numbers are given in Table 2.

Table 2: *Within-word and after-word interruptions (absolute frequencies) for appropriateness and error repairs, grouped by immediate vs. delayed repair.*

	Immediate		Delayed		Total
	Within-word	After-word	Within-word	After-word	
A-repairs	0	3	0	2	5
E-repairs	11	8	1	1	21
Total	11	11	1	3	**26**

It becomes clear that A-repairs never occurred within-word. In other words, children never interrupted themselves halfway into a word when they were making an appropriateness repair. In contrast, E-repairs occurred both within-word and after-word, with within-word interruptions slightly more often (for immediate repairs). The relative distribution is similar to that observed by [1]. I will return to these observations in the Discussion.

3.3. Editing terms

Only in two cases did children produce an editing term: one time "ähm" was used, in the other case "äh". Both editing terms occurred in C-repairs. The first case is provided in (10).

(10) ja weil das (.) ähm (--) das is nur der Boden.
yes because this (.) uhm (--) this is only the ground.

The near-absence of editing terms in the data is striking and will be returned to in the Discussion.

3.4. Restarting

When children restarted after an interruption, how far did they go back in the OU? (For reasons explained above, the analysis is again limited to A- and E-repairs.) The large majority of restarts were instant replacements (20). This means that the children did not retrace further than the *reparandum* itself. Note that instant replacements do not have to be immediate repairs. A speaker may initiate repair with a delay, but not retrace to an earlier word in the OU. In five cases children did retrace, but the retracing span was mostly one syllable only. Once a child made what [1] called a *fresh start*: she copied parts of the OU, but they were preceded by new material.

4. Discussion

When conversing with same-aged peers, five-year-old children monitor and repair their speech for (real or subjectively perceived) errors. Their behaviour is in many ways already similar to that of adults, but there are also differences that show that development in this area is not yet complete.

Like adults, children are more likely to repair real errors (E-repairs) than to make appropriateness repairs (A-repairs).

Children typically interrupted themselves within-word only when the word was erroneous, not when it was merely less appropriate. This is what [1] found for adult speakers. [1] explained this preference on pragmatic grounds, and if this was the case, the child data would suggest that children understand the difference between those two and their respective relevance for the discourse. But another explanation is possible as well: Perhaps detecting inappropriateness involves higher-level processes and simply takes more time than detecting real grammatical errors. In that case, the similarity of children and adults just reflects the way speech comprehension works in both groups.

Children did, however, produce fewer A-repairs overall than adults, and produced only one type of them. The higher incidence of AA- and AL-repairs in [1]'s data could have been task-induced (describing visual patterns to someone who cannot see them). Alternatively, children may be paying less attention to monitoring common ground (CG) and therefore notice fewer words that could be improved for the benefit of the interlocutor. For adults, it has been suggested that CG is not part of the initial utterance design and that monitoring one's utterances for CG violations is resource-dependent [12]. Given that children's language and memory capacities are still developing, these resources may not be available to them at all times. (This need not have a detrimental effect on their conversation, though, as ambiguity of reference accounts only for a fraction of misunderstandings, see [13].)

The finding that children produced relatively more phonetic repairs than adults (EF-repairs) is perhaps least surprising. Around the age of five, phonological development is not yet completed and articulation – even of function words – is less automatized than in adults [14].

A further difference between children and adults emerged in the proportion of C- and EL-repairs. Children produced more C-repairs, while adults produced more lexical replacements. Again, the reason for the dominance of EL-repairs in the adult data could be task-related: [1]'s subjects had to use many different colour terms and confused them frequently. Still, the high proportion of C-repairs in children is interesting, although the nature of C-repairs makes them difficult to analyse. [4] assumes that C-repairs (*stalls* in his terminology) are simply used to buying time during the course of sentence production. Another possibility is that – due to the still developing grammar – children's parser is less reliable in checking for grammaticality, and may produce more "false alarms" (on either inner speech or overt speech).

A striking feature of the children's repairs was the near-absence of editing terms. In contrast, [1] found that in adult speech, 58% of all repairs were preceded by an editing term. Relative dearth of filled pauses has also been observed in a picture story telling task with five-year-olds [15, 16], suggesting that this is a characteristic speech feature of that age. It seems that children have not yet learned to signal delays to their interlocutor – it would be interesting to study in more detail what effect this may have on their turn-management (with peers and with adults).

Finally, children's repairs were predominantly instant repairs, while adults have been found to retrace further in the OU and produce more fresh starts. This variance may be attributable to differences in short-term memory.

The findings presented here are based on a limited data set and invite further investigations, such as:

- When do children start approaching adult behaviour in the use of editing terms?
- Do children engage in more appropriateness repairs with increasing age?
- What is the influence of social context – does it matter to their self-repair behaviour whether children talk to same-aged peers or to adults?

By enlarging our database of conversational speech – from children of different ages and in different social contexts – we hope to find answers to some of these questions.

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