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 psycholinguistic 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.

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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]:

(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 wet 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.

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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.
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].

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 (EL-repairs) and children produced mainly covert repairs (C-repairs). Second, children corrected phonetic errors (EL-repairs) more often than a reparandum (EF-repairs) than to make appropriateness repairs (AC-repairs). Third, ambiguity reducing repairs (AL) and level (of reference) repairs (AA-repairs) were rather infrequent (6.1 and 4.1%, respectively).

When children restarted after an interruption, how far did they retrace? Note that instant replacements do not have to be immediate repairs. The relative distribution is similar to that observed by [1]. I will return to these observations in the Discussion.

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.

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 inappropriateness 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.

5. Acknowledgements

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6. References

Self-addressed questions in disfluencies

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Abstract

The paper considers self-addressed queries – queries speakers address to themselves in the aftermath of a filled pause. We study their distribution in the BNC and show that such queries show signs of sensitivity to the syntactic/semantic type of the sub-utterance they follow. We offer a formal model that explains the coherence of such queries.

1. Introduction

How to characterize the context associated with hesitations? For production, [3] claimed that fillers like ‘uh’ and ‘um’ should be treated as words with different distributions (‘uh’ more for short pauses, ‘um’ for long pauses) and with discourse functions intended by the speaker. ([10] proposes a related account for Swedish glottalized filled pauses. Clark and Fox-Tree’s hypothesis has more recently been strongly disputed for distributional differences [12] as well as with respect to speakers’ intentions [4].

In this paper we consider a phenomenon that occurs in the aftermath of a filled pause, namely self-addressed queries, exemplified in ((1)):

(1) a. Carol 133 Well it’s (pause) it’s (pause) er (pause) what’s his name? Bernard Matthews’ turkey roast. (BNC, KBJ)

b. They’re pretty ... um, how can I describe the Finns? They’re quite an unusual crowd actually.

http://www.guardian.co.uk/sport/2010/sep/10/small-talk-steve-backley-interview

The question we investigate is whether such queries are essentially reflexive or show signs of sensitivity to the (the syntactic/semantic type of) the sub-utterance they follow.

Section 2 describes a corpus study we ran on the BNC to investigate this issue. The study demonstrates clearly a strong effect, with distinct distributions clustering around a small number of triggering contexts. After brief discussion of the results in section 3, section 4 provides a formal model in which we analyze the coherence of such moves, as part of an account of what we call forwards-looking disfluences – disfluencies where the moment of interruption is followed by a completion of the utterance which is delayed by a filled or unfilled pause (hesitation) or a repetition of a previously uttered part of the utterance (repetitions).

Conclusions and further work are provided in section 5.

2. Corpus study

We ran a corpus study on the BNC, using the search engine SCoRE ([14]) to search for all self-addressed queries. We searched using the pattern ‘noun preceding ‘er’ or ‘erm’ preceding a wh word, adjacent to a verb.’ This yielded 692 hits, from this we manually selected all self-addressed queries, resulting in a corpus of 83 queries.

Representative examples are in (2) and the distribution is summarized in Table 1. Tables 2–6 provide a detailed summary of queries found, relative to triggering

(2) a. (anticipating an N*): on top of the erm (pause) what do you call it?

b. (anticipating a locative NP): No, we went out on Sat , er Sunday to erm (pause) where did we go?

c. (anticipating an NP complement): He can’t get any money se (pause) so he can’t get erm (pause) what do you call it?

d. (anticipating a person–denoting NP): But you see somebody I think it was erm what’s his name?

e. (anticipating a person–denoting NP: with erm, who was it who went bust?

f. (anticipating a predicative phrase: she’s erm (pause) what is she, Indian or something?

Table 1: Distribution of Self addressed questions in disfluencies in the British National Corpus

<table>
<thead>
<tr>
<th>Categorial context</th>
<th>Questions found</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre NP; prer _ or verb _ or NP and _</td>
<td>42</td>
</tr>
<tr>
<td>det _</td>
<td>20</td>
</tr>
<tr>
<td>locative prep _</td>
<td>12</td>
</tr>
<tr>
<td>be _</td>
<td>5</td>
</tr>
<tr>
<td>say _</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total self addressed questions</strong></td>
<td><strong>83</strong></td>
</tr>
</tbody>
</table>

Table 2: Distribution of Self addressed questions in pre NP context

| What's his/her name? | 19 |
| what do they you call him/her/it? | 13 |
| who was it/the woman? | 3 |
| what’s the other one? | 3 |
| what did you I say? | 2 |
| what did it mention? | 2 |
| **Total** | **42** |