



Linguistic disfluency in narrative speech: Evidence from story-telling in 6-year olds

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Abstract

The paper deals with the production of mazes in narrative speech. The analysis is based on experimental data of 24 typically developing monolingual Lithuanian children from middle-class families, attending a state kindergarten. During the experiment, the children were asked to tell a story according to the picture sequence. After transcription of audio-recorded stories, production of mazes was measured automatically by using CHILDES tools; the obtained data was compared to the main microstructural indications such as story productivity and syntactic complexity using SPSS tools.

During the investigation, statistically significant positive correlation ($p < 0.05$) between hesitations and revisions was found. However, production of mazes cannot be related to either story productivity (namely, story length in CU) or to syntactic complexity (namely, CL/CU ratio).

Index Terms: linguistic disfluency, mazes, narrative

1. Introduction

Speech disfluency can generally be distinguished as being either stuttering or linguistic disfluency [1]. The second one, also called mazes [2], can be divided into categories such as *hesitations, fillers, repetitions, and revisions* [3]. Despite the fact that all children demonstrate linguistic disfluency [4], language impaired (LI) children tend to produce more mazes than do typically developing (TD) children [5], thus general number and proportions of linguistic disfluencies can potentially indicate language impairment and help to distinguish between TD and LI children. However, linguistic disfluency in children has not been widely investigated [6]; moreover, previous studies have been based mainly on English language data. Thus we still need more comprehensive studies based on other languages in order to develop (cross-) linguistic profile for TD vs. LI children from the perspective of language fluency.

The current study focuses on the production of mazes in Lithuanian monolingual TD 6-year olds. During the investigation, hesitations, repetitions, and revisions observed in the narrative speech were analyzed. While various models and methods for analyzing children's linguistic competency have been developed, narrative analysis has been applied in many studies for a number of reasons. Following Hayward and Schneider [7], narratives "constitute instances of language in use rather than in isolated component out of context; they are an integral part of everyday social interactions and the school curriculum". The narratives are "typically monologues that have a recognizable beginning and end, thus are relatively easy units to identify; they are also familiar to people of all ages, excepting only infants and toddlers" [8]; finally, narrative "play a critical role in the development of discourse, literacy, and socialization abilities" [9]. All-in-all "one can hardly underestimate the role of narrative skills in general

language proficiency and in a proper functioning of an individual and a society" [10].

In this study, production of mazes was measured automatically by using CHILDES (Child Language Data Exchange System) [11] tools and the obtained data were supplemented by microstructural analysis [12]. The questions addressed in this study include:

1. What are the number and distribution of mazes in Lithuanian monolingual TD 6-years olds?
2. How is production of mazes related to the main microstructural indications such as story productivity and syntactic complexity?

2. Data and research methodology

The subjects of the study were 24 monolingual TD children (mean age 82 months) from middleclass families, attending state kindergarten in Kaunas (the second largest city in Lithuania). An equal number of boys and girls were selected from those children whose parents provided written permission for them to participate in the experiment.

A sample of preschoolers was selected for a number of reasons. First, preschool age is considered critical for the transition from oral to written communication, which appears to be crucial for the later development of literacy and academic attainment. There is evidence that children "who have not mastered the ability to produce adequate narratives when entering Grade 1 have difficulty in making the transition to written texts" [13] and consequently have more difficulties in learning both languages and other subjects. Thus narrative and general language skills at preschool age should be investigated in order to indicate the linguistic profile of this age group and to identify children who need language therapy or a help in learning the written language.

A visual stimuli, namely, picture sequence, the *Cat Story* (developed by M. Hickmann [14], was selected for eliciting children's narratives. The sequence consists of six black-and white pictures (10 x 13 cm), without a text. There are four protagonists in the sequence: a mother bird, baby birds, a cat, and a dog.

An experimenter tested each child individually, in a quiet room in their kindergarten. First, for warming-up, each child was asked, whether he/she likes fairy-tales and stories, who tells stories to him/her, and then the experimenter said: "Today I would like *you* to tell me a story." The experimenter took the pictures and continued: "This is a story in these pictures. First I'll show you all pictures, and then you look at the pictures carefully and tell me the story you see." Then the experimenter placed the pictures in the correct sequence in a single row in front of the child, without saying anything except, "The story starts like this...". The child was allowed to look at the pictures for a minute or two to get the gist of the story. Then the experimenter said: "Now I want you to tell the story. This is the beginning of the story. Look at the pictures and try to

tell *the best story you can*.” No questions such as “What is he/she doing here?”; “What is this?”, etc., were used in order not to disrupt or influence the child’s narration. Allowable prompts, if the child was hesitant to continue, were, “Tell me a story about what happens in this picture” or “Tell me what happened”.

All the stories were audio-recorded, transcribed and coded according to CHILDES CLAN tools for automatic analysis of the mazes and the main microstructural indications.

During the analysis, all the mazes were grouped into hesitations, repetitions, and revisions. Individual numbers and distributions were indicated and compared within a sample. The main microstructural indications, namely, story length in communication units (CU)ⁱ and CL/CU ratioⁱⁱ [15] were analyzed and compared to the production of mazes.

ⁱ Communication unit – “independent clause with its modifiers” [2: 9].

ⁱⁱ CL/CU ratio – mean number of clauses per CU.

3. Results and discussion

The findings indicate that TD children produced all types of mazes in the stories (see Fig. 1). In total, 181 mazes were observed in the stories. The majority of them (64%) can be identified as hesitations, while repetitions (25%) and revisions (11%) were much rarer. These findings confirm a prediction that filled pauses, incomplete phrases, and repetitions are more immature disfluencies, while other types of disfluencies are more characteristic at the later stages of language acquisition [16].

Proportions of different types of mazes seem to be rather individual than universal, e.g., in the speech of a few subjects, only hesitations were observed, while other subjects produced two or three types of mazes (but the proportions still were different). However, statistically significant positive correlation ($p < 0.05$) between hesitations and revisions was found, i.e. hesitations were followed/ supplemented by revisions rather than repetitions.

3.1. Hesitations

Hesitations (see Fig. 2) can be described as (1) silent (unfilled) or (2) filled pauses (also called *fillers*) involving the articulation of some sound during the delay [17], e.g.,

(1) *Lipo katē # ģ lizdā.*

‘The cat climbed to [PAUSE] a nest.’

(2) *Pribēgo prie jos ir sako: prašau, # mmm # gražioji šarka!*

‘[The cat] came to her and said: please, [PAUSE-FILLER-PAUSE] you beautiful magpie!’

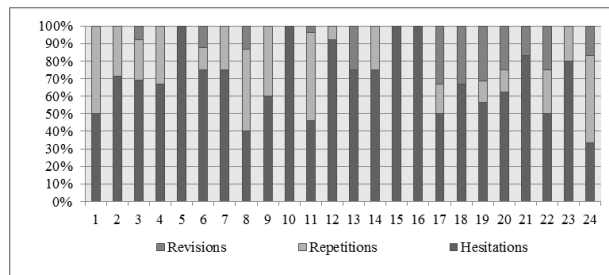


Figure 1: Distribution of mazes.

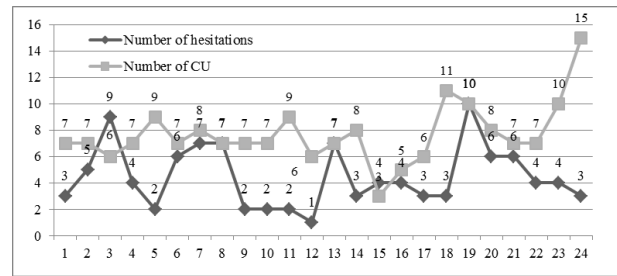


Figure 2: Distribution of hesitations.

The children tended to use silent pauses (72%), while filled pauses were much rarer (28%).

The filler may resemble an actual word (3) or be a non-lexical formation (4), e.g.,

(3) *Paskui # nu # šuo patempē katē.*

‘Then [PAUSE] well-FILLER [PAUSE] the dog pulled the cat.’

(4) *Vienā kartā # eee # paukštis tupējo lizdē.*

‘Once upon a time [PAUSE-FILLER-PAUSE] a bird was sitting in his nest.’

The majority of the fillers could be identified as non-lexical units, whereas only a few of them (6 of 32) were actual words.

Following previous researches [18], fillers “are most likely to occur at the beginning of an utterance or phrase, presumably as a consequence of the greater demand on planning processes at these junctures”. However, in our study, the majority (111 of 116) of hesitations occurred within a CU. Although we still need more data and comprehensive studies, one can observe that children tend to hesitate before object naming, e.g.

(5) *Katinas pamatē # mmm # tuos paukščiukus.*

‘The cat saw [PAUSE-FILLER-PAUSE] the baby birds.’

(6) *Paukštē parskrīdo ir davē vaikams # eee # eee # kirminēļ.*

‘The mother bird came back and gave [PAUSE-FILLER-PAUSE-FILLER-PAUSE] a worm to her children.’

This presumably can be related to vocabulary limitations and its influence on the speech planning processes.

3.2. Repetitions

Repetitions (see Fig. 3) can be grouped into repeated (7) phrases, (8) words and (9) parts of word.

(7) *Paskui katytē užlipo ant šakos, ir katytei už uodegos # ir katytei už uodegos šuo tampe.*

‘Then the cat climbed the branch, but the dog pulled cat’s-tail-PAUSE-but the dog pulled cat’s-tail.’

(8) *Mama savo # savo vaikams valgyt atnešē.*

‘Mother bird brought some food for her-PAUSE-her children.’

(9) *Katē pamatē, kad ma # mama išskrido paukščiuku.*

‘The cat saw that the mother:INCOMPLETE-PAUSE-mother flew away.’

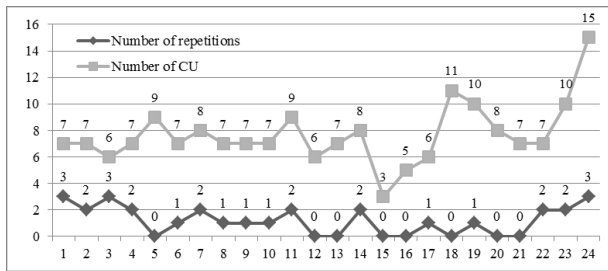


Figure 3: Distribution of repetitions.

Following the results, repeated words (44%) and parts of word (40%) are much more frequent in comparison to repeated phrases (16%). Among the repeated words, conjunctions (*ir* ‘and’, *o* ‘and’) and discourse markers (such as *tada* ‘then’ or *tai* ‘so’) were dominant.

3.3. Revisions

Revisions can be classified as (10) phonological, (11) lexical, and (12) grammatical modifications of speech.

(10) *Š # šuo patraukė jai už uodegos.*

‘The dog-PAUSE-dog pulled her tail.’

(11) *Varna pribėgo [//] # priskrido prie katės.*

‘The crow ran-PAUSE-flied to the cat.’

(12) *Šuo pamatė katę ir tempė # pradėjo tempti už uodegos.*

‘The dog saw the cat and pull-PAUSE-started pulling the tail.’

After analysis it can be stated that lexical revisions (45%) are dominant among all the revisions, while grammatical (35%) and phonological (20%) revisions are rarer.

As it was mentioned above, statistically significant positive correlation ($p < 0.05$) between hesitations and revisions was found. Nevertheless, comparison between revisions and repetitions did not show any statistically significant correlation.

Moreover, production of mazes did not correlate to either story length in CU or to CL/CU ratio. These findings disconfirmed expectation that hesitations occur rather in more productive stories or syntactically complex phrases. Naturally, relatively more hesitations were observed in the longer stories than in the brief ones, but the difference was not significant statistically.

The results lead to a probability that generally production of mazes is rather individual than universal characteristics, at least during the story-telling activity. However, a correlation between hesitations and revisions as well as the absence of correlation between production of mazes and microstructural characteristics (namely, story productivity and syntactic complexity) should be taken into account when developing linguistic profile of TD monolingual children.

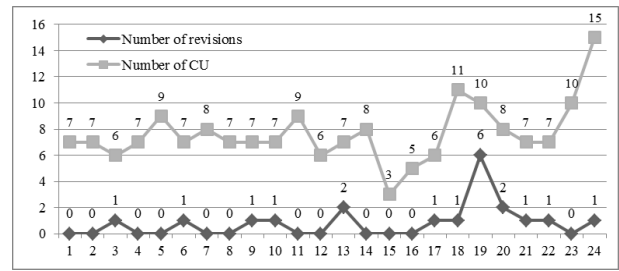


Figure 4: Distribution of revisions.

4. Conclusions

The study highlighted the main tendencies of narrative speech disfluencies in Lithuanian monolingual TD 6-year olds.

During the investigation, statistically significant positive correlation ($p < 0.05$) between hesitations and revisions was found. However, production of mazes cannot be related to either story productivity (namely, story length in CU) or to syntactic complexity (namely, CL/CU ratio) and seems to be rather individual than universal characteristic. Naturally, the results of the study have to be verified by more comprehensive research, thus further studies will include adult, LI and bilingual samples.

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