DURATIONAL PATTERNS AND FUNCTIONS OF DISFLUENT WORD-REPETITIONS: THE EFFECT OF AGE AND SPEECH TASK

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Abstract
The aim of this study is to analyse durational patterns and functions of disfluent whole-word repetitions in diverse age groups and speech tasks. Speech samples of school children (9-year-olds), adolescents (13-14-year-olds), young adults (20-25-year-olds) and old speakers (75+) were selected for the analysis. Recordings were made with each subject in two situations representing different speech tasks: 1) spontaneous narrative (participants spoke about their own lives and families), and 2) narrative recall (the task was to recall two texts they had listened to as accurately as possible). Results show that there are differences in the durational patterns and functions between the age groups in both speech tasks. Editing phases were significantly longer in 9-year-olds than in adults. In the ratio of the duration of R2 and R1, there were significant differences between 9-year-olds and the other three age groups, and between adolescents and the old speakers. As regards functions, in spontaneous narratives, the ratio of canonical repetitions was higher in 13- and 20-30-year-olds, and the ratio of stalling repetitions was higher in 9- and 75+-year-olds. In narrative recall, the ratio of stalling repetitions rose in 20-30- and 75+-year-olds. However, there were no significant differences between the speech tasks in any age group.

Keywords: whole-word repetition, durational patterns, function, speakers' age, speech task

1 Introduction

In spontaneous speech, one of the most frequent types of disfluency is word-repetition (Shriberg, 1995) that may stem from word-finding problems, difficulties in conceptual planning, or covert self-monitoring (Plauché & Shriberg, 1999). Word repetitions are considered disfluencies when the repeated word occurs due to speech planning and production problems. A repeated word is not considered disfluent when it occurs intentionally for emphasis or for pragmatic or stylistic reasons (Lickley, 2015). The differentiation of the two types of repetition (disfluency or pragmatic/stylistic role) is also supported by context and suprasegmental structure (intonation, speech rate and/or emphasis).

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Repetitions consist of several parts: the original utterance, the first instance of the repeated word (R1), the second instance of the repeated word (R2) and the continuation of the utterance. Optional pauses may also occur next to the main parts: before the first instance (P1), between the two instances (P2, editing phase) and after the second instance (P3) (Plauché and Shriberg 1999). Example (1) shows the main parts of a disfluent whole-word repetition (SIL = silent pause):

(1)	There is a book	SIL	on	SIL	on	SIL	the table.
	Original utterance	P1	R1	P2	R2	P3	Continuation

The phonetic characteristics of R1 and R2 were analysed in several studies (Shriberg, 1999, 2001; Gyarmathy, 2009; Bóna, 2010). It was found that as regards durations, R1 and R2 can be realised in three different ways: (i) R1 is longer than R2; (ii) R2 is longer than R1; or (iii) the duration of R1 and R2 is similar. The last case is quite rare while the first one is the most frequent. For example, in English, repetitions of the article *the* were analysed. In this case, R1 was significantly longer than R2. The duration of R2 was similar to the duration of the article occurring in fluent speech (Shriberg, 1999). Based on these data, it was concluded that speakers try to avoid silent or filled pauses. They make an effort to keep their speech fluent by lengthening R1 (Shriberg, 1999). In Gyarmathy's study (2009), R1 was longer in 71.95% of all repetitions. Considering all repetitions, there was significant difference in duration between R1 and R2. In addition to duration, f0 and formants of vowels were also analysed (Shriberg, 1999; Gyarmathy, 2009). Results showed that there was no significant difference in these parameters. This proves that R1 and R2 are parts of a single phonetic plan (Gyarmathy, 2009).

The duration of the first and second instances of the repeated words and the occurrence of pauses are related to the function of the repetitions. Heike (1981) defines two functions of disfluent whole-word repetitions: (i) R2 is the hesitation in itself, in other words, it fills the gap caused by speech planning problems (prospective repeats); (ii) R2 is the bridge between original utterance and continuation (retrospective repeats). In this case, planning difficulties are solved during the pronunciation of R1. The two functions are characterized by pauses occurring before, between and after R1 and R2. In the first case, R2 is followed by a pause. In the second case, R2 is preceded by a pause but it is not followed by one. According to Shriberg (1995), the second type of repetitions is significantly more frequent than the first type. The duration of R1 and R2 and their ratio depend on the function of whole-word repetitions. If the repetition is prospective, R2 is longer than R1. If the repetition is retrospective, R1 is longer than R2. Plauché and Shriberg (1999) found three main types of functions: canonical repetition, covert self-repair, and stalling repetition (Table 1). Their categorization was based on the durational patterns of word-repetitions, but f0 variation and glottalization were also considered. The categorization of Plauché and Shriberg (1999) could be valid for any language, although they examined only *I* and *the*. Irrespective of which words are considered disfluent repetitions, distinctions can be made between the different functions.

In cases of canonical repetition (Plauché & Shriberg, 1999), the duration of R1 is much longer than in the utterance of the same word in fluent speech. The duration of R2 is similar to the fluent word. There might be a pause before R1, there is a long pause between R1 and R2, and there is no pause after R2. Both R1 and R2 are characterized by falling intonation, and R1 is often characterized by diplophonia and creak-like voicing modality (similar to a filled pause). In this case the speaker has difficulties during speech production, stops during the pronunciation of the word (R1), lengthens it, and after having solved the problem they continue speaking with repeating the last lengthened word. This type corresponds to Heike's retrospective repeat (1981).

In cases of covert self-repair (Plauché & Shriberg, 1999), P1 often occurs, but there is no P2 or P3. R1 and R2 are slightly longer than they are in fluent speech, and their durations are similar to each other. R1 and R2 are both characterized by rising pitch. R1 is sometimes pronounced with glottalization. In this case the speaker detects a problem during the pronunciation of R1; this is shown by a possible preceding pause and glottalization. The speaker makes an effort to correct it, and "R2 usually marks the beginning of a new utterance or a corrected version of the previous one" (Plauché & Shriberg, 1999, p. 1516).

In cases of stalling repetition (Plauché & Shriberg, 1999), there is no pause before R1, but P2 and P3 may occur. The duration of R1 is slightly longer than in fluent speech, and the duration of R2 is much longer. R1 is characterized by a drop in pitch. The speech is fluent during the pronunciation of R1, the speaker has a problem during and/or after the pronunciation of R2. This is usually marked by P3 or other possible disfluencies after R2. This type looks as if it was the inverse of canonical repetitions, and corresponds to Heike's prospective repeat (1981).

The categories of Plauché and Shriberg (1999) are determined by hierarchical clustering based on acoustic data. Out of the 819 whole-word repetitions analysed, 724 were distributed in these main categories. The remaining 95 occurrences were distributed across 32 other clusters.

The characteristics of repetitions (like other disfluencies) are influenced by several factors: for example, by the age of the speaker. DeJoy and Gregory (1985) found that in 3.5- and 5-year-old children's speech one of the most frequent disfluencies is whole-word repetition. 3.5-year-old children produce word-repetitions significantly more frequently than 5-year-olds. Similar results were found by Kowal et al. (1975). They found that the occurrence of word-repetitions fell to one-sixth between preschool- and secondary-school-age. In the speech of 6-7-year-old Hungarian speaking children, the ratio of word-repetitions was the highest (43%) among all disfluencies (it was even higher than the ratio of filled pauses – the latter was 16%) (Horváth, 2006). According to Neuberger (2014), word-repetition was the second most frequent disfluency-type in 6-year-olds' speech. However, above age 7, its ratio was only 3-14%. Bóna (2013) analysed word-repetitions in old speakers' speech. Her results show that the occurrence of word-repetitions is significantly less frequent in old speakers' speech than in young speakers' speech. Editing phases (P2) of old speakers were significantly shorter than those of young speakers. The ratio of zero editing phases was higher in old speakers' speech. Bóna and Vakula (2017) found that whole-word repetitions of content words are more frequent in children's and old speakers' speech and the occurrence of stalling repetition is more frequent in their case compared to young and middle-aged adults.

Table 1. The structures of the three types of word-repetitions (examples with 'the') '+' = a longer than fluent duration. ' - ' = no pause (based on Plauché and Shriberg 1999)

Type	Structure
Canonical repetition	(Original Utterance) (Possible Pause) the+++ (Long Pause) the (-) (Continuation)
Covert self-repair	(Original Utterance) (Often Pause) the+ (-) the+ (-) (Continuation)
Stalling repetition	(Original Utterance) (-) the+ (Possible Pause) the+++ (Possible Pause) (Continuation)

Speakers' age influences not only the frequency of disfluencies, but also temporal characteristics of speech. As children are getting older, speech rate accelerates, although this acceleration is non-linear (Walker & Archibald, 2006). The change of speech rate and articulation rate happens due to biological factors and learned skills. Biological factors are the neurologic and neuromotor maturation (Smith et al., 1983; Smith, 1992); learned skills are motor learning, semantic, lexical, phonological access, and motor programming and planning (Nip & Green, 2013; Redford, 2014). Working-memory performance and speech rate are also related to each other: the speech rate of older children is positively influenced by the increase in storage capacity of working-memory and the better functioning of long-term memory (Roodenrys et al., 1993; Henry, 1994).

Speech rate becomes slower in the elderly (e.g., Hartman & Danhauer, 1976; Ramig, 1983; Duchin & Mysak, 1987; Bóna, 2014). There are several reasons in the background of the differences in speech rate of speakers of different ages: hormonal, psychological, and cognitive changes (Rodríguez-Aranda & Jakobsen, 2011); the aging of the speech organs (Xue & Hao, 2003), and the deterioration of hearing (Chisolm et al., 2003). Durational patterns of disfluencies (such as repetitions) might be affected by all of these age-related changes in speech and articulation rates.

In addition to age, the speech task presumably also influences the occurrence of whole-word repetitions. This is due to the fact that the different speech tasks require different speech planning mechanisms. The differences of speech planning mechanisms in these speech tasks show up in temporal characteristics (the frequency and duration of pauses can show speech planning processes), too (Ramig, 1983; Duchin & Mysak, 1987; Jacewicz et al., 2010; Bóna, 2014; Redford, 2015). Comparisons of narratives and conversations show that there is significant difference in the frequency of disfluencies between the two speech tasks (Shriberg, 2005; Beke et al., 2014). Furthermore, there are differences in the occurrences of disfluencies between narratives with different topics (Roberts et al., 2009). In an analysis of Hungarian speech, the ratio of whole-word repetitions within all disfluencies was different in various speech tasks. The most frequent occurrence was found in narrative recall, and the less frequent in spontaneous narratives (Bóna, 2014).

The question is how speakers' age and the speech task influence the durational patterns and functions of disfluent whole-word repetitions. The aim of this study is to analyse durational patterns and functions of the repeated words in diverse age groups and speech tasks. The hypotheses of the research are: (i) there will be a difference in the durational patterns and functions of repetitions between the age groups in both speech tasks; (ii) there will be a significant difference between the speech tasks in the characteristics of repetitions in each age group.

2 Methods

For the analysis, speech recordings of 80 speakers were selected from two Hungarian speech databases. Speech samples of schoolchildren (9-year-olds), and adolescents (13-14-year-olds) were selected from GABI Hungarian Children Speech Database and Information Repository (Bóna et al., 2014). Speech samples of young adults (20-25-year-olds) and old speakers (75+) were selected from BEA Hungarian Speech Database (Gósy, 2012). In every age group there were 20 speakers (10 females and 10 males). They were native Hungarian speakers with normal hearing and without any known mental or speech disorders. They spoke standard Hungarian.

Recordings were made with each subject in two situations which represented different speech tasks: (i) spontaneous narrative, and (ii) narrative recall. In spontaneous narratives participants spoke about their own lives and families. They could speak freely and use words and grammatical forms of their own choice. In narrative recall, the task was to recall two texts they had listened to as accurately as possible. One was a science dissemination text, the other was a historical anecdote. The texts were the same in each age group. In this speech task, the success of recalls was determined by speech processing, attentional and working memory mechanisms, and narrative competence (Juncos-Rabadán and Pereiro 1999). Altogether about 8 hours of speech were analysed.

Disfluent whole-word repetitions were collected from the recordings. The analysis was not aimed at determining frequency of occurrence so instances per person were not calculated. Altogether 446 whole-word repetitions were analysed. The number of occurrences of whole-word repetitions depending on age and speech task is shown in Table 2.

Table 2. Number of occurrence of whole-word repetitions depending on age and speech task

	Spontaneous narratives	**Narrative recalls**
9-year-olds	32	17
13-year-olds	21	15
20-30-year-olds	160	57
75+-year-olds	94	50
All	307	139

The annotations and measurements (duration of the components of repetitions) were carried out by Praat (Figure 1). The first and second instances of the repeated word and the pauses between them were measured. We analysed the ratio of the second (R2) and the first (R1) instance of the repeated word and the pauses between and after them. This was needed because differently from Plauché and Shriberg (1999), in this analysis every disfluently repeated word was examined. This means that not only *én* 'I' and the definite article *a, az* 'the' were analysed, but also other disfluently repeated function words (e.g. conjunctions) or content words. The difficulty was caused by the fact that participants did not repeat the same words in each age group and in both speech tasks. So the comparison of the raw duration of R1 and R2 was not possible. In addition, this method (comparing the ratio of R2 and R1) also allowed us to eliminate the influence of the differences in articulation rate.

Pauses before the first instance and after the second instance of the repeated words were not measured, but their occurrences were considered for the examination of functions. Functions were determined on the basis of the durational patterns of R1 and R2, and the occurrence of pauses. The categorization was supported also by the perceived intonation (falling or rising) and voicing features (glottalized or not) (based on Plauché & Shriberg, 1999; see Table 1). According to the above types, the analysed whole-word repetitions were categorized in four groups: (i) canonical repetitions, (ii) covert self-repairs, (iii) stalling repetitions, (iv) other (the cases which could not be categorized in the main types). The group of multiple repetitions which contains cases where the first instance of the word is repeated more than once was not analysed. Types of the repeated words (content word or function word) were also determined. The measurements and classifications were carried out by the two authors independently. After that, 10% of the data was reanalysed by the other author. The results of the two analyses were similar in 100% of the cases.

Statistical analysis (Wilcoxon Signed Ranks Test, Mann–Whitney-test, repeated measures ANOVA) was carried out by SPSS on 95% confidence level.

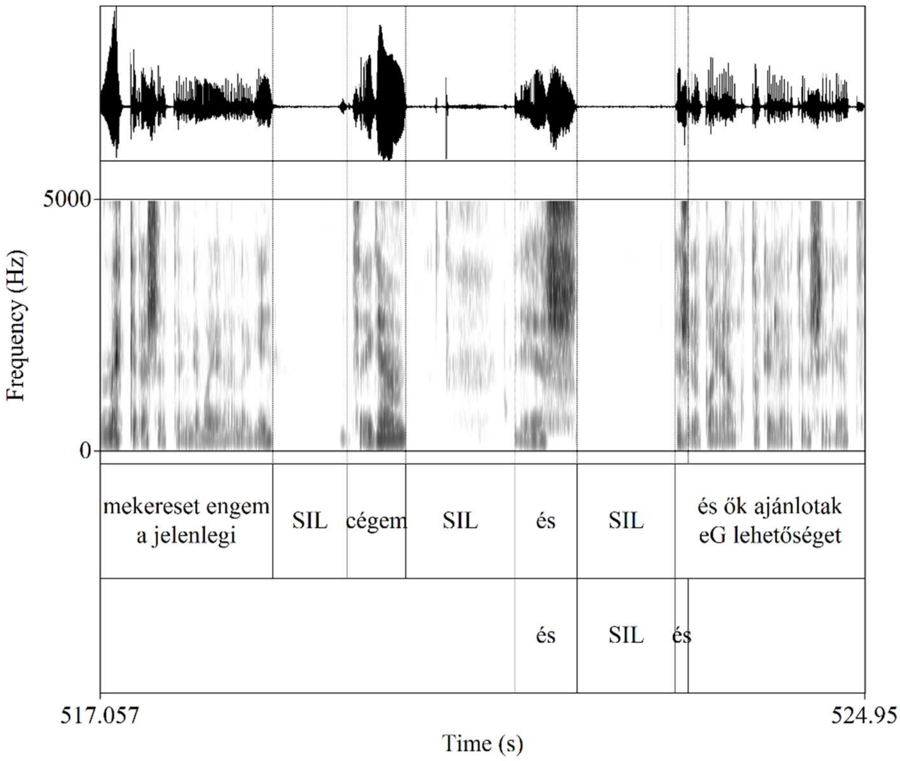

Figure 1.
Example for the annotation by Praat (SIL = silent pause)

3 Results

First, types of the repeated words were determined (Figure 2). In each age group, function words were repeated in a higher ratio than content words were. However, the ratio of repeated content words was much higher in 9-year-olds and 13-year-olds than in 20-30- and 75+-year-olds. In addition, 75+-year-olds produced twice as high a ratio of repetitions of content words than 20-30-year olds. In addition to age, speech tasks also influenced the ratio of the repetitions of content words. Their ratio was higher in spontaneous speech in all four age groups. The biggest difference between the two speech tasks appeared in 9-year-olds: the appearance of repeated content words was 28.1% in spontaneous speech and 17.6% in narrative recall. The smallest difference between the two speech tasks appeared in young adults: it was only 0.25 percentage points. The ratio of repeated content words in the case of young adults was 3.75% in spontaneous speech and 3.5% in narrative recall.

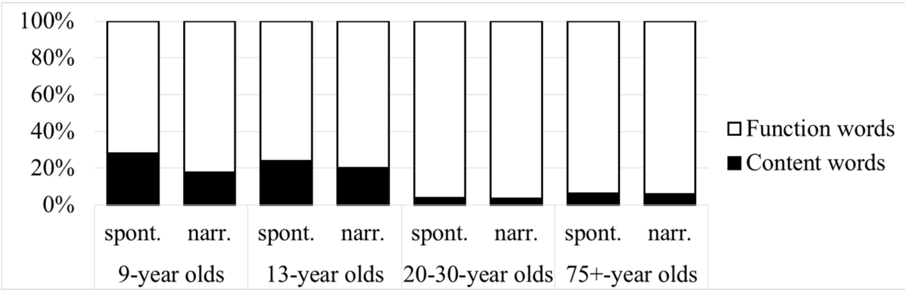

Figure 2.
The ratio of content words and function words
(spont. = spontaneous speech, narr. = narrative recall)

The duration of R1 and R2 was analysed in all repetitions (Table 3). In the case of 9-year-olds, there was no significant difference between R1 and R2 in spontaneous speech. However, there was significant difference in narrative recall [repeated measures ANOVA: $F(1, 16) = 15.673$, $p = 0.001$, $\eta^2 = 0.495$]. In the case of 13-year-olds, there were significant differences between the durations of R1 and R2 in spontaneous speech [repeated measures ANOVA: $F(1, 20) = 28.755$, $p < 0.001$, $\eta^2 = 0.590$] and in narrative recall (Wilcoxon Signed Ranks Test: $Z = -3.294$, $p = 0.001$). In the case of 20-30-year-olds, there were signify-cant differences between R1 and R2 in spontaneous speech [repeated measures ANOVA: $F(1, 159) = 91.871$, $p < 0.001$, $\eta^2 = 0.366$] and in narrative recall (Wilcoxon Signed Ranks Test $Z = -3.869$, $p < 0.001$). In the case of 75+-year-olds, there was no significant difference between R1 and R2 in any speech task.

Table 3. Duration of R1 and R2 depending on age and speech task (ms)
(Mean ± Standard Deviation)

	Spontaneous narratives		**Narrative recalls**	
	R1	**R2**	**R1**	**R2**
9-year-olds	430±199	378±212	582±256	418±189
13-year-olds	448±179	255±113	600±328	377±202
20-30-year-olds	344±144	232±109	349±149	268±185
75+-year-olds	362±237	334±181	265±159	272±200

To be able to compare how the duration of R1 and R2 relate to each other across age groups and speech tasks, the ratio of R2 and R1 was calculated (Figure 3). If the ratio was less than 100%, R1 was longer than R2. If the ratio was more than 100%, then R2 was longer than R1. In the case of adolescents and young adults, the majority of the values were below 100%. In the case of schoolchildren and old speakers, the majority of the values were over 100%. The ratio of R2 and R1 was 92±9.1% in schoolchildren's spontaneous narratives, and 74±5.2% in their narrative recalls. It was 63±6.5% in adolescents' spontaneous narratives, 67±5.3% in their narrative recalls. 75±3.2% in young adults' spontaneous narratives, 80±6.8% in their narrative recalls. 107±6.3% in the old speakers' spontaneous narratives, 110±7.1% in their narrative recalls. Table 4 shows the significant differences as results of the statistical analysis. There were no significant differences between 20-30-year-olds and 13-year-olds, and between 20-30-year-olds and 75+-year-olds, in any speech tasks.

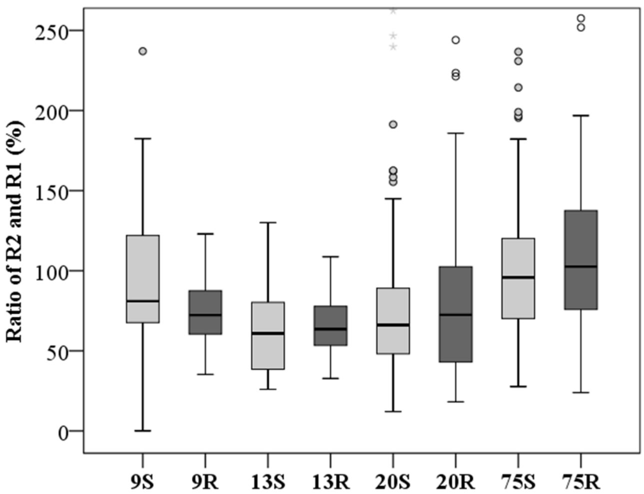

Figure 3.
Ratio of the durations of R2 and R1
(R2 = duration of the second instance of the repeated word, R1 = duration of the first instance of the repeated word, S = spontaneous speech, R = narrative recall)

Table 4. Significant differences between the age groups in the ratio of R2 and R1 (Results of the Mann–Whitney-test)

	Spontaneous narratives		Narrative recalls	
	Z	*p*	*Z*	*p*
9- and 13-year-olds	−2.237	0.025	–	–
9- and 20-30-year-olds	−2.805	0.005	−2.531	0.011
9- and 75+-year-olds	−2.365	0.018	−2.662	0.008
13- and 75+-year-olds	−3.866	< 0.001	−3.519	< 0.001

Editing phases (P2) of all repetitions were also analysed (Figure 4). The longest editing phases were produced by 9-year-olds. According to the statistical analysis, there were significant differences between 9-year-olds and 20-30-year-olds (Mann–Whitney-test, spontaneous narratives: $Z = -2.805$, $p = 0.005$; narrative recalls: $Z = -2.531$, $p = 0.011$) and between 9-year-olds and 75+-year-olds (Mann–Whitney-test, spontaneous narratives: $Z = -2.365$, $p = 0.018$; narrative recalls: $Z = -2.662$, $p = 0.008$) in the duration of editing phases in the two speech tasks. There was no significant difference between the two speech tasks in any of the age groups.

The majority of editing phases was realized as silent pause in each age group and in both speech tasks. In 20-30-year-olds and 75+-year-olds, the ratio of silent editing phases was higher than in the other two age groups (Figure 5).

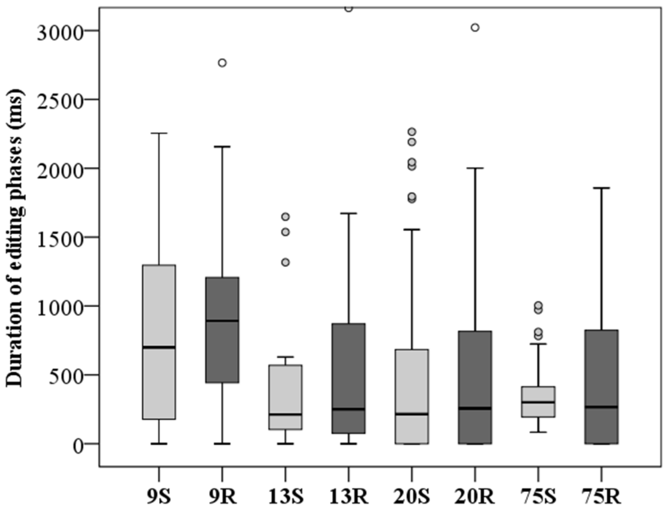

Figure 4.
Duration of editing phases of every repetition
(S = spontaneous speech, R = narrative recall)

The functions of repetitions were also analysed (Figure 6). Schoolchildren and adolescents produced canonical repetitions in higher ratio than the other two age groups. In the old speakers' speech, stalling repetitions and "other types" occurred in a much higher ratio than in the other groups. Covert self-repairs occurred in the highest ratio in 20-30-year-olds' spontaneous narratives. In the comparison of speech tasks, the ratio of canonical repetitions was higher, and the ratio of covert self-repairs was lower in narrative recall than in spontaneous narrative, in each age group.

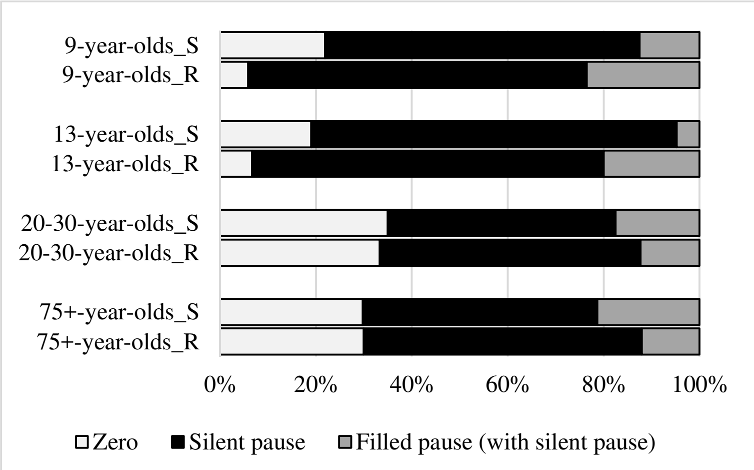

Figure 5.
Types of editing phases (P2)
(S = spontaneous speech, R = narrative recall)

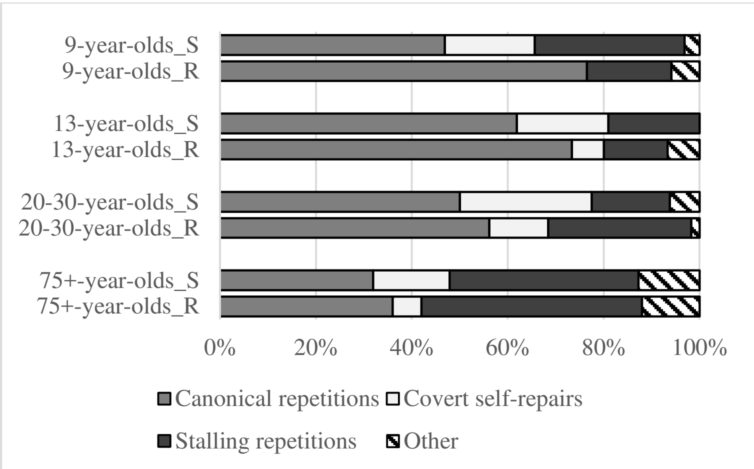

Figure 6.
Functions of repetitions
(S = spontaneous speech, R = narrative recall)

The ratio of R2 and R1 and editing phases (P2) depending on types of functions of repetitions were also analysed. According to the statistical analysis, in cases of covert self-monitoring, there were no significant differences in the ratio of R2 and R1 between any age groups and any speech tasks (in this case, the editing phase was always 0 ms).

Results of canonical repetitions are shown in Table 5. According to the statistical analysis, in spontaneous narratives, there was significant difference in the ratio of R2 and R1 between 20-30-year-olds and 75+-year-olds (UniANOVA: $F(3, 134) = 4.268$, $p = 0.007$; $\eta^2 = 0.087$; Tukey's post hoc test: $p = 0.003$). In narrative recalls, there was a significant difference also between 20-30-year-olds and 75+-year-olds in the ratio of R2 and R1 (UniANOVA: $F(3, 71) = 5.329$, $p = 0.002$, $\eta^2 = 0.186$; Tukey's post hoc test: $p = 0.006$). There were no significant differences between the two speech tasks.

Table 5. Ratio of R2 and R1 and duration of editing phases of canonical repetitions (mean±SD)

	Ratio of R2 and R1 (%)		**Duration of editing phases (ms)**	
	Spontaneous narratives	**Narrative recalls**	**Spontaneous narratives**	**Narrative recalls**
9-year-olds	58±8.6	70±4.7	1421±313	1191±489
13-year-olds	53±6.4	68±7.2	630±148	318±114
20-30-year-olds	53±2.1	50±3.6	636±60	730±177
75+-year-olds	69±4.2	72±6.3	607±158	758±141

As regards editing phases, in spontaneous narratives, there were significant differences between 9-year-olds and 13-year-olds (Mann–Whitney-test: $Z = -2.326$, $p = 0.020$), 9-year-olds and 20-year-olds ($Z = -3.041$, $p = 0.002$), and 9-year-olds and 75+-year-olds ($Z = -3.226$, $p = 0.001$). In editing phases, in narrative recall, there were significant differences between 13-year-olds and 9-year-olds (Mann–Whitney-test: $Z = -2.231$, $p = 0.026$), and 13-year-olds and 75+-year-olds ($Z = -2.247$, $p = 0.025$). There was no significant difference between the two speech tasks.

In case of stalling repetitions, in 9-year-olds and 13-year-olds there were so few data available that these two age groups could not be included in the statistical analysis. There was a significant difference between 20-30-year-olds and 75+-year-olds only in the ratio of R2 and R1, and only in spontaneous narratives ($Z = -2.164$, $p = 0.030$). In editing phases, and between the two speech tasks, there were no significant differences in any age groups.

4 Discussion and conclusion

In this paper durational patterns and functions of disfluent whole-word repetitions were analysed in four age groups and in two speech tasks. Results show that children, adolescents and old speakers repeat content words in much higher ratios than young adults do. This might mean that the former have more serious word retrieval or speech-planning and monitoring problems than the latter. This assumption is supported by the fact that in narrative recall, the ratio of repetitions of content words was reduced. Namely, in the case of narrative recall, it is not the speaker who has to select the appropriate word from their vocabulary, since they already heard the words and grammatical forms of the story before they were asked to retell it.

As regards durational patterns of all repetitions, there were significant differences between the age groups, but not between the speech tasks. In editing phases, there were significant differences between 9-year-olds and the two adult groups. It seems as if adolescents formed a transition between schoolchildren and adults in this respect. Editing phases were significantly longer in 9-year-olds than in adults. On the one hand, they might have needed more time for solving the planning difficulties. On the other hand, they might not have felt the need to fill the gap as soon as possible with pronouncing the second instance of the repeated word (R2) during solving the speech-planning difficulties. In the ratio of the duration of R2 and R1, there were significant differences between 9-year-olds and the other three age groups, and between adolescents and old speakers. The smallest ratio of the duration of R2 and R1 was in adolescents in both speech tasks. This means that they pronounced R2 much shorter compared to R1 than the other groups. The ratio of the duration of R2 and R1 was over 100% in the case of old speakers. This means that they pronounced R2 longer than R1.

These durational patterns show the differences between the groups in the distribution of functions of whole-word repetitions. In spontaneous narratives, the ratio of canonical repetitions was higher in 13- and 20-30-year-olds, and the ratio of stalling repetitions was higher in 9- and 75+-year-olds. This shows bigger speech-planning difficulties in the latter groups. In the comparison of speech tasks, it seems that in narrative recall, repetitions in the function of covert self-repair occurred rarely in each age group. In narrative recall, the ratio of stalling repetitions rose in 20-30- and 75+-year-olds. This means that they have more speech-planning problems in this speech task or they realize them later because it was necessary for them to remember the story. The rise of the ratio of canonical repetitions in 9- and 13-year-olds might be caused by the decrease of the ratio of covert self-repair in narrative recall.

In the comparison of the durational patterns depending on functions, the results were similar to the comparison of the durational patterns of all repetitions. In case of canonical repetitions, 9-year-olds' data were the most divergent from the other age groups. Covert self-repair was similar in each age group. In case of stalling repetitions, only the two adult groups were comparable and they were mostly similar. There were no significant differences between the speech tasks in the durational patterns in any of the three functions.

Results show that the first hypothesis was confirmed: there are differences in the durational patterns (duration of the repeated words and pauses) and functions between the age groups in both speech tasks. The second hypothesis was not confirmed: there was no significant difference between the speech tasks in any age group. The speech task can influence the ratio of the different functions of disfluent word-repetitions, but the ratio of the repeated words and the duration of editing phases were similar in both speech tasks.

The differences between age groups in the distribution of functions of whole-word repetitions indicate that in different age groups not only the frequency of disfluencies, but also their functions may indicate different speech planning strategies and difficulties. It would be worth examining the functions (not only the frequency) of certain other types of disfluency, too.

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