DISFLUENCIES AND DISFLUENCY CLUSTERS IN CLUTTERED, STUTTERED AND TYPICAL SPEECH

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Introduction

Cluttering and stuttering are fluency disorders which can appear separately or together, too. Cluttering "is a fluency disorder wherein segments of conversation in the speaker's native language typically are perceived as too fast overall, too irregular, or both. The segments of rapid and/or irregular speech rate must further be accompanied by one or more of the following: (a) excessive 'normal' disfluencies; (b) excessive collapsing or deletion of syllables; and/or (c) abnormal pauses, syllable stress, or speech rhythm" (St. Louis–Schulte 2011: 241-242). According to one of the most widely used definition from a behavioral standpoint (Wingate 1964: 488), stuttering is a "(a) Disruption in the fluency of verbal expression, which is (b) characterized by involuntary, audible or silent, repetitions or prolongations in the utterance of short speech elements, namely: sounds, syllables, and words of one syllable. These disruptions (c) usually occur frequently or are marked in character and (d) are not readily controllable." The definition of the World Health Organization listing (2016) is similar: "Speech that is characterized by frequent repetition or prolongation of sounds or syllables or words, or by frequent hesitations or pauses that disrupt the rhythmic flow of speech. It should be classified as a disorder only if its severity is such as to markedly disturb the fluency of speech". (ICD 10, 98.5)

Although, according to the Lowest Common Denominator definition (St. Louis–Schulte 2011: 241–242), cluttering can be characterized by excessive disfluencies, there are only a few papers about the types, characteristics, and the frequency of disfluencies in cluttered speech. These papers (St. Louis et al. 1985; Myers–St. Louis 1996; Van Zaalen et al. 2009a; Oliveira et al. 2010; Myers et al. 2012) compare disfluencies in cluttering with those in stuttering or in typical speech. Namely, the examination of the occurrences of disfluencies might be applicable in the differential diagnosis between cluttering and stuttering (Myers et al. 2012).

Disfluencies occur in the speech of typical speakers, too (Levelt 1989; Lickley 2015). Typical speech and fluency disorders might be distinguished from each other by the frequency and types of disfluencies. In addition, com-

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paring typical speech and fluency disorders, there might be differences in speech rate as well. Speech rate in cluttering might be faster (Bakker et al. 2011), while in stuttering slower (Andrade et al. 2003) than in typical speech. However, there are differences in the disfluencies of cluttering and stuttering, too. According to the speech therapy literature, there are two main types of disfluencies: typical and stuttering-like disfluencies. Both types could occur in the speech of every speaker: there are stuttering-like disfluencies in typical speech and typical disfluencies in stuttered speech (Tetnowski–Scott 2010). The difference between the two types of speech is in the incidence rate. In English, the most frequent disfluencies are the same in cluttering and typical speech (Myers et al. 2012). The rate of stuttering-like disfluencies in cluttered and typical speech is only 2-3% (Myers et al. 2012). In stuttering, the occurrence of disfluencies is more frequent and most of them are stuttering-like (Tetnowski and Scott (2010). Table 1 shows the types of disfluencies with regards to indication whether they are stuttering-like or typical.

9. Table 1: Types of disfluencies based on Roberts et al. (2009) and Tetnowski and Scott (2010)

Disfluency type	**Definition**	**Example**	**Typical or stuttering-like disfluency**
Interjection	Any sound, syllable or extraneous word which does not contribute in meaning to the sentence.	The most frequent filler words in English: ***well, like, you know***. The most frequent filler sounds: ***um, uh.***	Typical disfluency
Part-word repetition	A sound or syllable said more than once with no additional meaning.	*I've been playing* ***p-p-p-p****-piano for a long time.*	Stuttering-like
Word repetition	A word said more than once with no additional meaning.	*There is a book on* ***the the*** *table.*	Typical disfluency (The repetition of one-syllable words are considered as stuttering-like in further studies. However, it is mostly typical in adult speakers' speech.)
Phrase repetition	More than one word said more than once with no	***I think I think*** *you are right.*	Typical disfluency

	additional meaning.		
Revision	Instances when the speaker corrects an error.	*I see **the hor- the dog**.*	Typical disfluency
Incomplete phrase	The speaker begins but does not complete an utterance.	***He is-** oh I forgot where he works.*	Typical disfluency
Broken word	A pause within the word.	*I **for**[pause]**got** his name.*	Stuttering-like (In agglutinative languages like Hungarian, broken word might be typical disfluency. The pause within the word might show e.g. difficulty in linguistic formulation, if the pause occurs between the root of the word and the suffix, Gósy 2012a.)
Prolonged sounds	Any sounds considered longer than normal.	***Sssssssssss**ummer was too hot.*	Stuttering-like
Tense pause (block, stoppage, fixation)	There are inaudible or hardly audible manifestations of muscular tension or tense articulatory contact between words, part-words, non-words.	… [pause with tension] I saw.	Stuttering-like

As regards to frequency, Oliveira et al. (2010) when analysing the speech of Brazilian Portuguese speakers, found that persons who clutter (PWC) produce twice as many disfluencies than typical speakers. This was typical of the case of both stuttering-like and other disfluencies. They found more than twice as many interjections, revisions and unfinished words, and seven times more word repetitions in the speech of PWC than in that of the typical speakers. However, Bakker et al. (2011), Myers et al. (2012), and Bóna (2016) found that there are not any significant differences between PWC and typical speakers when examining the frequency of disfluencies. Myers et al. (2012) analysed the occurrence and types of single disfluencies and disfluency clusters. Comparing the speech of PWC and typical speakers, they did not find any differences in either the frequency, or the most frequent types of disflu-

encies. There was significant difference between the two groups only in the occurrence of revisions in clusters and word repetitions in clusters. It may occur that in certain speech tasks (for example in rhetorical speech in front of audience, Bóna 2012), typical speakers produce more disfluencies than PWC.

Van Zaalen et al. (2009a) found that the speech task largely determines the proportion of typical and stuttering-like disfluencies. They assumed that PWC do not have enough time for speech planning which causes the occurrence of disfluencies in cluttering (van Zaalen et al. 2009b). This is also proven by the fact that when they slow down their own speech, less disfluencies occur (Bóna 2012). According to the Cluttering Spectrum Hypothesis (Ward 2006) there is a big overlap between the characteristic features of typical and PWC's speech. Typical speakers might produce symptoms of cluttering, too. Since cluttering is a multidimensional disorder, there are other factors (fast or irregular speech rate, poor speech intelligibility, inappropriate prosody etc.) in addition to the frequency of disfluencies which might influence its perception. The occurrence of excessive disfluencies is a possible but not obligatory characteristic feature of cluttering (St. Louis–Schulte 2011: 241–242; Myers et al. 2012).

There are various explanations for the occurrence of disfluencies in stuttering. On the one hand, stuttering-like disfluencies are disfluencies which appear on the motoric level (Ward 2006). This means that the speaker knows what they want to say but disruptions are in the motoric sequencing of sounds and syllables. According to the Covert Repair Hypothesis (Postma–Kolk 1993) people who stutter (PWS) have weak phonological encoding. This is why there are many disfluencies in their inner speech. The part-word repetitions in overt speech are consequences of covert self-monitoring. According to the Vicious Circle Hypothesis (Vasic–Wijnen 2001), PWS do not have weak phonological encoding. The problem is that PWS consider their own speech atypical. This is why the monitor becomes hypervigilant and this leads to excessive disfluencies.

Disfluencies often form clusters (Hubbard–Yairi 1988; LaSalle–Conture 1995). This means that two disfluencies appear in the same word or adjacently. Examples for two-elements disfluency clusters are the following (from LaSalle–Conture 1995): *I-l-l-you were going, I was I was um going.*

The frequency of disfluency clusters carries diagnostic value: it might show the severity of stuttering (Hubbard–Yairi 1988; LaSalle–Conture 1995) and cluttering (Myers et al. 2012). Analysing the speech of two PWC, Myers et al. (2008) found that PWC with more severe cluttering produced four times as many clusters as PWC with less severe cluttering. The types of disfluencies were not influenced by the severity of cluttering. The most frequent cluster constituents were interjections, revisions and unfinished words. Myers et al. (2012) compared the speech of 18 PWC and 20 typical speakers. Accord-

ing to their results, PWC produced much more disfluency clusters than typical speakers. However, the types of clusters were the same in both groups.

Occurrences of disfluency clusters were analysed in stuttering, too. According to the results of LaSalle and Conture (1995), children with stuttering (CWS) produced significantly more stuttering-stuttering clusters than other types. Typical children never produced stuttering-stuttering clusters. Stuttering-repair clusters (which contain a stuttering-like disfluency and a repair) occurred significantly more times in the speech of the former group. Repair-repair clusters (which contain two repairs) occurred more frequently in the speech of the latter group. Comparing the speech of adults who stutter (AWS) and the speech of CWS, the following difference was found: the ratio of disfluency clusters in the speech of CWS was more than half of all disfluency types (Hubbard–Yairi 1988; LaSalle–Conture 1995), while in the speech of AWS this ratio was no more than one third of the total number of disfluencies (Robb et al. 2009).

Disfluency clusters in which there are more than two disfluencies together, one right after the other, might also occur. These disfluency clusters are often called complex disfluencies. They are a series of disfluencies in succession (Shriberg 1994; Heeman et al. 2006; Robb et al. 2009; Gósy 2012c). Disfluency clusters containing more than two elements show bigger speech planning and production problems in both typical and atypical speakers.

There are many studies analysing the occurrence of disfluency clusters in stuttering, but there are only a few papers about disfluency clusters and disfluencies in general in cluttering. The aim of this paper is to examine the differences among cluttering, stuttering, and typical speech with regards to the frequency and types of disfluencies – both singletons and disfluency clusters. The frequency of complex disfluencies which contain more than two elements will be analysed, too.

According to the first hypotheses (1) the greatest difference will be between typical speakers and PWS in the frequency of the different types of disfluencies. (2) There will not be difference between typical speakers and PWC in the frequency of disfluencies. (3) PWS and PWC produce significantly more complex disfluencies than typical speakers.

Methodology

Participants

21 speakers participated in the study. There were 7 PWC, 7 PWS and 7 typical speakers. PWC were recruited by speech therapists for the study. Speech samples of PWS group were taken from the speech corpora of Bóna (2008), Gósy–Bóna (2011) and Kántor (2015). Control speakers were university students who participated in the recordings of BEA Hungarian Speech Database (Gósy 2012b). All participants volunteered for the tasks. Two experts in fluency disorders, a speech-language pathologist and a linguist spe-

cialized in fluency disorders, determined the diagnostic decisions independently of each other. They classified the speakers based on the recordings in three groups. Their rate of agreement was 100%.

In the group of PWC, speakers were aged between 20 and 32. There were 6 males and 1 female. All of them were native Hungarian speakers with normal hearing, and they had at least 14 years of education. They were pure clutterers, and they did not have any comorbid speech, language, cognitive, or psychiatric disorders. They did not have a history of stuttering in the past. All of them were aware of their speech problems and they considered themselves to be PWC. Based on the judgements of the two experts, subjects were classified as PWC if they had perceptually rapid and/or irregular speech rate and if their speech was characterized at least by one of the following (Bakker et al., 2011): (1) perceptually excessive disfluencies (the majority of them were non stuttering-like; the judgement was based on the subjective impression of the two experts), and/or (2) specific articulation characteristics which manifested in coarticulated speech or omissions of sounds and syllables, which excluded dyslalia or any other articulation disorder (Van Zaalen-op 't Hof et al., 2009a; Bakker et. al., 2011). This latter means that they produced some words like the following: *apveten* 'alapvetően, basically', *örkös* 'örökös, continual', *szretnék* 'szeretnék, I would like'. Not everyone's speech was characterized by both properties.

In the group of PWS, speakers were aged between 20 and 56 (six speakers were between 20 and 32, one speaker was 56-year-old). There were 5 males and 2 females. All of them were native Hungarian speakers with normal hearing, and they had at least 14 years of education. They had no hearing, neurological, mental, speech or language deficits. There were 4 PWS with severe stuttering, and 3 PWS with mild stuttering. The severity of stuttering was determined on the basis of a questionnaire for diagnosis (Feketéné Gacsó–Mácsainé 2007), and on subjective judgements on the frequency of disfluencies. All PWS participated in speech therapy.

In the control group, speakers were aged between 20 and 32. There were 6 males and 1 female. All of them were native Hungarian speakers with normal hearing, and they had at least 14 years of education.

Material

Spontaneous narratives were recorded from each speaker about the same topic: they were asked to speak about their own education, work, hobbies, and family. The interviewers let the participants talk freely, and they asked a question only when the speaker didn't know how to continue. The recordings were made digitally in a soundproof chamber. Analysis of 200 syllables of speech from each speaker was carried out according to the recommendation of the Systematic Disfluency Analysis (SDA) (Campbell–Hill 1994). In the

analysed Hungarian speech samples, 200 syllables were equal to 108-120 words.

Method

The occurrence of disfluencies were coded in the speech samples. The types of disfluencies were the following: interjections, whole-word repetitions, part-word repetitions, broken words, prolongations, revisions. Interjections were counted in total and in two types separately, too. (1) The first type contained fillers which were pauses filled with sounds (not words) (Fletcher 2010). In Hungarian, the most frequent filled pauses are *ö, m öm, öh* (Horváth 2010). (2) The second type contained filler words which meant the interjection of real words.

Disfluencies were considered singletons if there was only one disfluency in a word or between two fluent words. Disfluencies were considered disfluency clusters if more than one disfluencies occurred on the same word or adjacently. For example, disfluency clusters occurred in repetitions with a prolongation on one of the repeated elements, or with a filler between the elements. Prolongation on interjections (filled pauses) were not counted (as in Roberts et al. 2009). When there were two interjections between two fluent words (for example: *hát öö* 'well uhm') the case was considered as a cluster.

Calculating the frequency in clusters containing more than two elements (when comparing disfluencies as singletons to disfluencies in clusters), every occurrence was counted in the given type of disfluency cluster. After this comparison, the clusters which contained more than two disfluencies, i.e. complex disfluencies, were separately examined. Frequency values show how many disfluencies occurred in the analysed 200 syllables. All calculations and ratings were carried out twice by the author, two weeks apart. The results of the two analyses were similar in 100% of the cases.

Statistical analysis (Mann-Whitney test, Wilcoxon test, Pearson-correlation) was carried out by SPSS in a 95% confidence level.

Results

Table 2 shows the frequency of disfluencies by type and in total, and if they occurred as a singleton or in clusters in the speech of typical speakers, PWC and PWS. There was significant difference between typical speakers and PWS, and PWC and PWS in the frequency of all disfluencies (Table 3). PWS produced disfluencies more frequently than any of the other two groups. There was no significant difference between typical speakers and PWC in the frequency of all disfluencies.

There was no significant difference between the groups in the frequency of disfluency clusters despite the big differences in the means due to the large individual deviations in the background. For example, one speaker of the

PWS group produced only 6 disfluencies in clusters, while in the speech of another PWS with severe stuttering, 85 disfluencies in clusters occurred.

Table 2: Frequency of occurrence of disfluency types in 200 syllables (s = occurring as singletons, cl = occurring in clusters)

	Typical		**PWC**		**PWS**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Interjections						
s	6.14	2.41	3.29	2.06	4.57	2.94
cl	5.14	3.93	5.86	5.46	18.29	24.24
Total	11.28	5.53	9.15	6.69	22.86	24.87
Fillers						
s	5.71	2.29	1.86	1.86	4.57	2.94
cl	4.00	3.16	3.71	3.20	17.00	23.52
Total	9.71	4.92	5.57	4.04	21.57	24.16
Filler words						
s	0.43	0.79	1.43	1.27	0.00	0.00
cl	1.14	0.90	2.14	2.54	1.29	1.25
Total	1.57	1.13	3.57	3.55	1.29	1.25
Whole-word repetitions						
s	0.57	0.79	1.14	1.07	2.29	1.70
cl	0.86	1.57	2.71	1.98	3.43	3.10
Total	1.43	1.62	3.86	2.67	5.71	3.77
Part-word repetitions						
s	0.29	0.49	0.71	0.49	0.86	1.46
cl	0.14	0.38	1.00	1.53	2.14	1.57
Total	0.43	0.53	1.71	1.60	3.00	2.16
Prolongations						
s	1.14	1.07	0.14	0.38	6.86	9.06
cl	1.14	1.21	1.43	1.62	3.43	4.20
Total	2.28	2.06	1.57	1.72	10.29	13.16
Broken words						
s	0.14	0.38	0.00	0.00	0.00	0.00
cl	0.29	0.49	0.00	0.00	1.00	1.41

Total	0.43	0.79	0.00	0.00	1.00	1.41
Revisions						
s	0.57	0.53	1.14	0.90	0.14	0.38
cl	0.43	0.49	0.57	0.79	0.14	0.38
Total	1.00	1.15	1.71	1.25	0.28	0.49
All disfluency clusters	8.00	6.08	11.57	8.00	28.43	28.02
All singletons	8.86	3.53	6.43	2.51	14.71	9.23
All disfluencies	16.86	8.67	18.00	9.56	43.14	27.29

There was a significant difference between PWC and PWS in the frequency of singletons: PWS produced significantly more singleton disfluencies.

Table 3: Results of the statistical analysis (s = occurring as singletons, cl = occurring in clusters)

	Typical & PWC		**Typical & PWS**		**PWC & PWS**	
	Z	***p***	***Z***	***p***	***Z***	***p***
Fillers						
s	−2.578	0.010	-	-	-	-
Filler words						
s	-	-	-	-	−2.614	0.009
Whole-word repetitions						
cl	-	-	−2.746	0.006	-	-
Total	-	-	−2.323	0.020	-	-
Part-word repetitions						
Total	−2.047	0.041	−2.849	0.004	-	-
Prolongations						
s	−2.152	0.031	-	-	−2.267	0.023
All singletons	-	-	-	-	−2.380	0.017
All disfluencies	-	-	−1.983	0.047	−2.366	0.018

Typical speakers produced significantly more fillers and prolongations as singletons than PWC. However, the total of part-word repetitions was signifi-

cantly more frequent in PWC than in typical speakers. PWS produced significantly more whole-word repetitions (both in clusters and total) and total part-word repetitions than typical speakers. There was significant difference between PWC and PWS in the frequency of filler words as singletons and prolongations as singletons. The former one did not appear at all, the latter one was much more frequent in the speech of PWS.

The frequency of complex disfluencies were analysed, too (Table 4). Typical speakers produced only 4 of this type. This means that three typical speakers did not produce complex disfluencies at all, and four typical speakers produced only one of them. PWC produced altogether 10 complex disfluencies. In this group, there were also three speakers who did not produce this type of disfluency. However, there was another speaker who produced 4 complex disfluencies in the 200 syllables. PWS produced 28 complex disfluencies. In this group, there was only one speaker whose speech did not contain this phenomenon. PWS with the most severe stuttering produced 10 complex disfluencies in the 200 syllables.

Utterance (1) is an example for complex disfluency containing three elements: two fillers and one part-word repetition occur in this one. Utterance (2) is an example for complex disfluency containing many elements: eight fillers, two whole-word repetitions and one prolongation occur. (FIL = filler, SIL = silent pause)

(1) ***FIL*** *SIL* ***sz*** *SIL* ***FIL*** *szörnyű helytelen volt*
'it was FIL SIL a SIL FIL awfully incorrect'

(2) *eljutottam oda* ***hogy*** *SIL* ***hogy FIL*** *SIL* ***FIL*** *SIL* ***hogy hogy FIL*** *SIL egy* ***FIL*** *SIL bi****zz****onyos* ***FIL*** *SIL* ***FIL*** *SIL* ***FIL*** *SIL* ***FIL*** *társaságban*
'I got to a point that SIL that FIL SIL FIL SIL that that FIL SIL a FIL SIL cerrrtain FIL SIL FIL SIL DFIL SIL FIL in the company of…'

According to the Pearson-correlation, considering every speaker, there was strong significant positive correlation between the frequency of total disfluencies and the frequency of disfluency clusters ($r = 0.948$; $p < 0.001$), between the frequency of total disfluencies and the frequency of complex disfluencies ($r = 0.930$; $p < 0.001$), and between the frequency of disfluency clusters and the frequency of complex disfluencies ($r = 0.942$; $p < 0.001$).

Table 4: Frequency of complex disfluencies in typical, cluttered and stuttered speech in 200 syllables

	Mean	SD	Minimum	Maximum
Typical speakers	0.57	0.53	0	1
PWC	1.43	1.62	0	4
PWS	4.00	3.27	0	10

Discussion and conclusion

This paper analysed the frequency of disfluencies in the speech of PWC, PWS and typical speakers depending on whether they occurred as singletons or in clusters. Results confirmed the fact from previous studies, namely that there are not any differences between PWC and typical speakers in the frequency of the total of disfluencies, but there is significant difference between PWS and typical speakers. There had not been any data regarding the comparison between PWC and PWS. According to the results, there is significant difference between the two groups in the total of the disfluencies. Results – on the one hand – might contribute to the differential diagnosis of cluttering and stuttering, and might add to a more precise definition of cluttering, on the other hand.

Similarly to these results, Myers et al. (2012) did not find any differences between PWC and typical speakers in the frequency of the total disfluencies. They explain their results by the fact that cluttering is a multidimensional disorder and one factor (the frequency of disfluencies) is not enough for a proper diagnosis. In case of this study, the explanation is the same. However, stuttering might be well-distinguished from typical speech and cluttering, based on the frequency of disfluencies. This is the main symptom of stuttering, although there are large individual differences among PWS.

As regards to the types of disfluencies, this current paper presents different results than the previous studies did. Unlike the results of Myers et al. (2012), PWC and typical speakers of this study differed in the frequency of fillers as singletons, in the total of part-word repetitions and in prolongations as singletons. Between PWS and typical speakers, there were significant differences in the frequency of whole-word repetitions in clusters, in the total of whole-word repetitions, and in the total of part-word repetitions. Between PWC and PWS, there were significant differences in the frequency of the total of singletons, in filler words in singletons, and prolongations in singletons. The reason for these above mentioned differences from previous studies might be the small number of participants and the more dominant role of individual characteristic features.

The analysis had some limitations. One of them is the relative small number of participants. It is very difficult to find PWC with pure cluttering.

(There are other papers analysing speech of a few speakers, too; e.g. Bakker et al. 2011.) However, only 7 speakers per group are not enough for generalizing the results, because their data show individual characteristics. In addition, there were PWC and PWS with fluency disorders of different severity. For this reason, it might happen that mean values showed big differences between the groups, but according to the statistical analysis there were not any significant differences between them. There were speakers in both PWC and PWS groups who showed mild symptoms and others, who showed severe symptoms. This is why the results vary between 0 and very frequent, as regards to disfluency types.

Finally, we must not disregard the fact that recordings were made in one speech task as a structured interview. It is well known that PWC speak more fluently and show less symptoms in laboratory conditions. The stress of being recorded affects PWS exactly the opposite way as it does PWC. It is more difficult for PWS to speak. In their speech, there will be more frequent occurrences of the symptoms of stuttering.

Despite its limitations, this analysis might provide useful further information to the definition of cluttering, and to the differential diagnosis of cluttering and stuttering, and may also show a direction for future research.

References

Andrade, Claudia Regina Furquim de, Cervone, Luciana Maluf, & Sassi, Fernanda Chiarion 2003. Relationship between the stuttering severity index and speech rate. *Sao Paulo Medical Journal* 121/2. 81–84.

Bakker, Klaas – Myers, Florence L. – Raphael, Lawrence J. – St. Louis, Kenneth O. 2011. A preliminary comparison of speech rate, self-evaluation, and disfluency of people who speak exceptionally fast, clutter, or speak normally. In Ward, David – Scott, Kathleen Scaler (eds.): *Cluttering. A Handbook of Research, Intervention and Education*. Psychology Press, Hove and New York. 45–65.

Bóna, Judit 2008. A nyújtás sajátosságai a dadogó és az ép beszédben [Characteristics of prolongation in stuttered and typical speech]. *Beszédkutatás* 2015. 148–156.

Bóna, Judit 2012. Linguistic-phonetic characteristics of cluttering across different speaking styles: a pilot study from Hungarian. *Poznań Studies in Contemporary Linguistics* 48. 203–222.

Bóna, Judit 2016. Characteristics of pausing in normal, fast and cluttered speech. *Clinical Linguistics & Phonetics* 30/11. 888–898.

Campbell, June Haerle – Hill, Diane G. 1994. *Systematic disfluency analysis.* Northwestern University, Evanston, IL.

Feketéné Gacsó Mária – Mácsainé Hajós Katalin 2007. A dadogás és a hadarás vizsgálata. In Juhász Ágnes (ed.): *Logopédiai vizsgálatok kézikönyve*. [Handbook of Logopedic Examinations] Logopédiai Kiadó, Budapest. Annex 20.

Fletcher, Janet 2010. The prosody of speech: Timing and rhythm. In Hardcastle, William J. – Laver, John – Gibbon, Fiona E. (eds.): *The Handbook of Phonetic Sciences*. Blackwell Publishing Ltd., Oxford, UK. 521–602.

Gósy, Mária 2012a. Az artikuláció leállása a spontán beszédben. In Navracsics Judit – Szabó Dániel (szerk.): Mentális folyamatok a nyelvi feldolgozásban. Pszicholingvisztikai tanul- mányok III. Tinta Könyvkiadó, Budapest, 149–161.

Gósy, Mária 2012b. BEA – A multifunctional Hungarian spoken language database. *The Phonetician* 105-106. 50–61.

Gósy Mária 2012c. Sorozatmegakadások mintázata a spontán beszédben. [Series of disfluencies in spontaneous speech] *Beszédkutatás* 2012. 107–131.

Gósy, Mária – Bóna, Judit 2011. A case study on the effect of discourse type on fluency level in stuttering. *The Phonetician* 103-104/1-2. 57–76.

Heeman, Peter A. – McMillin, Andy – Yaruss, J. Scott 2006. An annotation scheme for complex disfluencies. In INTERSPEECH 2006. http://cslu.ohsu.edu/~heeman/papers/2006-icslp.pdf

Horváth, Viktória 2010. Filled pauses in Hungarian: Their phonetic form and function. Acta Linguistica Hungarica 57/2. 288–306.

Hubbard, Carol P. – Yairi, Ehud 1988. Clustering of disfluencies in the speech of stuttering and nonstuttering preschool children. *Journal of Speech and Hearing Research* 31/2. 228–233.

Kántor Gyöngyi 2015. Felnőtt dadogók beszédprodukcióinak műszeres elemzése és olvasásuk vizsgálata fMRI-vel. [Analysis of speech production of persons with stuttering (PWS) and reading of PWS with fMRI] Doktori értekezés. Pécsi Tudományegyetem.

LaSalle, Lisa R., – Conture, Edward G. 1995. Disfluency clusters of children who stutter: Relation of stutterings to self-repairs. *Journal of Speech, Language, and Hearing Research* 38/5. 965–977.

Levelt, Willem J. M. 1989. *Speaking: From intention to articulation.* The MIT Press, Cambridge (Massachusetts)–London (England).

Lickley, Robin J. 2015. Fluency and disfluency. In Redford, Melissa A. (ed.): *The handbook of speech production*. John Wiley & Sons, Inc, Hoboken, NJ. 445–474.

Myers, Florence L. – St. Louis, Kenneth O. 1996. Two youths who clutter, but is that the only similarity? *Journal of Fluency Disorders* 21/3-4. 297–304.

Myers, Florence L. – Bakker, Klaas – St. Louis, Kenneth O. – Raphael, Lawrence J. 2012. Disfluencies in cluttered speech. *Journal of Fluency Disorders* 37/1. 9–19.

Oliveira, Cristiane Moço Canhetti de – Broglio, Gabriela Aparecida Fabbri – Bernardes, Ana Paula Lazarin – Capellini, Simone Aparecida 2013. Relationship between speech rate and speech disruption in cluttering. *CoDAS* 25/1. 59–63.

Postma, Albert – Kolk, Herman 1993. The covert repair hypothesis: Prearticulatory repair processes in normal and stuttered disfluencies. *Journal of Speech, Language, and Hearing Research* 36/3. 472–487.

Robb, Michael P. – Sargent, Ainsley – O'Beirne, Greg A. 2009. Characteristics of disfluency clusters in adults who stutter. *Logopedics Phoniatrics Vocology* 34/1. 36–42.

Roberts, Patricia M. – Meltzer, Ann – Wilding, Joanne 2009. Disfluencies in non-stuttering adults across sample lengths and topics. *Journal of communication disorders* 42/6. 414–427.

Shriberg, Elizabeth Ellen 1994. *Preliminaries to a theory of speech disfluencies* (Doctoral dissertation, University of California, Berkeley).

St. Louis, Kenneth O. – Hinzman, Audrey R. – Hull, Forrest M. 1985. Studies of cluttering: Disfluency and language measures in young possible clutterers and stutterers. *Journal of Fluency Disorders* 10/3. 151–172.
St. Louis, Kenneth O. – Schulte, Katrin 2011. Defining cluttering: the lowest common denominator. In Ward, David – Scott, Kathleen Scaler (eds.): *Cluttering. A Handbook of Research, Intervention and Education*. Psychology Press, Hove and New York. 233–253.
Tetnowski, John A. – Scott, Kathleen Scaler 2010. Fluency and Fluency Disorders. In Damico, Jack S. – Müller, Nicole – Ball, Martin J. (eds.): *The Handbook of Language and Speech Disorders.* Wiley-Blackwell, Oxford, UK. 431–454.
van Zaalen-op't Hof, Yvonne – Wijnen, Frank – Dejonckere, Philippe H. 2009a. Differential diagnostic characteristics between cluttering and stuttering – Part one. *Journal of Fluency Disorders* 34/3. 137–154.
van Zaalen-op't Hof, Yvonne – Wijnen, Frank – Dejonckere, Philippe H. 2009b. Language planning disturbances in children who clutter or have learning disabilities. *International Journal of Speech-language Pathology* 11/6. 496–508.
Ward, David 2006. *Stuttering and cluttering: frameworks for understanding and treatment.* Psychology Press, West Sussex, UK.
Vasiç, Nada – Wijnen, Frank 2001. Stuttering and speech monitoring. In *ISCA Tutorial and Research Workshop (ITRW) on Disfluency in Spontaneous Speech*. 13–16.
Wingate, Marcel E. 1964. A standard definition of stuttering. *Journal of Speech and Hearing Disorders* 29/4. 484–489.

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Megakadások és megakadásklaszterek hadaró, dadogó és tipikus beszélők beszédében

A spontán beszédben megjelenő megakadások állhatnak önmagukban vagy klasztert alkothatnak más megakadásokkal. Megakadásklaszternek nevezzük azokat az eseteket, amikor ugyanazon szón vagy két egymást követő szón több megakadás fordul elő. A jelen tanulmányban azt vizsgálom, hogy milyen különbségek vannak a magukban megjelenő és a klaszterben megjelenő megakadások gyakoriságában és típusaiban a hadaró, a dadogó és a tipikus beszélők között. Elemeztem azt is, hogy milyen gyakorisággal jelennek meg

a komplex megakadásklaszterek, amelyek több mint 2 megakadás együttes megjelenéséből állnak.

Az eredmények azt mutatják, hogy a legnagyobb különbséget a megakadások típus szerinti gyakoriságában a tipikus beszélők és a dadogók között találjuk. A tipikus beszélők és a hadarók között nem volt különbség a megakadások gyakoriságában, csak egyes típusaiban. A dadogók és a hadarók szignifikánsan több komplex megakadást produkáltak, mint a tipikus beszélők.