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Comprehensive Study of Speech and Personal Changes in the Process of Logopsychotherapy

Natalia L. Karpova
Psychological institute of Russian Academy of Education,
Moscow, Russia
Janna M. Glozman
Lomonosov Moscow State University, Department of Psychology,
Moscow, Russia
Maria M. Danina
Elizaveta I. Elistratova
Psychological institute of Russian Academy of Education,
Moscow, Russia
Dmitry N. Cheburashkin-Antipov
Lomonosov Moscow State University, Department of Economics,
Moscow, Russia

Комплексное исследование речевых и личностных изменений в процессе логопсихотерапии

Наталия Л. Карпова
Психологический институт Российской академии образования,
Москва, Россия
Жанна М. Глозман
Московский государственный университет имени М. В. Ломоносова, факультет психологии,
Москва, Россия
Мария М. Данина
Елизавета И. Елистратова
Психологический институт Российской академии образования,
Москва, Россия
Дмитрий Н. Чебурашкин-Антипов
Московский государственный университет имени М. В. Ломоносова, факультет экономики,
Москва, Россия

Corresponding author. E-mail: nlkarpova@mail.ru

Abstract. The article presents the results of a comprehensive psychological and neuropsychological study of speech and personality changes in the process of socio-rehabilitation

of different age groups of family logopsychotherapy. 29 subjects, aged 8–32 years, took part in the study. 18 of them were males and 11 were females. After the end of family logopsychotherapy, significant differences were revealed in their praxis, memory, and verbal functions. Significant differences were also found in the rigidity of the emotional state and self-esteem. Some differences between different groups of participants are explained by composition and format of work in different years.

Keywords: *stuttering; speech; personality; assessment; family group speech therapy*

Аннотация. В статье представлены результаты комплексного психологического и нейропсихологического исследования речевых и личностных изменений в процессе социореабилитации у участников разновозрастных групп семейной логопсихотерапии. Всего в исследовании приняло участие 29 человек в возрасте 9–32 лет, из них 18 мужского пола и 11 женского. Были выявлены значимые отличия в показателях функций праксиса, памяти и речи после прохождения участниками группы семейной логопсихотерапии. Значимые различия были обнаружены также по параметрам ригидности и самооценки эмоционального состояния. Были выявлены некоторые отличия между участниками разных групп, что связано со спецификой состава и формата работы в разные годы.

Ключевые слова*: заикание; речь; личность; диагностика; семейная групповая логопсихотерапия*

Introduction

As L. S. Vygotsky noted, "…any defect is not limited to an isolated loss of function, but entails a radical restructuring of the entire personality" (Vygotsky, 1983, p. 43). It is especially true for communication defects, as well of organic (aphasia) or functional (logoneurosis) or social (lack of development of communication skills) nature (Glozman, 2004).

The stuttering (logoneurosis) has a complex psychological structure (combination of speech fluency disturbances and of the patient's personality disorders) and can serve as a means for analyzing a whole range of speech practices (Karpova & Glozman, 2019). Modern ideas also emphasize the complex and systemic nature of this disorder, which includes biological, psychological and social factors. Respectively, the assessment should include an assessment of all these factors.

The specific feature of speech pathology in the form of stuttering is that in many subjects speech disturbance is not the major problem. Instead of this, its neurotic component leads to a complex "set" of communication problems (fear of speaking in public, shyness, increased anxiety about the attitude of others, suspiciousness). The mediating role of parents in the formation of the self-esteem of a child with stuttering also affects the restoration of impaired verbal communication (Karpova & Nikolaeva, 2020).

Therefore, remedial work with stuttering should be comprehensive and combine speech therapy, psychological and psychotherapeutic approaches. One of the scien-

tifically grounded systems in this area is group logopsychotherapy (Nekrasova, 1968, 1992, 2006) and the system of family group logopsychotherapy developed on its basis by Yu. B. Nekrasova and N. L. Karpova (Karpova, 1997/2003, 2011; Karpova, Volkova, Kruglikova, & Yanchenko, 2007), where parents and relatives are included in the rehabilitation work with stutterers at all stages.

We present the methodological aspects of assessing the effectiveness of restoring impaired verbal communication in people who stutter through evaluation participants of different age groups of family logopsychotherapy. Assessment took place before and after the course of social rehabilitation (Karpova & Danina, 2018; Karpova, Danina, & Elistratova, 2018). Results of many years of work with people who stutter are summarized in the collective monograph *Family group logopsychotherapy: A study of stuttering* (Karpova, 2011). Various psychological and pedagogical aspects of the problem of stuttering and its correction were discussed in it. In recent years, our approach to the sociorehabilitation of people of different ages who stutter is focused on the neuropsychological and psychophysiological research at all stages of logopsychotherapy.

The purpose of this article is to present the results of the study of speech and personal changes in the participants of family group logopsychotherapy in recent years.

Subjects

The subjects were the participants in family group logopsychotherapy of 2018–2020 with a total number of 29 people aged 8–32, of which 18 were males and 11 were females. Experts assessed the severity of speech and personality disorder on a 3-point scale, where 3 is the *maximum* severity of speech and/or personality disorder, 2 is *moderate* degree of disorder, 1 is a *mild* degree of disorder. At the time of the initial examination, before treatment started, 16 subjects (55.2 %) had severe speech disorder (score 2.5–3), 4 people (13.8 %) mild degree of speech disorder (score 1) were identified, the remaining 9 people had a moderate degree of speech disorder (score 1.5–2). According to the degree of personal problems associated with speech communication, 19 out of 29 people (65.5 %) had severe personality disorder (score 3), 10 had a moderate degree of personality disorder (score 1.5–2) and none had mild disorder (score 1).

Also, each group differed in its composition and characteristics.

Group 1 (2018): eleven 12–32 years old subjects, of which 8 were males and 3 were females (the average age of 21.1 years); with the traditional distribution of male and female participants (3 : 1). For the first time in our experience, 9 out of 11 people had a severe degree of speech and personality disorders (as mentioned above, it was assessed by experts).

Group 2 (2019): nine 13–27 years old subjects (4 males and 5 females, average age — 19.2 years); the peculiarity of the group is that for the first time in our practice there were 5 girls out of 9 subjects.

Group 3 (2020): nine 8–17 years old subjects (6 males and 3 females, average age — 13.9 years). This group consisted entirely of schoolchildren 9–16 years old. Because

of pandemic for the first time the treatment course at the active stage of family group logopsychotherapy was carried out in online format using Zoom platform.

Research Design

To conduct a comprehensive psychological and neuropsychological study, we did three assessments: before and after the main course of active family group logopsychotherapy and at the end of the control-supporting stage. The course program was adapted for this complex study. 26 of 29 participants completed the full course of social rehabilitation and all assessments.

The system of *family group logopsychotherapy* consists of 4 main stages:

Stage I — propaedeutic diagnostic stage lasts for 3–6 months and is based on dynamic psychotherapeutic assessment developed by Yu. B. Nekrasova for stutterers. It was extended and supplemented by N. L. Karpova for their family members.

Stage II is a session of emotional stress psychotherapy by K. M. Dubrovsky, modified by Yu. B. Nekrasova. In 1 to 1.5 hours, it removes the symptoms complex of stuttering through "personality reconstruction" in a frustrating situation.

Stage III — active family group logopsychotherapy — follows the Stage II and lasts for 3–4 weeks. The main goal of daily 8–9-hour classes is the formation of sanogenic (health-improving) mental states through their consistent evocation, prolongation and consolidation as persistent personality changes. The creative methods of bibliotherapy, symbol therapy, kinesiotherapy meet this purpose.

Stage IV — control-supporting stage — takes place in six months, lasts for 2 weeks and repeats the main elements of the previous stage at a higher level of complexity. It uses also new elements and methods (film and video therapy, etc.) (Karpova, 2011).

All subjects underwent *neuropsychological assessment* of cognitive (speech, memory, perception, reasoning), motor and neurodynamic functions before the start of active group work. We used the methods developed by A. R. Luria, with a quantitative (scoring) evaluation of the severity of defects (Glozman, 2012).

Psychological assessment — a study of the severity of speech and personal problems associated with speech communication. We evaluated the State and personal anxiety, rigidity and self-assessment of emotional states as well as the self-perception of communicative situations by participants before and after a course of family group logopsychotherapy. The following methods were used: State-Trait Anxiety Inventory (Spielberger, 1989), Rigidity Test (Levitov, 1977), Ricks-Wessman Test (Wessman & Ricks, 2004), Self-Characteristics Questionnaire by Yu. B. Nekrasova (1980), as well as the analysis of medical documents and independent experts method.

Comprehensive Study Results

Neuropsychological Assessment

The results of neuropsychological assessment are presented on an extended sample of 34 subjects: the data of 29 main participants are supplemented by data from 5 graduates of the groups of previous years who actively participated in the work helping newcomers. All subjects were divided by age into 2 subgroups: 8–19 years old (19 people) and 21–32 years old (15 people). The *Tables 1–3* present the results of the examination before and after the full course of speech therapy.

Table 1

Results of neuropsychological assessment. Average penalty scores for different mental functions

Age	Neuro-dynamics		Praxis		Speech		Gnosis		Memory		Reasoning		Total score	
	before	after	before	after	before	after	before	after	before	after	before	after	before	after
9–19	**.55**	**.45**	**.48**	**.21**	**.37**	**.15**	**.79**	**.34**	**.39**	**.09**	**.34**	**.20**	**2.92**	**1.44**
Dynamics in the subgroup	.11 (1.24)		.27 (2.30)		0.22 (2.43)		.45 (2.31)		.30 (4.30)		0,14 (1.68)		1.48 (2.02)	
21–32	**.30**	**.13**	**.19**	**.06**	**.38**	**.15**	**.13**	**.00**	**.37**	**.09**	**.13**	**.03**	**1.50**	**.47**
Dynamics in the subgroup	.17 (2.25)		.13 (3.30)		.22 (2.43)		0.13 (–)		.28 (4.10)		.10 (3.99)		1.03 (3.20)	

Table 2

Assessment of the significance in the dynamics of neuropsychological indicators according to the Wilcoxon sign rank test (subgroup 9–19 years old)

Statistical criteria	Summary of Wilcoxon signed rank test for related samples						
	neuro-dynamics	praxis	speech	gnosis	memory	reasoning	total score
Negative discrepancies	7	19	17	8	17	13	19
Positive discrepancies	4	0	0	0	0	1	0
Matching observations	8	0	2	11	2	5	0
Total score	19	19	19	19	19	19	19
W	27	0	0	0	0	3,5	0
Z	–.544	–3.839	–3.624	–2.555	–3.629	–3.119	–3.823
p	.586	.000**	.000**	.011*	.000**	.002**	.000**

Note. * $p < .05$; ** $p < .01$.

Table 3

Assessment of the significance of the dynamics of neuropsychological indicators according to the Wilcoxon sign rank test (subgroup 21–32 years)

Statistical criteria	Summary of Wilcoxon signed rank test for related samples						
	neuro-dynamics	praxis	speech	gnosis	memory	reasoning	total score
Negative discrepancies	4	13	12	2	14	8	15
Positive discrepancies	0	0	0	0	0	0	0
Matching observations	11	2	3	13	1	7	0
Total score	15	15	15	15	15	15	15
W	39	0	0	0	0	6	0
Z	–1.890	–3.194	–3.062	–1.342	–3.326	–2.565	–3.408
p	.059	.001**	.002**	.180	.001**	.010*	.001**

Note. * $p < .05$; ** $p < .01$.

Let's take a closer look at each of the indicators.

Neurodynamics. Neurodynamics variability depends on the age of the participants and negative trends are presented in the younger subgroup (up to 21 years old). In 56 % of the group participants, the neurodynamic indices did not change; in 32 %, it was positive, in 12 % — negative. However, when dividing into age subgroups, it was found that negative dynamics was observed only in the younger age subgroup (under 21 years old): 7 out of 19 had positive dynamics (37 %), 4 had negative (21 %), 8 had no changes (42 %). For comparison: in the older age subgroup (from 21 years old), there was positive dynamics in 4 participants (27 %), in 11 out of 15 (73 %) changes in neurodynamics were not found, neither were negative changes. In general, for both subgroups, the dynamics are positive. The penalty scores in the subgroup under 21: before therapy 0.55, after — 0.45; in the subgroup over 21 years old: before therapy 0.30, after — 0.13.

Thus, it can be concluded that fluctuations in neurodynamic status are mainly observed at the age of up to 21 years, and negative dynamics are observed exclusively in this younger subgroup. In subjects over 21 years of age, this function is stable and can be considered as an indicator of its maturity. There were no statistically significant differences in neurodynamic status before and after therapy.

Praxis. In 32 out of 34 subjects, noticeable positive changes in praxis were revealed, i. e. this function showed a significant ($p < .01$) positive dynamics after therapy. At the same time, there are significant differences in the subgroups in terms of the average penalty scores: the younger subgroup is characterized by significantly more pronounced disturbances in the sphere of praxis (in the subgroup under 21 years old: before therapy, 0.48, after — 0.21; in the subgroup older than 21 years before therapy, 0.19, and after — 0.06).

Speech. In 29 out of 34 subjects, we revealed positive changes in speech: improvement of prosodic, grammatical correctness and development of expressive speech, increased vocabulary, improvement of writing, i. e. this function showed a pronounced positive trend in the course of therapy. There are no age differences.

Gnosis. The picture is similar to that observed in neurodynamics. A pronounced predominance of disturbances of acoustic gnosis in the subgroup of subjects under 21 years was revealed. In 3 subjects with severe disturbances of acoustic gnosis, no positive dynamics is observed (average scores in the subgroup under 21: before therapy 0.79, after — 0.34; in the subgroup older than 21 years: before therapy 0.13, after — 0.00, i. e. complete normalization of the function).

Memory. Memory function during therapy showed high plasticity: in 31 out of 34 subjects positive dynamics (91 %) was revealed. No changes were found in the remaining 3. There were no age-related differences, and positive dynamics was strongly expressed in both subgroups ($p < .01$).

Reasoning. The predominance of disturbances of the intellectual sphere in the younger subgroup is noticeable. The dynamics in both subgroups is positive, but in the younger subgroup it is more pronounced (in the subgroup under 21 years old: before therapy 0.34, after — 0.20, $p < .01$; in the subgroup over 21 years old: before therapy 0.13, after — 0.03, $p < .05$).

Thus, we revealed the differences between the younger and older subgroups. The younger group consists in a greater number and greater severity of disorders in different mental functions. The largest number of disturbances are in the functions of praxis, memory and speech. Memory and speech disorders do not depend on age, and praxis disorders are noticeably more pronounced in the younger subgroup. At the same time, the therapy had the greatest effect on these three functions ($p < .01$): praxis, memory and speech — positive dynamics is observed in all subjects with impaired functions.

To a lesser extent, the subjects have intellectual defects, and although positive dynamics is clearly traced in both subgroups, it is more pronounced in the younger subgroup ($p < .01$) than in the older subgroup ($p < .05$). At the same time, disturbances of the reasoning are more pronounced in the younger subgroup, while in the older subgroup they are less common, less pronounced and respond well to the therapy.

Age-related differences can be seen in different mental functions with general positive dynamics after logopsychotherapy. The greatest dependence on age was shown by the functions of acoustic gnosis and neurodynamics. In the older group, these disturbances are rare, isolated and less pronounced. In the younger group, these disturbances are revealed in more than half of the cases. Acoustic gnosis in general shows positive dynamics in the course of therapy, although not very pronounced: for the younger subgroup, $p < .05$, and for the older subgroup, the differences before and after therapy are statistically insignificant. Neurodynamics is highly variable in the younger group, showing different directions: negative dynamics in 4 subjects, positive — in 7 subjects of the younger group. In the older group, this function is more stable. This explains the absence of statistically significant differences in neurodynamic scores in both subgroups before and after therapy.

Psychological Assessment

The positive results, revealed by the participants' neuroassessment were confirmed by the psychological assessment. We tested the differences in psychological values before and after the course of family group logopsychotherapy for participants in Moscow — 2018, 2019, and 2020 groups. The groups were compared using the Wilcoxon test, the data are presented in the *Table 4*.

Significant differences were shown between the values before and after treatment in the Rigidity Test in participants of all three groups ($p < .001$), as well as in the Ricks-Wessman Test ($p < .0004$). With regard to Spielberger Test, a significant difference was found only in trait anxiety in one of three groups, however, based on the analysis of more detailed data for each group, it can be concluded that there are corresponding tendencies for significance.

Table 4

Comparison of values in psychological questionnaires in the 2018, 2019, and 2020 groups

Questionnaire/scale	Average Values Group 2018	Average Values Group 2019	Average Values Group 2020
Rigidity *before* the course	.54	.58	.54
Rigidity *after* the course	.44*	.41*	.43*
Emotional state (Ricks-Wessman Test) *before* the course	24	23.89	24.18
Emotional state (Ricks-Wessman Test) *after* the course	27.67*	32.28*	28.09*
State anxiety (Spielberger Test) *before* the course	38.78	40.14	48.8
State anxiety (Spielberger Test) *after* the course	35.37	35.14	45.7
Trait anxiety (Spielberger Test) *before* the course	49.44	49.57	51
Trait anxiety (Spielberger Test) *after* the course	38.87*	42.71	46.67

Note. * $p < .05$.

The comparison of the mean values for the tests in three groups suggests that there are no significant differences between groups, that is the sample is homogeneous. Thus, despite the differences in ages and gender proportions, the different format (on or off line) of the treatment course during family group logopsychotherapy, in general, the studied characteristics of the subjects coincide.

According to the results of participants examination at the end of the active course of family group logopsychotherapy, 2 out of 16 (7 %) remained with a high degree of speech disorders (score 2.5–3). The moderate degree of speech defects (score 1.5–2) was noted in 10 participants (34.5 %); 9 subjects (31 %) had mild speech disorders (score 0.5–1),

8 people (27.5 %) achieved a fluent speech. According to the degree of personal disorders associated with verbal communication, with some improvement, 3 out of 19 people (10.3 %) had a high degree of personality disorders (2.5 points), 12 had a moderate degree (points 1.5–2), 14 people had mild degree (score 0.5–1). It should be underlined, that before the start of the course, all participants had severe or moderate personality problems. Thus, improvements in all indicators, both in speech and in personal disorders, occurred in all group members, and 27.5 % of the participants achieved fluency in speech as a result. This corresponds to the results of logopsychotherapy done by Yu. B. Nekrasova (1968).

Comparison of the dynamics of values by tests in all three groups deserves special attention (*Table 5*).

Table 5

Comparison of the dynamics of values of psychological questionnaires in the 2018, 2019, and 2020 groups

Questionnaire/scale	Average values Group 2018	Average values Group 2019	Average values Group 2020
Rigidity	–.1	–.17	–.11
Emotional state (Ricks-Wessman Test)	3.67	8.39	3.91
State anxiety (Spielberger Test)	–3.41	–5	–3.1
Trait anxiety (Spielberger Test)	–10.57	–6.86	–4.33

The comparison of the dynamics of values of questionnaires allows us to state some differences. For example, the 2018 group showed the strongest dynamics in personal anxiety by the end of the course compared to the 2019 and 2020 groups. Other most noticeable differences can be observed in the dynamics of values in the Ricks-Wessman Test (self-assessment of emotional states) in 2019 compared to other years. Rigidity indicators have similar dynamics in all three groups. Despite the fact that on the basis of such a comparison it is impossible to draw a conclusion about the reasons for these particular data, we can assume that the severity of speech and personality disorders, as well as the format of the group's work, are of great importance.

In addition to the quantitative study of the dynamics of scores in the group's members, qualitative methods were used — the Self-Characteristics Questionnaire. They allow one to see meaningful changes in the own representation of the speech problem. We have developed a categorical grid for content analysis of subjects' self-characteristics (*Table 6*). This categorical grid reflects both the content aspects of the texts (used words that are close in meaning) and the formal ones — the total number of categories, positively and negatively colored categories, categories denoting attitudes towards oneself and categories denoting attitudes towards speech.

Table 6

Analysis of self-characteristics of group members of 2018, 2019, 2020 years

	Most frequently used categories	Positive categories about oneself	Positive categories about speech	Negative categories about oneself	Negative categories about speech	Total
			2018			
Before the course	"Sincere," "good at home"	114	75	39	16	250 words / 119 categories (0.79)
After the course	"Calm," "treatment helped"	27	27	0	11	68 words / 45 categories (0.66)
			2019			
Before the course	"Kind," "insecure"	25	11	38	6	341 words /126 categories (0.31)
After the course	"Confident," "easier to speak"	10	7	0	0	112 words /39 categories (0.34)
			2020			
Before the course	"Kindness," "laziness"	32	15	9	3	225 words /123 categories (0.54)
After the course	"Confidence," "there is an effect"	13	18	3	0	85 words /38 categories (0.44)

It can be seen that the indicators in the three groups differ, maintaining the general trend towards a decrease in the number of words and categories *after* rehabilitation, especially negative ones. In the 2018 group, negative categories about speech remain after working in the group. In 2020, negative categories about oneself remain. This result can be associated with significantly more severe speech disorders in 2018-year participants and the online work of the group's in 2020. The overall results for all three groups are presented in *Table 7*.

A general decrease in both positive and negative categories in relation to the person himself and his speech after completing the course is evident. It can be assumed that the adequacy of self-perception of participants will increase by the end of work in the system of family group logopsychotherapy.

Table 7
Overall results of self-assessment in categories by groups 2018, 2019, 2020

	Positive categories about myself	Positive categories about speech	Negative categories about myself	Negative categories about speech
Before the course	171	101	86	25
After the course	50	52	3	11

Discussion

Numerous studies of stuttering suggest the neuropsychological basis of speech impairment. So, within the functional system of speech, the violation of the mechanism of readiness for speech contributes to the formation of stuttering (Glozman, 2004). Adult stutterers show increased activity in parts of the right hemisphere and abnormal coordination between areas of the brain that plan and execute speech function (Glozman, 2019).

This is consistent with the results of the presented study. We have shown that the subjects of the younger subgroup under 21 years of age differ initially having more pronounced defects (the total score is three times higher than that of the older subgroup) in praxis, gnosis, reasoning, neurodynamics (including large fluctuations in neurodynamic state), and show less pronounced positive dynamics during therapy for all functions. Subjects over 21 years of age have initially a less pronounced defect, more stable functions (when compared before and after therapy), lack of negative dynamics and have a significantly more pronounced positive dynamics in all functions during therapy, except for speech and memory, where the dynamics is equally high in both subgroups. This picture can be explained by the maturity of the central nervous system and of coordination between brain regions in subjects over 21 years old, and the higher positive dynamics of the older group is a consequence of the developed HMF (Higher Mental Functions), which makes it possible to implement compensatory mechanisms and of a greater social experience in surmounting problems.

We reviled a significant correlation between the degree of stuttering/personality problems with the total score of neuropsychological examination and with the score for speech defects (Glozman, Karpova, & Cheburashkin-Antipov, 2018a). The degree of personality problems (according to expert assessment) significantly correlates with the score for praxis, memory, gnosis, and reasoning in neuropsychological examination. This connection is reasonable and confirmed by practical experience of working with severe cases of stuttering, but the nature of this connection has not yet been established. We assume that personality and speech disorders have common factors and reinforce each other in ontogenesis (Glozman, Karpova, & Cheburashkin-Antipov, 2018b).

The relationship between the severity of communication defects and the quality of life and indicators of mental health in various age and nosological groups has been experimentally proved. The mobilization of personal resources in the groups of family speech psychotherapy contributes to the overall positive dynamics of mental health indicators. This is achieved through a system of creative functional learning in various situations of verbal communication, where new methods of self-regulation and effective communication are purposefully developed, formed and automated (Karpova & Danina, 2019). Our research also confirms the efficiency of the integrated approach to restore the impaired verbal communication in the family group logopsychotherapy (Karpova, 2011; etc.).

Conclusion

A comprehensive study of speech and personality changes in the process of speech psychotherapy shows evident positive dynamics of indicators reflecting neuropsychological, verbal and personal changes in group members. In general, we can state the homogeneity of the psychodiagnostic data before the start of treatment, regardless of the sex and age differences of the participants. At the same time, neuropsychological indicators differ in the groups of younger (under 21 years old) and older participants, which is a natural consequence, given the heterochrony of maturation of the studied functions in the process of ontogenesis.

Neuropsychological assessment showed that functions such as praxis, memory and speech are the most impaired in stuttering, and they show the most pronounced dynamics after undergoing a course of family group logopsychotherapy.

Personality assessment showed significant differences between the participants values before and after treatment in the Rigidity Test in all three groups ($p < .001$), as well as in the Ricks-Wessman Test ($p < .0004$), but not according to the Spielberger Test (with the exception of the 2018 group, which had the most severe personality disorders at the time of treatment).

Thus, in the course of a complex, multifaceted, but at the same time methodologically structured work, not only speech amelioration is achieved (a decrease in the intensity and frequency of stuttering), but also significant personality changes are observed (attitude to speech communication, the level of logo phobia, adequate awareness of speech defect, perception and behavior in critical situations, the level of egocentrism, using coping strategies, communication skills and other parameters of speech communication that are significant for stutterers).

It can be argued that the system of creative functional training in various social conditions of communication with the active participation of parents and relatives of stutterers has a beneficial effect on the possibilities of verbal communication in subjects.

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Limitations

The limitations of the study are related to the small sample size and the inability to control the gender-age influences. Besides, a significant limitation is the lack of a control sample for a full controlled randomized study of the effectiveness of family group logopsychotherapy.

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