# Mental Health of Preschool and Primary School Children: Dynamics and Improvement

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**Research**

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# Abstract

**Background:** Improving the mental health of children is one of the main tasks for modern society. The aim of the work is to study the dynamics of mental health in preschool and primary school children under a psychological and pedagogical experiment.

**Methods:** The study was conducted at 12 kindergartens (250 children) and 3 primary schools (200 children) in 2018 – 2019, in Moscow (Russian Federation). Children of each age group were divided into 2 groups according to the time spent on the Internet. The control group spent up to 15 minutes a day. The experimental group had an uncontrolled pastime. In total, there were 4 groups. The performance indicators (average score) and the dynamics of aggression were studied. The parents were provided with a survey. Children and parents had lectures with psychologists and teachers during the second academic year. The child aggression can be associated with an extra time spent on the Internet and the conniving attitude of parents.

**Results:** The conducted research confirmed the importance of complex actions in reducing the aggressiveness and improving the mental health of children. The joint work of psychologists, parents and children themselves gave positive results. The control groups children significantly faster reduced aggressiveness by 1.4 - 1.6 times, on average, comparing to the experimental groups (1.2 times, $p \leq 0.05$). The aggressiveness of children is associated with a lack of parents' attention, that leads to uncontrolled surfing on the Internet and playing video games. Children from the experimental group demonstrated aggressive behavior 1.5 - 1.7 times more often than children from the control group ($p \leq 0.01$). The survey of parents showed the same pattern. Thus, connivance of aggression and an aggressive reaction to communication with teachers were more significant (0.5 - 0.7 times, $p \leq 0.05$) in the experimental group compared with the control.

**Conclusions:** The improvement of the behavior of children was successful already after a 1 year of the experiment. The academic performance improved, while aggressiveness decreased in all groups.


# Background

In modern society, along with an increase in socialization, the number of people with distinctive features in behavior is also increasing. Children of both primary school and preschool age are of no exception [1]. The emotional characteristics, associated with children of this age, include insecurity, growing anxiety, and emotional instability [2]. Thus, the mental, physical and emotional health of preschool and primary school children should be monitored and subsequently improved. In any school or kindergarten, there is a set of rules that must be followed by children. Children with emotional or mental disorders have difficulties to comply with those rules [3]. The development of correct behavior is important for children growing in accordance with the concepts of a healthy psyche and emotional development. Moreover, it contributes to the development of a full-fledged personality without deviant behavior [4]. Socially, emotionally, psychologically prepared children are the key to a healthy society.

The psychological inadaptation influences the inner world of a preschool and primary school child [5]. Inadaptation is characterized by a mismatch between the psychological and emotional state of a child and the requirements of a new social environment [6]. The cause for inadaptation may be a transfer between kindergartens, or kindergarten to school [7]. Inadaptation is balancing between the normal and pathological mental state of the child. The mental and social inadaptations are distinguished [8]. Most works on mental health improvement consider inadaptations in school and preschool children separately [9–11]. A separate area studies child at risk of social inadaptations [12, 13]. Lack of motivation to study and lack of interest in the process of learning are considered as consequences or manifestations of inadaptations [14]. The social inadaptation is characterized by the progressive failure of the student's performance.

Meanwhile, the mental inadaptation is associated with deviant behavior [15]. Social networks and computer games are the cause of the loss of interest in learning among school children. According to some studies, this is a result of insufficient attention to the child on the part of the parents [16]. Inadaptation is usually associated with the so-called "age crisis of seven years" [17, 18]. A 7-year-old child develops own internal position (attitude) towards society and the system of rules. At primary school age, a bunch of internal attitudes and motivation for participation in the educational process is formed. Generally, in the process of studying, the educational and cognitive activity should dominate over playing. The academic success is greatly influenced by parents. Education is also important for the development of emotional and psychological spheres of preschool and primary school children [19].

Another important aspect of primary school age is the increased aggression. The aggressiveness of children is caused by the transition of children from one educational environment (kindergarten) to another (school), since it is necessary to adapt to completely new conditions. In case of untimely attention to this problem, a person is formed with a deviant and asocial type of behaviour, incapable of analyzing facts and a holistic perception of the surrounding reality. According to some reports, the aggressiveness of primary school children is a serious problem in modern schools [20, 21]. The mental health of primary school and preschool children is a complex concept. This includes the following components [22]:

1. simultaneous development of the child's inner world and the mechanisms of the psyche that determine his interaction with the outside world;
2. harmony with the external world and the inner self; coordination of actions in response to stimuli from the external world;
3. perception of peers from the social circle in an open, disinterested form; a dynamic contact of emotional origin;
4. mental health of the child is not constant, since the personality is a dynamic system that has its own mechanisms of development and self-organization;
5. impossibility of applying any single criterion to all individuals, since each person is one of a kind and unique;

6. adequacy of the emotions expressed by the child depends on his emotional background and experiences;
7. a child, interacting with a loved one, develops a subjective position that determines his activity and mental health;

Thus, parents also have a significant impact on the mental health of preschool and primary school children.

There are few works using an integrated approach to the study of the mental health of primary and preschool children. Basically, researches consider these two age groups separately [23, 24]. For a full understanding of what processes occur during the transition from one age group to another, as well as from one environment (kindergarten) to another (school), it is necessary to comprehensively study the educational and cognitive activity (academic performance), aggressive behaviour and the attitude of parents to success or the failure of a child. This article attempts to do this. The academic performance and aggressiveness influence the mental health of a child. The academic performance can be associated with generally accepted norms of behaviour. The aggressiveness determines the deviant development of the personality in the future. The aim of the work is to carry out a comparative analysis of changes in mental health among preschool and primary school children under a psychological and pedagogical experiment. The objectives of the study included: a) to study the dynamics of changes in mental health among children attending kindergartens; b) to conduct a similar analysis among primary school children; c) to assess prevailing factors in each of the age groups; d) to assess these factors in groups of children who spent their leisure time playing computer games or on the Internet (watching videos, cartoons, etc.).

## Materials And Methods

# Materials

The study was conducted in 2018–2019, during the academic year (from January to June and from September to December). The study involved 250 preschool children, 125 boys and girls each (average age of boys 5.1 ± 0.5 years, girls – 5.0 ± 0.3 years). The study was conducted at 12 state kindergartens in Moscow (Russian Federation). All children were in the same conditions guaranteed by the instructions of the RF Ministry of Education. Similarly, the study involved 200 primary school children of the first grade (100 girls and 100 boys, average age 7.1 ± 0.6 for boys and 7.3 ± 0.4 for girls). The study was simultaneously conducted at three schools in Moscow. The students were also in identical conditions. The study involved parents of preschool children (253 people in total) and primary school children (208 people). After a survey of parents, children were divided into groups, according to the time spent on the Internet, watching videos and playing video games.

The first group included children from kindergarten who spent almost all their leisure time on the Internet or playing video games (101 people, 56 boys and 45 girls). The second experimental group include children, whose leisure time on the Internet took no more than 15 minutes a day on weekdays and up to

30 minutes on weekends. The second group included 149 children, 69 boys and 80 girls. The third group include primary school children who spent almost all their leisure on the Internet – (89 people, 53 boys and 36 girls). The fourth group include 111 children (64 girls and 47 boys) whose leisure time on the Internet took no more than 15 minutes a day. Thus, the control groups were the second and the fourth, the experimental - the first and the third among preschool and primary school children.

# Study design

The inclusion criteria are: a) the identity of the educational conditions of children; b) compliance with the age criterion; c) the absence of mental or physical abnormalities. Therefore, the study did not include kindergartens specializing in the development of children with hearing, speech, vision, or physical and mental disorders.

Informed consent was signed by parents of the children. Thus, parents gave their consent to the processing of information, subject to the anonymity of the participants. This study was conducted in accordance with international practice of ethical and moral standards.

# Research methods

The study used data on children, obtained from kindergarten and primary school teachers, as well as psychologists in kindergartens and general education schools. The observation method was used during both the learning process (in the classroom), and leisure time (at recess in schools, and in the playrooms in kindergartens). In total, more than 300 and 255 classes were attended at school and kindergartens, respectively.

The survey was conducted among parents of the children. The parents indicated their satisfaction or dissatisfaction with the program of the school or kindergarten, pointed out the possible causes of child aggression, pointed out the time each child spends on the Internet or playing computer games.

The academic progress was determined based on the average score. There are three grades of academic performance: high (average score above 10 points), average (from 7 to 9) and low (up to 7 points). This category includes children of primary school who have systematic lessons.

The social and general education lessons were provided for children on the second year. The parents also had 51 lessons on the second academic year. The lessons included the basics of child psychology, the improvement of deviant behaviour (aggression) in a family, as well as methods of limiting the time spent playing computer and video games and watching cartoons and entertainment video content on the Internet (primarily on the YouTube service).

The aggressiveness is understood as behaviour when a child performs destructive actions - causing physical or other harm to people, animals, plants or inanimate objects. There are the following types of aggression: physical (causing physical damage as a result of a fight, bites, pinching, etc.), and direct - when it is directed against a specific person. Moreover, there is verbal aggression, mainly, the use of obscene words, offensive nicknames. Indirect aggression is associated with damage without the direct

participation of the opponent: spreading rumors, damaging property, and inciting other children to act aggressively against a particular child. The instrumental aggression aimed at taking possession of some object belonging to another child. The instrumental aggression is directly related to the emergence and consolidation of the concept of "friend or foe". The altruistic aggression is when a child protects the other from the aggressive actions of children. Finally, auto-aggression is an aggression directed against oneself, while the child may self-harm or deliberately engage in self-deprecation.

# Statistical analysis

The data was processed with the Microsoft Excel 2016 database (Microsoft Inc., USA). Further data processing was carried out using the statistical analysis program Statistica v. 6.0 (StatSoft Inc., USA). Data (types of aggression, parental responses, academic performance) are presented in the number of participants (the number of children in each category, by signs of aggressiveness) and in % (parental responses to the questionnaire, distribution of children by academic performance). The correlation was calculated according to Spearman's rank. The differences were determined by the Mann-Whitney test. The data were significantly different at $p \leq 0.05$.

## Results

The significant improvement of student performance has been achieved (Fig. 1). Thus, the average academic performance had no significant changes ($p \geq 0.05$). Meanwhile, the number of students with high academic performance significant increased by 1.4 times ($p \leq 0.05$) from 2018 to 2019.

There were no significant changes for children with low academic performance. The number decreased by 1.3 times in 2019 ($p \leq 0.05$). The increase in the number of students with high academic performance was due to students with average academic performance. A part of the students with low academic performance moved to average academic performance group. Apparently, the groups with low and high academic performance are more mobile. Meanwhile, due to the group of students with average academic performance, the number of students from the first two groups changes.

An analysis of aggression among preschool and primary school children showed significant differences between the four groups (Figs. 2 and 3). The predominant types of aggression for preschoolers are instrumental, verbal, and also indirect (Fig. 2). Thus, the level of aggression in the control group decreased during 2018–2019.

The instrumental aggression decreased by 1.6 times ($p \leq 0.01$), indirect − 1.2 times ($p \leq 0.05$), and verbal − 1.2 times ($p \leq 0.05$) in the experimental group. More significant changes were recorded in the control. Thus, the instrumental aggression decreased by 1.7 times ($p \leq 0.01$ comparing to 2018), indirect − 1.9 times ($p \leq 0.01$), and verbal − 1.4 tomes ($p \leq 0.01$).

There is a significant difference between the control and experimental groups throughout the entire study period. The level of aggression of preschoolers is 1.3–1.6 times higher in the experimental group than in the control ($p \leq 0.05$). Thus, the experimental group children are more aggressive than the control group

children, even after psychological and pedagogical lessons. Similar trends were found among children of primary school age (Fig. 3).

Thus, the level of aggression also decreased in the experimental and control groups during 2018 to 2019. In the control group, verbal, indirect and direct aggression prevailed. In 2019, their level decreased by 1.4 times ($p \leq 0.05$), 1.6 times ($p \leq 0.01$) and 1.5 times ($p \leq 0.05$), respectively. The same indicators in the experimental group decreased to a lesser extent (1.2 times ($p \leq 0.05$), 1.2 times ($p \leq 0.05$), and 1.3 times ($p \leq 0.05$)). Thus, a less significant decrease in aggression was obtained in the experiment comparing to the control. Some children from both age groups had several types of aggression, e.g. direct and indirect, instrumental and verbal. Parents from the control group initially (in 2018) were more responsible and better at compromising (Fig. 4).

Majority of parents only partially admitted the fact of children's aggression, or did not take this factor seriously. Moreover, most parents shift their responsibility to kindergarten and primary school teachers. The attitude of the parents changed after the lectures and meetings with psychologists at the time of 2019. There were 1.2 times more parents willing to cooperate ($p \leq 0.05$) in the group of preschoolers and 1.4 times – in the group of primary school children ($p \leq 0.05$). The number of aggressively minded parents decreased in both age groups by 1.2 and 1.4 times, respectively. There are differences between the answers of parents of preschool children in the control and experimental groups. The parents of the control group were 1.2–1.5 times more cooperative and admitted their mistakes in raising children comparing to the experimental group ($p \leq 0.05$). The same trend was observed for the parents of primary school children.

The correlation between the aggressive behavior of the parents and the aggression in children was 0.7 in the control and 0.9 in the experiment. The initial division into groups based on the results of a survey was successful. The children who spent all their free time playing video games and on the Internet were more aggressive. Moreover, they are hard to educate. Parents of such children are reluctant to admit their mistakes and to cooperate with specialists.

# Discussion

The data obtained prove that the child’s aggression is associated with the time spent on the Internet and the attitude of their parents. Children, with verbal aggression, used profanity not to demonstrate their "knowledge" in this area, but to assign offensive nicknames, negative characteristics, actions or failures. Some parents deny the problem and consider normal for the child to use foul language. Some blame their relatives or neighbors. This is a permissive education [25, 26]. The reason may be that parents grew up in the conditions of a severe economic crisis in the late 90 s of the last century occurred on the territory of the former USSR. Nowadays, parents often try to distract the child's attention with the help of the Internet or video games.

The improvement of academic performance and reduce of the aggression were achieved through the joint work of teachers, psychologists, and parents. Admitting the aggressive behavior and inability to

solve problems were important for improving children's mental health [27, 28]. Moreover, the aggressive behavior is associated the child's leisure, namely, the constant presence surfing on the Internet and playing video games. The child loses touch with reality and cannot adequately respond to external stimuli. This correlation between aggressive behavior and spending time on the Internet has been studied in other works. In particular, children spending more time on the Internet (mainly, social networks) become lethargic, indecisive, live in fear of external stimuli in adolescence [29, 30]. Thus, it leads to nervousness, then hysteria or outright aggression. Such "socialization" is the main cause of bullying and other forms of aggressive interactions among adolescent children. The instrumental aggression and verbal aggression prevail among preschool and primary school children. This is primarily due to the fact that children, when moving from kindergarten to school, find themselves in a stressful situation. Aggressiveness of children is not only a problem of school or kindergarten, but also a problem of the whole society. Therefore, it is necessary to improve the mental health of children at any education institution.

# Conclusion

The conducted research confirmed the importance of complex actions in reducing the aggressiveness and improving the mental health of children. The joint work of psychologists, parents and children themselves gave positive results. The control groups children significantly faster reduced aggressiveness by 1.4–1.6 times, on average, comparing to the experimental groups (1.2 times, $p \leq 0.05$). The aggressiveness of children is associated with a lack of parents' attention, that leads to uncontrolled surfing on the Internet and playing video games. The experimental group children demonstrated aggressive behavior 1.5–1.7 times more frequently than children from the control group ($p \leq 0.01$). The survey of parents showed the same tendency. Thus, connivance of aggression and an aggressive reaction to communication with teachers were more significant (0.5–0.7 times, $p \leq 0.05$) in the experimental group compared with the control. The improvement of the behaviour of children was successful already after a 1 year of the experiment. The academic performance improved, while aggressiveness decreased in all groups.

# Declarations

### Ethics approval and consent to participate

The research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki. The research was approved by the local ethics committees of The Ministry of Health of the Russian Federation "I.M. Sechenov First Moscow State Medical University" (Protocol No 7 of 14.05.2020).

### Consent for publication

Informed consent was signed by parents of the children. Parents gave their consent to the processing and publication of information, subject to the anonymity of the participants.

### Availability of data and materials

The data analysed during the current study are available from the corresponding author on reasonable request.

### Competing interests

The authors declare that they have no competing interests.

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### Authors' contributions

VSp and VS analyzed and interpreted the patient data. IS made formal analysis and analyzed resources. IA was a major contributor in writing the manuscript. All authors read and approved the final manuscript.

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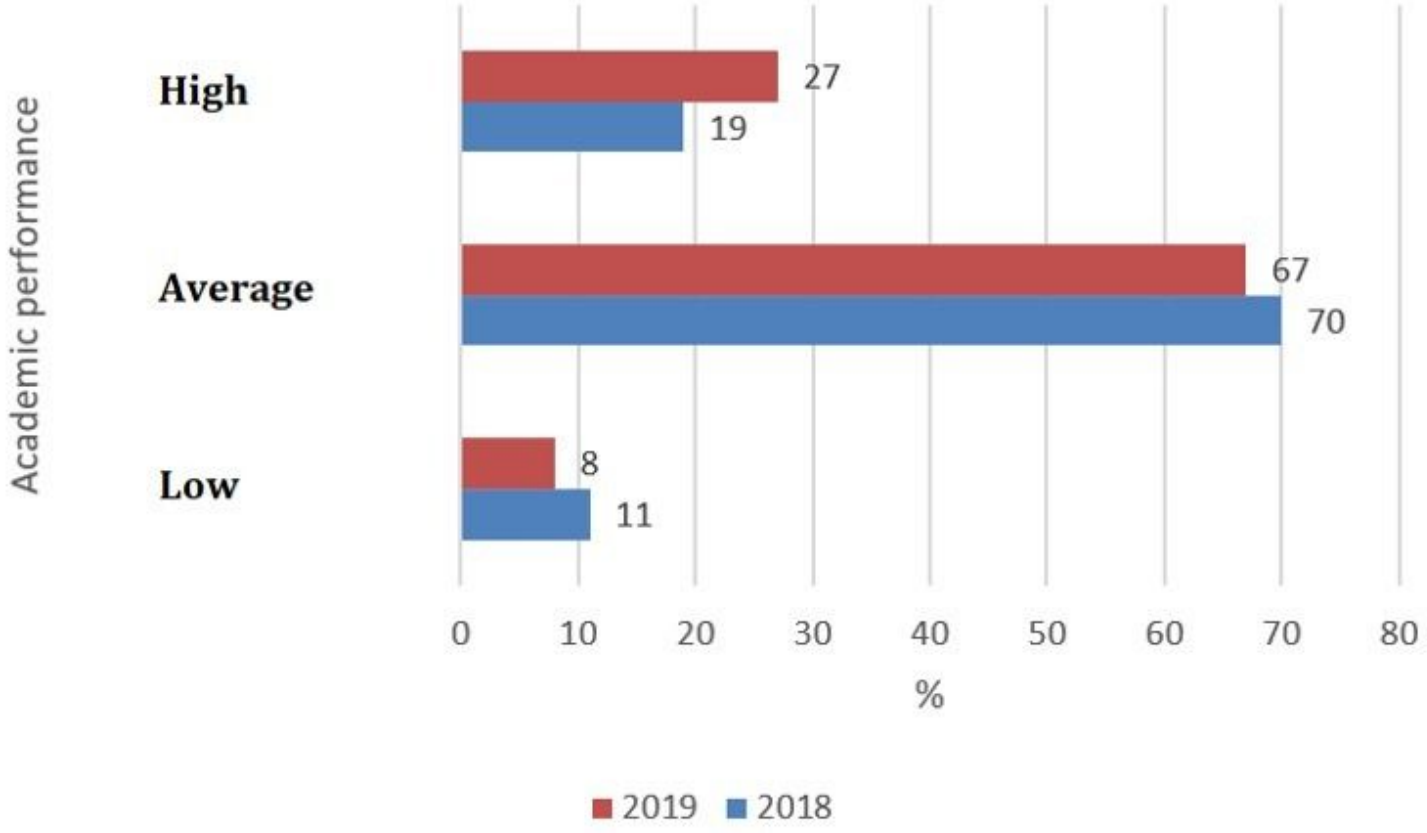
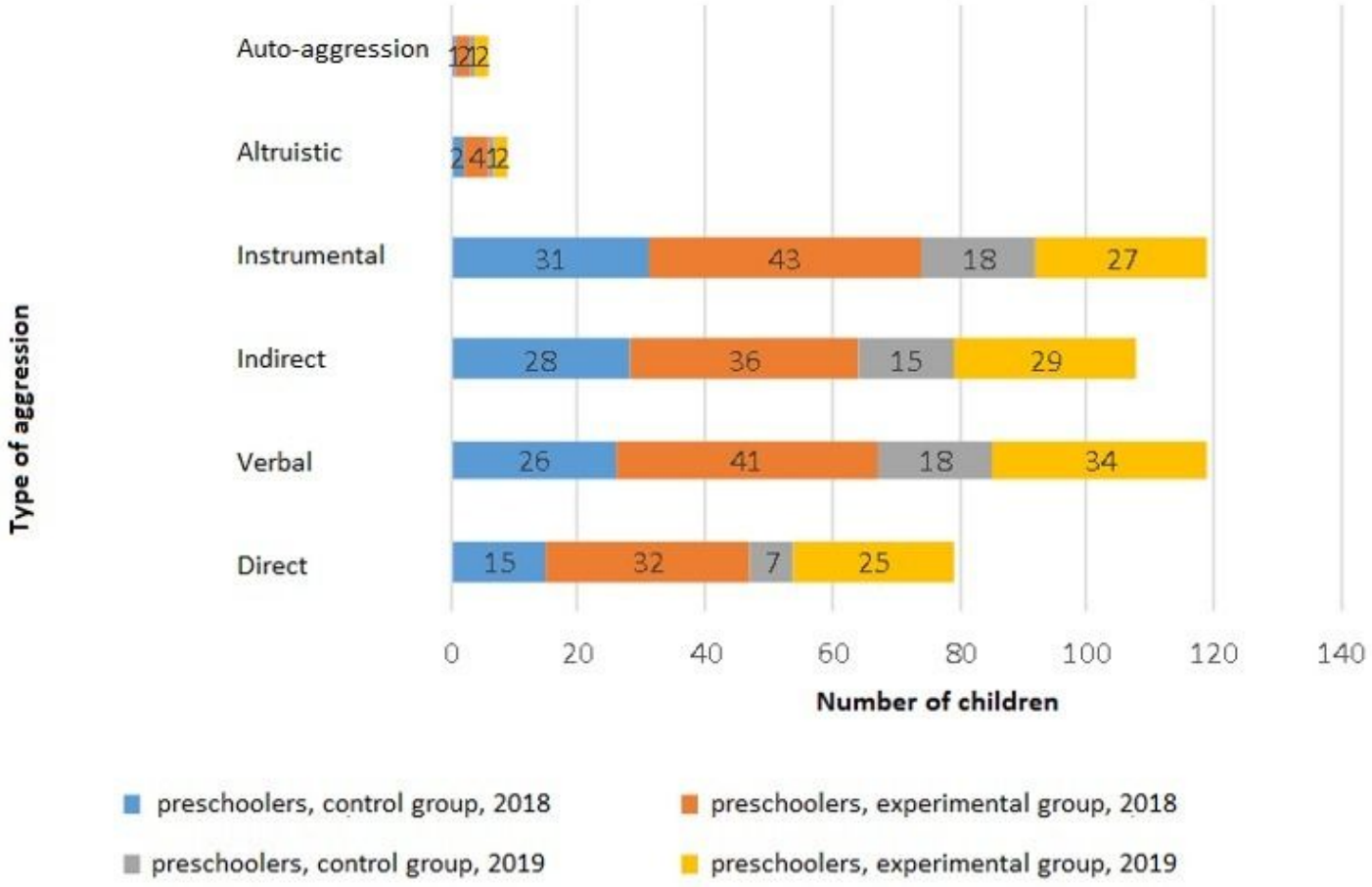
# Figures



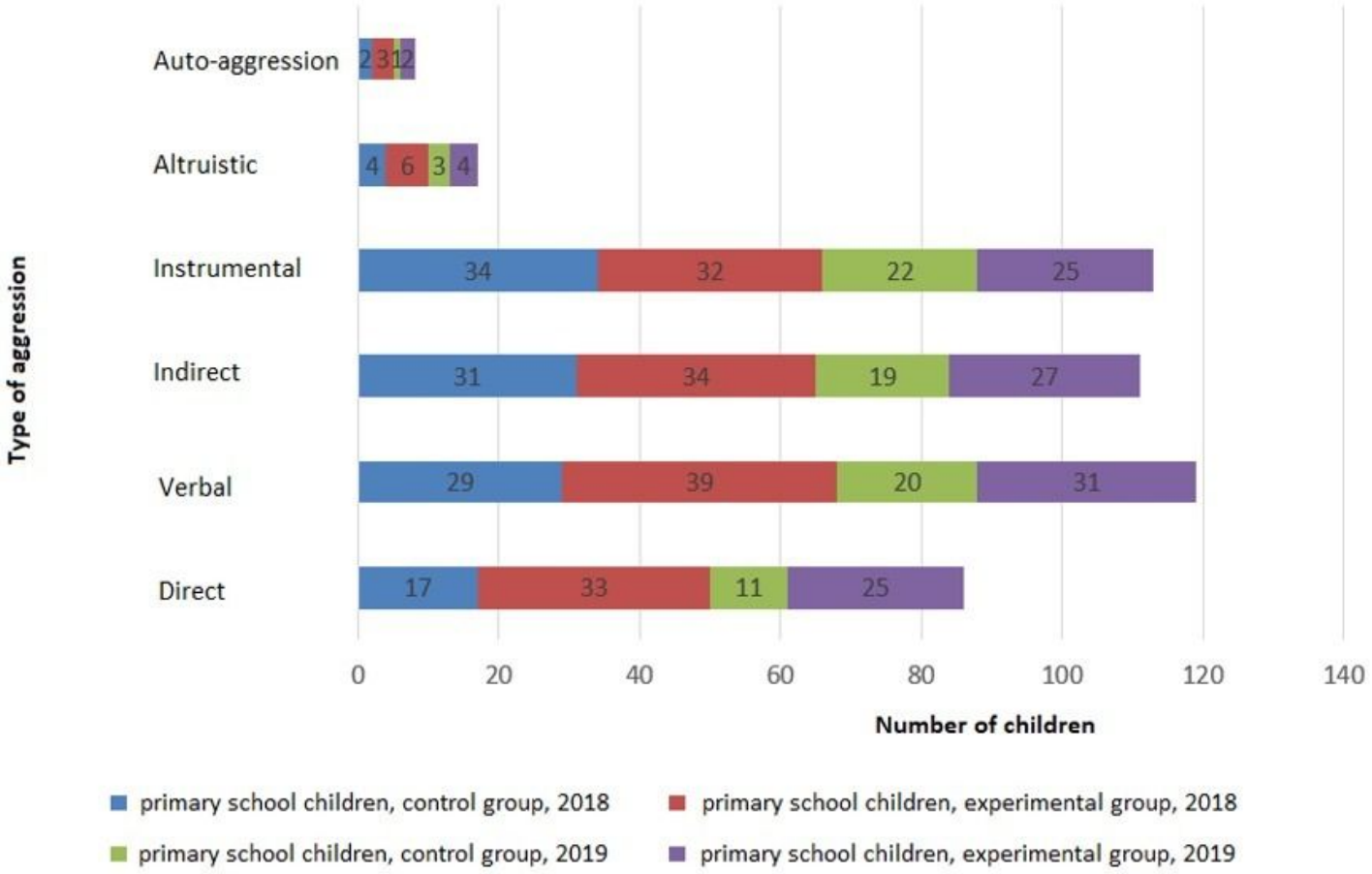
## Figure 1

Change in the academic performance of primary school children in 2018-2019 (in %)



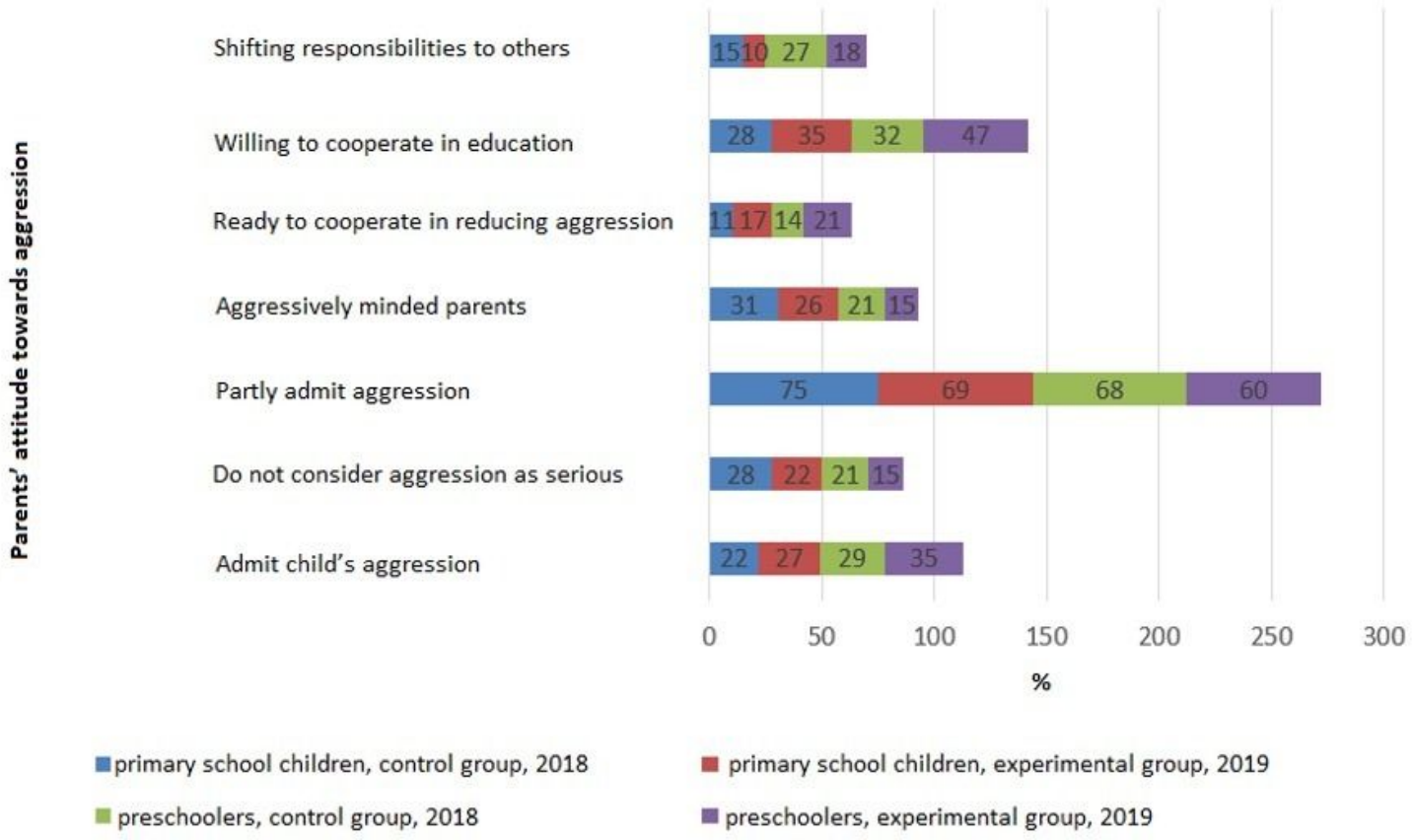

## Figure 2

Levels of aggression (in %) among preschoolers of the control and experimental groups in 2018-2019




## Figure 3

Levels of aggression (in %) among primary school children of the control and experimental groups in 2018-2019




## Figure 4

The attitude of parents towards aggression among (in %)