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MÁRTA GELENCSÉRNÉ BAKÓ¹ – DÓRA ULLMANN²**The effect of canine therapy on the development of social and emotional areas in children with learning disabilities in school age**

The goal of our research is to investigate the impact of canine therapy on the development of children with learning disabilities, with special regard to social and emotional competence. The research question was: to what extent does intensive animal-assisted therapy influence the behaviour of the pupils enrolled in the sample, and can the long-term effects of the therapy be demonstrated and justified? To explore the longitudinal study over six months, a qualitative and quantitative test method was used. As a research tool, we used the Conners Questionnaire on Child Behaviour, which was revealed by descriptive and mathematical statistical analysis. Owing to the multi-focus study, the positive effects of canine therapy were confirmed from several sides. Based on the results we can prove that the canine therapy positively and lastingly influenced the behaviour of the examined children, which showed a positive change in several areas.

Positive effects of animals on humans

The development of animal-assisted therapy can be traced back to 1912, when animal-assisted treatments were used in a mental health program at St. Elizabeth's Hospital in Washington (Bánszky–Kardos–Rózsa–Gerevich, 2012), later the presence of animals was included in the treatment of somatic patients (Topál and Hernádi, 2011).

At a conference of the American Psychological Association in New York in 1960, Levinson reported on his discovery that in a little boy, he was only able to break down the communication and psychological barriers that prevented contact through the presence of the dog. Levinson's name is associated with the creation of the concept of "pet therapy", which can be dated to 1964. (Klimke, 2001, p. 17)

Babos (2013) writes that the mental well-being of people is supported by unconditional acceptance and love from animals. We are able to share our sorrow, the sadness with them, to which they react compassionately and provide comfort in difficult times. It is due to these factors that the presence of animals reduces anxiety and feeling of loneliness. In a stressful

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situation, animals are able to divert people's attention to more pleasant things, thus contributing to a calmer state.

Children reach out of the stroller without fear after everything that flies or passes them, writes Klimke (2003). If we look at the plush stock of young children, we can see that countless dogs, cats, young calves, donkeys, etc. are between them. Kids simply love animals.

Surveys have shown that about 80% of families accept an animal because of their children. The most common reason for this is that parents believe that animals enhance children's sensitivity, sense of responsibility, and serve as companions for them (Becker & Morton, 2002).

The positive effects of involving animals in the classroom are reported by Zassloff et al. (1999), students have better self-image, attitudes toward school, adults, and animals. Rud and Beck (2003) in their study, animals help the learning process as a natural stimulus, increasing the effectiveness of learning. Molnar et al. (2019) students' anxiety was studied in schools in Kaposvár. The effect of the dwarf rabbit showed a significant decrease.

The impact of canine therapy on the social and emotional areas of children with learning disabilities

The definition of „learning disability” was determined by Zsuzsa Mesterházi as follows: *„To the group of children with learning disability belong the children, which due to weaker function abilities of the nerve system owing to biological and/or genetical reasons and due to unfavourable environmental effects show permanent, comprehensive learning difficulties, learning ability dysfunctions”* (Mesterházi, 1998, pp. 17–20). Learning disability is ungeneralized, it occurs on every field of learning comprehensively, permanently and heavily. In every case long-lasting developing and therapeutical care is required. The problems can occur during perception, execution and on the social-emotional area as well.

The use of the Animal-Assisted Interventions (AAI) for special pedagogical purposes has been around for a long time (O'Haire, M. E, 2012).

According to Klimke (2003), animals have a significant influence on the development of emotional intelligence. In times of emotional crisis, children, wherever they live, turn to animals primarily for help. Animals provide emotional support for children to help them go through a major emotional trial. A survey in 1985 found that 75% of children between the ages of ten and fourteen turn to animals when they are sad. Another study also found that those who received/receive significant emotional support from their animals were less impatient or withdrawn. In these difficult times, children receive from animals what they need: attention,

reassurance, and companionship (Becker & Morton, 2002). This is why the sentimental and emotional effects of canine therapy are emphasized. For the child, the feeling as well as the awareness that it is able to control a dog also significantly increases its self-confidence and self-esteem (Babos, 2013). Thanks to the dogs' gratitude and positive feedback, the consciousness of importance is strengthened and it helps social-emotional development as a social support (Fenyvesiné & Gelencsérné, 2015).

Animals do not judge, but approach and are devoted to man unconditionally. The relaxed state into which children are placed during therapy results in a sense of inner calm, which reduces tension on the one hand and anxiety on the other. Reaching this state is explained by the biophilic hypothesis, the essence of which is that the sedative effect of dogs can be traced back to their historical role when they were responsible for perceiving the source of danger. If a dog behaves calmly, it is a sure sign that there is no danger nearby (Babos, 2013).

A study by Dr. Becker and Morton (2002) between 1983 and 1992 demonstrated that animals, including the dog, develop children's empathic skills, that is, their ability to empathize with and react to other people's mental state accordingly. We have long been aware of the fact that dogs make it easier to connect because they are full of energy and this in itself makes children more proactive with others, thereby also reducing their social isolation.

Due to anxiety as well as a decrease in tension, a calmer behaviour appears instead of aggressive behaviour. The dog is able to sense the current condition of its owner or client and behave accordingly. As a result of this, children will also be more sensitive to environmental problems (Fenyvesiné & Gelencsérné, 2015).

The research

Methods

The aim of the research is to explore the impact of canine therapy on the development of children with learning disabilities, with particular reference to social and emotional competence in the study population. It was formulated as a research question: to what extent does intensive animal assisted therapy influence the behaviour of the studied pupils, and can the longer-term effect of the therapy be demonstrated?

In order to explore the longitudinal study qualitative and quantitative test methods were used. Thanks to the multi-focus study, we obtained confirmation from several sides about the effects on canine therapy. Based on the revealed results, it can be said that based on the opinions of the interviewed professionals the development of children in several areas is greatly

promoted by participation in canine therapy. This was supported by the results of the *Conners teacher version* of the *Children's Behaviour Questionnaire for Pupils* and the mathematical statistical analysis showing that canine therapy had a positive and longer-lasting effect on the behaviour of the children studied.

Analysis of children's behavioural questionnaire

In the research, we used the questions of the child behaviour questionnaire for the purpose of impact assessment, so that the research question would gain certainty about the effect of dog therapy on the developmental change of children with learning disabilities. The survey site was provided by the methodological centre of a county-level city, where a class teacher of fifth-graders with learning disabilities completed a teacher version of the Children's Behaviour Questionnaire (Conners) for pupils. Thirteen pupils participated in the research, which lasted six months (November, December, April). The children received intensive canine therapy for two months, during which we monitored the developmental changes, and then we wanted to support the long-term effect of canine therapy with the April questionnaire. The questionnaire completed by the class teacher contained 28 statements with overlaps between them. In terms of responses, there were 4 options, 0 (never, rarely), 1 (sometimes), 2 (often), and 3 (very often), which had to be marked based on changes in pupil behaviour. During the preparation of the tables, 6 behavioural aspects were highlighted from the questionnaires.

Key monitoring aspects:

- inattentive, easily diverted
- restless, fidgeting
- actively opposes or refuses to comply with adult requests
- outbursts of rage are common, its behaviour is flammable, unpredictable
- irritable, impulsive
- restless, constantly bustling.

Table 1 shows the results of pupils A, B, C, D, E, and F. The legend is as follows: 0 (never, rarely), 1 (sometimes), 2 (often), 3 (very often).

The first person presented was A., who turned 13 during the research. On the area of it *actively opposes or refuses to comply with adult requests*, the change can be seen already after the first month, with a long-term effect. Similar changes were observed by the class teacher in terms of *irritability and impulsivity*.

B. 12-year old, changes can be seen in three aspects. The first is *inattention, easily diverted*, the second is *restless, fidgeting*. The third area of development is *restless, constantly bustling*. The long-term impact of the classes can be demonstrated, which is supported by the April data.

About 13 years old C. there are November and December data on the pupil, because we were no longer able to record the month of April due to moving. There has been an improvement in *irritability and impulsivity* over the two months.

D. 11 years old, for whom we can highlight two areas in terms of development. There is a positive change in the area of *inattentive, easily diverted*, and *frequent outbursts of anger and unpredictable behaviour*. The long-term impact of the development is confirmed by the April data.

In 12-year-old E., *flammable, unpredictable behaviour* decreased as a result of canine therapy, which can also be observed in April. Development and long-term effects can also be experienced on the area of *actively opposing or refusing adults request*.

F. is 13 years old. Based on the behavioural questionnaire completed by the class teacher, we see progress in four areas. In the areas of *inattentive, easily distracted, restless, fidgeting, flammable, unpredictable* and *irritable and impulsive* behaviour. Positive change and long-term impact can also be demonstrated in the areas.

pupils	A			B			C			D			E			F		
months	Nov	Dec	Apr	Nov	Dec	Apr	Nov	Dec	Apr	Nov	Dec	Apr	Nov	Dec	Apr	Nov	Dec	Apr
Inattentive, easily diverted	1	1	1	2	1	1	2	2		2	1	1	0	0	0	2	1	1
Restless, fidgeting	0	0	0	1	0	0	1	1		1	1	1	0	0	0	1	0	0
It actively opposes or refuses to comply with adult requests	1	0	0	0	0	0	1	1		1	1	1	1	0	0	0	0	0
Outbursts of rage are common, its behaviour is flammable, unpredictable	0	0	0	0	0	0	0	0		2	1	1	1	0	0	1	0	0
Irritable, impulsive	1	0	0	0	0	0	1	0		1	1	1	0	0	0	1	0	0
Restless, constantly bustling	0	0	0	1	0	0	0	0		1	2	1	0	0	0	0	0	0

Table 1, Presentation of development results (pupils A, B, C, D, E, F)

Table 2 shows the results of pupils G, H, I, J, L and M. The legend is as follows: 0 (never, rarely), 1 (sometimes), 2 (often), 3 (very often).

In the case of *G.*, who is 12 years old, there has been a change in the *inattentive, easily diverted* area, the long-term appearance of which is confirmed by the April data.

In the case of the 12-year-old pupil *H.*, we can see progress in the *inattentive, easily diverted*, and *restless, fidgeting* area, the lasting effect of which was also confirmed by the April responses given by the teacher.

I. at the age of 12, the educator experienced a positive change in the positive direction of the *inattentive, easily diverted*, and *restless, constantly bustling* area and the sustainability of the development.

J. is also 12 years old. It struggled with significant behavioural problems in terms of his behavioural tendencies. There is a significant change in the *restless, constantly bustling* statement when looking at the December data. A similar change can be reported in the *irritable, impulsive* area, where the long-term effect of better results was also felt by the educator in April. In the case of *unpredictable, flammable* behaviour, a more unfavourable result was achieved in April after stagnation.

Student *L.* turned 13 during the research, similarly to the previous pupil. In terms of development, we highlight two areas. The first is *inattentive, easily diverted*, the long-term impact of which is also confirmed by the April data. The other significant change and long-term effect is seen in the *restless, fidgeting* statement.

M. is 13 years old. The statement of *actively opposing adults* showed an evolving trend due to the therapy, the long-term effect of which was also felt by the educator.

K. pupil's data were not displayed in the table. It turned 13 years of age during the studies. The relevant data relate to November as well as December, as it was no longer able to be present during the survey taken in April due to relocation. There was an improvement in *irritability and impulsivity*, which was given a "never" rating by the teacher in December after the "sometimes" rating in November.

pupils	G			H			I			J			L			M		
months	Nov	Dec	Apr	Nov	Dec	Apr	Nov	Dec	Apr	Nov	Dec	Apr	Nov	Dec	Apr	Nov	Dec	Apr
Inattentive, easily diverted	2	1	1	2	1	1	1	0	0	1	1	1	2	1	1	0	0	0
Restless, fidgeting	0	0	0	1	0	0	1	1	1	1	1	1	2	0	0	0	0	0
It actively opposes or refuses to comply with adult requests	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0
Outbursts of rage are common, its behaviour is flammable, unpredictable	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0
Irritable, impulsive	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	0
Restless, constantly bustling	0	0	0	0	0	0	1	0	0	3	1	1	0	0	0	0	0	0

Table 2, Presentation of developmental results (pupil G, H, I, J, L, M)

An important aspect of the research was the study of the effect of canine therapy on children with learning disabilities. The results revealed during the written interview were encouraging in terms of research effectiveness from several perspectives. Development and its long-term effects were observed in several cases in the child. Of the six areas evaluated in the study, the *inattentive, easily diverted* aspect showed the most positive development. In five children, we experienced changes in *irritability and impulsivity* and in the *restless, fidgeting* manner, the behaviour of four children changed.

In the course of the research, we examined the development trends of the two-month run-down period, as well as the long-term effect covering four months, but already during this short period of time we proved a favourable development. Indicators obtained during the study confirm that canine therapy significantly influences the social and emotional development of children with learning disabilities along with all factors influencing development. This is supported by the mathematical statistical test presented in the next subsection.

Results of a two-sample paired (self-controlled) T-test

The pupils Child behaviour questionnaire (Conners) - teacher version incoming data were also processed by two-sample paired (self-controlled) T-test statistical analysis. We sought evidence for the likelihood that canine therapy has a developmental effect on the behaviour of pupils with learning disabilities. During the processing, we compared the data of six months (November, December, April), during which the pupils received intensive dog therapy, as well

as the results of April, where we examined the long-term effect. Two results are highlighted in the studies, the expected values and the double-edged value $P (T \leq t)$. In the evaluations, we examined the results received for all 28 statements, and then the focus was on the six statements presented in detail above.

In the first T-test, we took into account the results obtained in the 28 statements for all 13 pupils, comparing the months of November and December, respectively (see Table 3). At the expected values, a significant change can be observed, which supported the beneficial effect of canine therapy. The expected value was still 16,153 in November, however, this decreased significantly by December and produced a result of 12. It is important to highlight the double-edged value $P (T \leq t)$ generated during the course of the program, which helped to determine the probability. Since the value of $P (0.01)$ is less than 0.05 ($0.01 < 0.05$), it shows a significant value, so we can conclude that students' behaviour is most likely to change positively due to dog-assisted occupations through the period considered.

	November	December
Expected values	16.153	12
$P (T \leq t)$ double-edged	0.01	

Table 3, Results of the November and December T-tests for 28 statements

During the second trial, the focus was on the long-term effects of canine therapy with data from December and April, respectively. Data from 11 children were taken into account in this study, as two pupils were no longer present at the time of the April data collection due to moving. In terms of values, as shown in Table 4, there was minimal modification that strengthens the long-term effect of therapeutic sessions. We got a result of 10,818 in December, the month of April produced a value of 10.454. The changes in pupils that emerged as a result of two months of intensive canine therapy were noticeable even in April. It can be stated that the P value (0.76) is greater than 0.05 ($0.76 > 0.05$) based on the data, according to which the difference is not significant, so the behavioural changes showed stagnation.

	December	April
Expected values	10.818	10.454
$P (T \leq t)$	0.76	

Table 4, Results of the December and April T-tests for 28 statements

The next T-test focused on the November and April data for the size of the variable in terms of the two-month outcome. There was a significant change in the April values when examining the data of the 11 pupils, which is shown in Table 5. While the expected value was 15,727 in November, this result reduced to 10,818 by April. The value of $P (0.009)$ should also be

emphasized, from which it can be read that the difference is significant, as it is significantly less than 0.05 ($0.009 < 0.05$), so the measured result is significant.

	November	April
Expected values	15.727	10.818
P (T<=t) double-edged	0.009	

Table 5, Results of the November and April T-tests for 28 statements

From the data received from 28 statements averages were also calculated, as shown in Figure 1. It is clear from the chart that the pupils underwent a significant change in the months of November and December, respectively. Examining the data of all 13 pupils, the value of 16.15 in November changed to 12.00 in December, which confirms the positive effect of canine therapy on the development of children. Considering the value of the month of April (10.45), there was no significant change in the pupils, so the positive effects that canine therapists achieved in the pupils were retained.

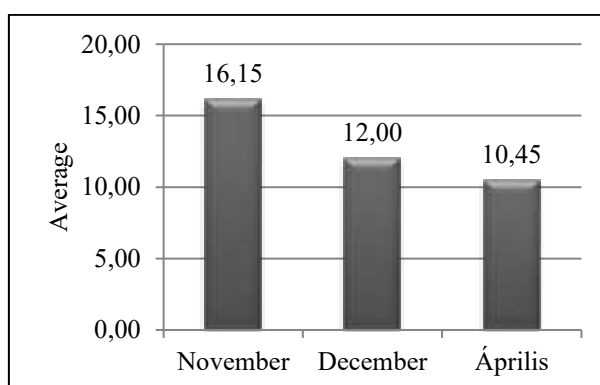


Figure 1, Average of the values received for 28 statements

In the subsequent T-tests, we considered the six statements that were authoritative for the research.

Key monitoring aspects:

- inattentive, easily diverted
- restless, fidgeting
- actively opposes or refuses to comply with adult requests
- outbursts of rage are common, its behaviour is flammable, unpredictable
- irritable, impulsive
- restless, constantly bustling.

During the first program, we worked with the results of 13 pupils with the data of December and November, respectively. It can be stated that, similarly to the previous trials, a positive

change was observed. The expected value in November fell to 3,769 while in December it fell to 2,076. Also worth highlighting is the P value (0.0002), which is less than 0.05 ($0.0002 < 0.05$), so it can be said that the difference is significant and the positive developments are owing to the participation in canine therapy. (see Table 6)

	November	December
Expected values	3.679	2.076
P (T<=t) double-edged	0.0002	

Table 6, Results of the November and April T-tests for six statements

Evaluating the December and April data of 11 pupils (Table 7), there was stagnation in the six statements that testify to the long-term effects of canine therapy. For both months, the expected value is 1,909 and the P value (1) is greater than 0.05 ($1 > 0.05$), indicating no difference.

	December	April
Expected values	1.909	1.909
P (T<=t)	1	

Table 7, Results of the December and April T-tests for six statements

Looking at the November and April data of the 11 pupils received for the six statements, it can also be reported that the values are significant. Thanks to dog-assisted activities, the results in the children were also felt in April, according to the class teacher. In November, the expected value was 3,727, which went through a significant decline and changed to 1,909. Regarding the P value (0.0004), it can be said that the difference is authoritative as it is less than 0.05 ($0.0004 < 0.05$), which is illustrated in Table 8.

	November	April
Expected values	3.727	1.909
P(T<=t)	0.0004	

Table 8, Results of the November and April T-tests for six statements

From the data received for the six statements, an average was calculated, the results of which supported the beneficial effect of canine therapy, taking into account the data of 13 pupils in November and December, respectively. In November, the result of 3.77 underwent a significant decline, and finally in December, due to the therapeutic hours, we obtained a value of 2.08. The April average of 1.91 confirmed the long-term effect on 11 pupils, as it did not result in a significant difference between the December and April data (Figure 2).

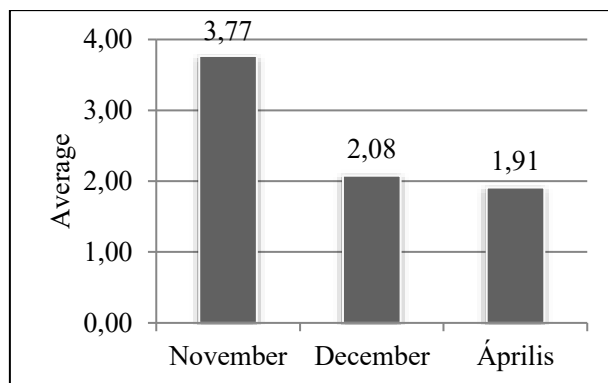


Figure 2, Average of the values received for six statements

Regarding the values of the two-sample (self-controlled) T-test, we can say that we obtained positive results, which confirm that canine therapy had a beneficial effect on the development of social and emotional competencies of children with learning disabilities, even at a time interval of a few months. Looking at two months of development, but taking six months into account, the pupils underwent a significant change that the class teacher perceived also in April. In the case of the T-tests performed on 28 and 6 statements, respectively, actual modifications were observed, which confirmed the positive and long-lasting influencing effect of canine therapy by mathematical statistical analysis.

Summary

The aim of our research is to investigate the effect of canine therapy on the development of children with learning disabilities, with particular reference to social and emotional competence. It was formulated as a research question: to what extent does intensive animal assisted therapy influence the behaviour of the studied pupils, and can the longer-term effect of the therapy be demonstrated?

In order to explore the longitudinal study qualitative and quantitative test methods were used. Owing to the multi-focus study, the positive effect on canine therapy was confirmed from several sides. Based on the revealed results, it can be stated that based on the opinions of the interviewed professionals the development of children in several areas has been greatly promoted by participation in canine therapy. This was supported by the positive change in the Conners questionnaire for pupils, a two-sample (self-controlled) T-test values, as a result of which canine therapy had a positive and long-lasting effect on the behaviour of the studied children. The pupils underwent a perceptible change - two months of intensive canine therapy - the effect of which can be measured even in April. We obtained a statistically validated answer

to the research question raised here, according to which canine therapy has a positive and demonstrable effect on the components of children's behaviour after several months.

The research goal has been achieved, and we received evidence that canine therapy has a developmental effect on the social and emotional aspects of pupils with learning disabilities. The research results confirm our belief that there is an excellent opportunity in our hands to involve animals, it is up to us whether we live with it or not.

Our long-term goal is to prove the importance of animal-assisted pedagogy and the possibility of incorporating it into public education through further research in addition to canine therapy.

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