

Effects of animal-assisted education on reading with a group of elementary students

Efeitos da educação assistida por animais na leitura com um grupo de alunos do ensino fundamental

Efectos de la educación asistida por animales con la lectura en un grupo de alumnos de primaria

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Abstract

Introduction: Animal assisted education (AAE) disseminates the use of animals as pedagogical resource. Dog-assisted reading is the most researched intervention in AAE and its results show improvement in student reading performance in the presence of therapy dogs. **Objective:** Describe the effects of AAE in reading motivation and performance for a group of 5th graders. **Method:** The study had the participation of 6 subjects averaging 10.9 years old - 2 males and 4 females - in a 5th year classroom of a municipal school. The research was experimental, interventional and qualitative. Each subject participated in six 20-minute read aloud sections, the first five with and the last one without the presence of the dog. Before the sessions, the subjects answered the questionnaire about the contact with animals and reading activities and after the sessions, the questions regarding the relation between AAE and reading. The answers were described to construct the individual profiles and the sessions were analyzed through content analysis categories *a posteriori*, according to the incidence and relevance in relation to the objective of the research. **Results:** According to the self-perception of the 6 subjects, their readings skills improved after the sessions. Four out of six subjects started reading more frequently. **Conclusion:** The results obtained suggest that Animal Assisted Education may improve student performance by positively impacting the self-perception of their reading skills.

Keywords: Education; Reading; Learning; Education; Bonding, Human-Pet.

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Resumo

Introdução: A educação assistida por animais (EAA) difunde a utilização de animais como recurso pedagógico. A leitura assistida por cães é a intervenção mais pesquisada na EAA e os resultados apontam melhora no desempenho de leitura de alunos na presença de cães terapeutas. **Objetivo:** Descrever os efeitos da EAA na motivação e no desempenho em leitura de um grupo de alunos do 5º ano do Ensino Fundamental. **Método:** Participaram 06 sujeitos com média de 10,9 anos, 02 masculino e 04 feminino, alunos do 5º ano de uma escola municipal. Trata-se de pesquisa experimental, de intervenção, qualitativa. Cada sujeito participou de 06 sessões de leitura em voz alta com duração de 20 minutos, as cinco primeiras com e a última sem a presença do cão. Previamente, os sujeitos responderam ao questionário relativo ao contato com animais e atividades de leitura e pós sessões, sobre relações entre a EAA e leitura. As respostas foram descritas para traçar os perfis individuais e as sessões foram analisadas por meio de categorias de análise de conteúdo *a posteriori*, de acordo com a incidência e a relevância em relação ao objetivo da pesquisa. **Resultados:** De acordo com a percepção dos 06 sujeitos, suas habilidades de leitura melhoraram após as sessões e 04 passaram a ler com mais frequência. **Conclusão:** Os resultados obtidos sugerem que a Educação Assistida por Animais pode impactar benéficamente o desempenho de estudantes por operar, de forma positiva, na autopercepção frente às habilidades de leitura.

Palavras chave: Educação; Leitura; Aprendizagem; Vínculo Homem-Animal de Estimação.

Resumen

Introducción: La educación asistida por animales (EAA), difunde la utilización de animales como recurso pedagógico. La lectura asistida por perros es la intervención más investigada en EAA e los resultados apuntan mejora en el desempeño de lectura de alumnos en la presencia de canes terapeutas. **Objetivo:** describir los efectos de la EAA en la motivación y en el desempeño en lectura de un grupo de alumnos de 5º año de la primaria. **Método:** participaron 6 sujetos con una media de 10 y 9 años - 2 masculino y 4 femenino- de un salón de clases de 5º año de una escuela municipal. Se trata de una investigación experimental, de intervención cualitativa. Cada sujeto participó de 6 sesiones de lectura en voz alta, con duración de 20 minutos, las cinco primeras con y la última sin presencia del perro. En sesiones previas, los sujetos respondieron el cuestionario relativo al contacto con animales y actividades de lectura en sesiones posteriores, sobre relaciones entre la EAA y lectura. Las respuestas fueron descritas para trazar los perfiles individuales y las sesiones fueron analizadas, creando categorías de análisis de contenido *a posteriori*, de acuerdo con la incidencia y relevancia en relación con el objetivo de la investigación. **Resultados:** según la autopercepción de los 6 sujetos, sus habilidades de lectura mejoraron después de las sesiones. 4 de los 6 participantes pasaron a leer con más frecuencia. **Conclusión:** los resultados obtenidos sugieren que la educación asistida por animales puede impactar benéficamente el desempeño de estudiantes por operar, de forma positiva, en la autopercepción frente a las habilidades de lectura.

Palabras clave: Educación; Lectura; Aprendizaje; Vínculo Ser Humano-Animal.

Introduction

Education is always in a constant search for new approaches to promote and facilitate learning and/or motivate students to improve academic performance. In this perspective, the Animal-Assisted Education (AAE) proposes the use of animals as a pedagogical resource. AAE may be applied in multiple scenarios, within or outside the school, covering different age groups and different levels of development¹.

Different animal species can be used in these interventions, such as: cats, rabbits, turtles, horses, hamsters, birds and exotic animals, such as iguanas and snails². However, since there is a greater amount of studies on their behavior, dogs are more used because they have a high level of sociability, are easy to train and are accepted by people. In addition to having known and controlled zoonosis, making contact with humans safer^{3,4}.

The presence of the dog favors the development of positive feelings, exchange of affection, feeling of comfort and well-being in humans⁵, in addition to promoting the establishment of interpersonal bonds and enhancing verbal communication between the humans involved⁶; thus becoming a powerful catalyst for social interactions⁷.

Most of the studies involving children and dogs in the pedagogical environment report the impact of the dog's presence during reading activities, namely: improvement level of decoding and reading comprehension and in the reader's behavior in terms of readiness and motivation^{8,9}.

A bibliographic review of 27 articles on dog-assisted reading concluded that there is evidence of potential beneficial effects of reading for a dog: the presence of the animal affects many desirable human behaviors and also on the environment in which reading is performed, thus favoring the reader's performance¹⁰.

In addition to promoting emotional well-being, the contact with dogs also promotes desirable physiological changes, as it provides the release of B79 endorphins, oxytocin, prolactin, dopamine, among other hormones, producing a calming and relaxing effect¹¹; it also decreases cortisol levels with consequent decreased level of anxiety¹².

It should be noted that reading is a primary skill in modern society as it allows the relationship between students and also access to the world and sociocultural transmissions. As a key element

in education for the acquisition of knowledge, stimulation of thought and development of critical and conscious readers, reading comprehension is a factor that determines the adequate school performance¹³.

This study is unprecedented at the national level and focuses on the possibility of developing future criteria for the implementation of AAE in elementary education, using therapy dogs in individual reading sessions, since results of international research^{14,15} on the subject suggest that the presence of the dog may enhance the motivation and performance of students in relation to reading. This proposal aims to contribute to the collection of scientific evidence on the effectiveness of AAE in this context.

Given these aspects, this study aimed to describe the effects of AAE on motivation and reading performance of a group of students in the 5th grade of elementary school.

Methods

This is an experimental, pre- and post-intervention, qualitative research with multiple case studies. The project adopted the guidelines and regulatory standards for research involving human beings of the Brazilian National Health Council, resolution No. 466/12, and animal welfare¹⁶; in addition, the study relied on the availability of the institution where it was carried out and was approved by the Research Ethics Committee under no. 1.911.981. The guardians of all participants agreed and signed the Informed Consent Form (ICF). The identity of the participants was preserved and their names were withheld.

The study was carried out in a municipal school in São Paulo, with 12 classrooms and 65 employees, which provides elementary education from the initial grades. The study included 6 children (4 female and 2 male) with an average age of 10.9 years, who were in the 5th year of elementary school and attended the same classroom.

Inclusion criteria: subjects willing to participate in a reading activity with the researcher and who were interested and motivated to have contact with a dog.

Exclusion criteria: subjects diagnosed with disorders that affect cognitive and/or motor and/or psychological, allergic and/or phobic development

upon contact with dogs, according to the information provided by the school.

Selection of the participating dog: to ensure safety, it followed the proposed criteria of health, temperament and socialization¹⁷, namely: (I) assessment of the animal's temperament and behavior, evaluating the reactions to 11 strangers, reaction to loud sound and/or new stimulus, to aggressive voice or threatening gestures, to places crowded, to vigorous and awkward strokes, to strong embrace and reaction to other animals; (ii) training and ability to follow to commands; (iii) animal health - vaccines to control rabies and other zoonosis (V8 or V10), giardia and kennel cough - and monitoring and evaluation by a veterinarian to control fleas, ticks and parasites.

Given these criteria, the study selected a 6-year-old Golden Retriever dog called Lion, who has been acting as a co-therapist in AAE since the beginning of 2013 in hospitals, schools and other places.

After submission and approval by the school board and the regional board of education, two 20-minute visits were made with the dog selected to the study, without the presence of students so that he became familiar with the place.

At first, the students answered the questionnaire individually and orally in order to collect data related to the contact with animals and reading activities.

Then, each subject participated in 06 weekly 20-minute sessions of reading children's books aloud. The first five sessions included the dog, while the last session aimed to collect students' perceptions of the dog's absence.

All sessions were recorded on a digital camera for further analysis of the material relevant to the purpose of the project.

The book was selected as a textual support, as it is the most used in international reading projects with dogs and in research related to AAE. The selection of books followed criteria of typographic diversity and content related to the development of human values. The typographic diversity aims to create an invitation to reading. Typography influences readability; e.g., serif typefaces have greater contrast and, consequently, are more readable than those without serifs. Serif is the line or bar that ends each stem of certain letters, on one or both sides. In turn, the choice of topics was influenced

by the possible positive impact of content on the development of students¹⁸.

At each of the first 05 sessions, the subject was asked to read a predetermined book aloud for up to 15 minutes. The therapy dog remained lying on a rug and the children chose how to position themselves in relation to the dog when entering the room. The dog changed his position during the session, but without moving too far from the rug. Each session lasted no more than 20 minutes, covering the arrival in the room, reading the book, interaction with the dog after reading and leaving the room.

After the five reading sessions in the presence of the dog, each subject had a 6th session without the dog, which included children's books with different stories, some of which were related to dogs and had illustrations in the book cover with the animal. At the end, the students answered orally and individually to the questionnaire in order to collect data on the possible relationships between AAE and reading.

The responses of the subjects to the questionnaires before and after the AAE intervention were described (quantitatively) and linked to the complementary observations recorded by the researcher at each reading session and were then synthesized (qualitatively) in order to outline the individual profiles regarding the aspects relevant to the purpose of the study.

All videos were analyzed (total: 36 sessions) in order to establish subsequent content analysis categories, according to the incidence and relevance of the contents in relation to the research objective, based on the methodology proposed by Bardin¹⁹. The videos were analyzed in three stages: pre-analysis (visualization), selection of the relevant material and categorization of the selected material.

Results

There is an important issue to be raised before the presentation of the descriptive data. When the research project was first introduced to students, the vast majority wanted to participate due to the possibility of interacting with the dog. However, when students were informed that these activities involved reading aloud, there was a significant reduction in their interest. Many reported that they "had forgotten the ICF" or that they had not been authorized by their parents to participate in the research.

Responses to questionnaires before and after the AAE

Table 1. Results of the questionnaire applied before the AAI

Question	Yes	(%)	No	(%)
Do you have any pets at your home?	1	(16.6)	5	(83.3)
Do you interact with other pets?	5	(83.3)	1	(16.6)
Do you like reading?	6	(100.0)	0	(0.0)
Do you borrow books from the library only with the teacher?	2	(33.3)	4	(66.6)
Do you voluntarily borrow books from the library?	4	(66.6)	2	(33.3)
TOTAL	6	(100.0)	6	(100.0)

Table 2. Results of the questionnaire applied after the AAI

Question	Yes	(%)	No	(%)
Enjoyed participating in the study	6	(100.0)	0	(0.0)
Participant reads more often now	4	(66.6)	2	(33.3)
Participant reads with the same frequency	2	(33.3)	4	(66.6)
Participant noticed improvement in reading	6	(100.0)	0	(0.0)
TOTAL	6	(100.0)	6	(100.0)

Subjects' profiles (S1 to S6)

S1 – Female, 10 years old.

At first, she reported that she “liked to read, but not so much” and that she only borrowed books from the school library in the presence of the teacher. In the first two sessions, she avoided establishing physical and/or visual contact with the dog. However, from the 3rd session she created a bond with Lion and started to stroke him. She started the fourth session by reporting that she was afraid of dogs until she met Lion and that she overcame the fear from this interaction. She also repeated this report in the following session. At the end, she reported that she reads more frequently than before the AAI.

Book chosen in the 6th session: “How to Be a Good Dog” by Gail Page, published by Brinque Book (2006), with an illustration of a dog on the book cover.

S2 – Male, 11 years old.

He stated that he likes to read and that he reads frequently, in addition to borrowing books from the library even without the presence of the teacher. He had an immediate bond with the dog and began to stroke him frequently, developing a loving relationship over time. In the 1st session, he showed discomfort when reading aloud and

took many breaks to breathe while reading. These interruptions were reduced in the second session and became virtually non-existent from the 3rd session onwards. At the end of the IAA, the student reported that he improved reading, as he liked to read with the dog and also because “he is no longer stuttering”. He kept the same reading frequency.

Book chosen in the 6th session: “Madeline Finn and the Library Dog” by Lisa Papp, published by Editora Salamandra (2016), with an illustration of a dog on the book cover.

S3 – Male, 11 years old.

He reported that he likes to read and voluntarily borrows books from the library. He was attached to the dog from the beginning, but focused on physical contact at the beginning and end of each session and rarely stroked him while reading. He also reported that he enjoyed participating and that he reads better after the IAA. He also added that reading is good, but “it is even better with a dog”. He kept the same reading frequency.

Book chosen in the 6th session: “How to Be a Good Dog”, with an illustration of a dog on the book cover.

S4 – Female, 10 years old.

She reported that she “liked to read, but not so much” and that she only borrowed books from the school library in the presence of the teacher. When asked to read to the dog in the 1st session, she almost gave up participating and reported that she did not like to read aloud. Her decoding level was little fluent when she started the session; with low vocal intensity. During the sessions, her vocal intensity increased, but the low decoding level persisted. She was attached to the dog from the beginning and stroked him frequently. At the end of the AAI, she reported that she started to borrow books outside of school, in a project that she attends from the municipal government. She believes that she “learned to read a little more”, as she “feels protected” by the dog and “more comfortable” in his presence.

Book chosen in the 6th session: “Madeline Finn and the Library Dog”, with an illustration of a dog on the book cover.

S5 – Female, 10 years old.

At first, she reported that she “liked to read, but she voluntarily borrows books from the library. She was attached to the dog from the 1st session and stroked him frequently, even while reading. At the end of the AAI, she reported that she enjoyed participating and that reading with the dog “calms her down”. She also reported that her reading has improved and that she is reading more often.

Book chosen in the 6th session: “Butterfly ears” by Luisa Aguilar, published by Editora Callis (2007), with an illustration of a girl on the book cover.

S6 – Female, 10 years old.

She reported that she likes to read and voluntarily borrows books from the library. She gave the dog little affection in the 1st session, but she started to make body contact constantly from the second session. She reported that she enjoyed participating and that she reads more often. She also reported that she can read better with the dog and that she feels “happier” with him.

Book chosen in the 6th session: “How to Be a Good Dog”, with an illustration of a dog on the book cover.

The reports showed that reading skills improved after the sessions according to the self-

perception of all subjects. Most of them (4 of the 6 participants) started to read more often. In addition, the dog was perceived as an element that positively impacts the reading environment and/or the act of reading, making it more pleasant. Five of the 6 subjects chose books with illustrations of dogs on the book cover in the 6th reading session, which does not include the dog.

Content analysis categories

All reading sessions were analyzed to in order to define the categories; that is, 5 sessions with and 1 (the last one) without the dog; considering the use of verbal and non-verbal communication (gestures and emotional manifestations).

Self-reports:

The dog was frequently reported as the topic of self-reports, in narratives of everyday facts in the interaction with friends and family, namely: “My grandmother used to put ice in the dog bowl for her puppy in the summer”; “My neighbor has a dog” or “my uncle has a dog that looks like Lion”.

Example:

Very reserved child in the first sessions, who avoided touching and looking at the dog. In the third session, the child changed this behavior and began to pet the dog timidly, allowing him to lay his head on her lap. At the beginning of the fourth session, she started to pet the dog and reported: - “I was afraid of dogs until I met Lion and now I’m not anymore.” She returned to the subject at the end of the 5th session, when she reported again that she was afraid of dogs and overcame that fear (S1, 4th session)

However, it was also chosen to highlight the reports that do not mention the dog in the interaction with the participant.

Example:

When asked about the story after finishing reading the book “Madeline Finn and the Library Dog”, which tells the story of a girl who did not like to read aloud at school until she met a dog called Bonnie, she replied making a parallel between the book and her school experience: “It’s almost like my own life. We feel ashamed in the classroom. When people are reading in the classroom, we look at friends and they are laughing and they are

talking behind our backs. And we feel better here with the dog". (S4, 6th session)

Interaction with the book:

It was noticed that when readers were involved with reading, they established a relationship with the book by interacting with and approaching the text.

Examples:

When reading "Bone Button Borscht" by Aubrey Davis, published by Brinque Book (2006), which tells a story of a classic Jewish tale of how a beggar changes a poor village where no one helps each other and he proposes to make a soup with the buttons of his own coat, the child asked the meaning of the words "synagogue" and "to ponder" that are included in the text. Before finishing the book and anticipating the end of the story, he reflected and then said: "I think the beggar deceived the city, otherwise nobody would provide the food". (S2, 3rd session)

Reading session of the book "The Empty Pot" by Demi, published by Editora Martins Fontes (2007) that tells the story of the process of choosing a successor for a Chinese emperor. This tale discusses the honesty rewarded and, when the reading was finished, the child talked about the book and speculated on the possibility of another ending to the story. (S3, 2nd session)

When she saw the cover of the book "The Old Woman Who Named Things" by Cynthia Rylant, published by Brinque Book (1996), she smiled and said that she has already read this book and that the book is "very cool". Asked if she would like to read the book again, she continued looking at the book cover, smiled again and said: "Yes! I really like it (the book)!" (S6, 1st session)

Body contact with the dog:

All subjects, but S1, petted the dog in all sessions in which he was present. S1 avoided contact in the first two sessions, but started to pet the dog from the third session onwards.

In general, children stroked the dog before and after reading the book and even during reading. Three subjects (1,4 and 6) also had a body contact with the researcher, by saying goodbye with a kiss on the cheek at the end of some sessions.

Examples:

For the first time, she petted the dog immediately upon arriving in the room. She sat next to the dog to read and, while reading, Lion laid his head on her lap and she started to pet him, without interrupting the reading. She continued petting the dog while talking about the story read and maintained physical contact until the end of the session. (S1, 3rd session)

Body affection/closeness has been present in the interaction since the first session. However, when starting the fourth session, he lay down on the dog's belly, using it "as a pillow" during the reading. He remained in this position until almost half the session and after sitting down, he continued petting the dog until the end of the interaction. (S2, 4rd session)

Verbal communication to the dog:

S5 was the only participant who did not address the dog verbally (taking him as an interlocutor) during the sessions, despite talking about him with the researcher.

Examples:

After finishing reading the book, he continued talking animatedly with the researcher, about the dog, about himself and, in the middle of this conversation, he lay down beside the dog, looked directly at the dog and said: "I want to be like you, Lion, because I like to read and lie down." He continued talking and, before getting up to leave, he said goodbye to the dog. (S2, 4rd session)

Upon being introduced in the first contact and being told that the dog was called Lion, he explained the meaning of the English word "lion" in Portuguese. A little shy, he smiled at the dog and said: "Hi, Lion". He read the proposed story and, at the end of the session, he was looking more relaxed and said goodbye to the dog. (S3, 1st session)

He sat next to the dog and continued to pet Lion after reading the story. She spent a few minutes enjoying the dog's company and at the end of the session she said goodbye to the dog looking at him. Again, when she was getting up to leave, she leaned against the dog and said: "Hey, Lion! Bye boy!" (S4, 5th session)

She arrived for the reading session smiling, greeted the researcher and then said to the dog: "Hi, how are you?" She read the proposed book, petted the dog, enjoying his company and when the session ended, she said goodbye saying: "By, Lion!" (S6, 5th session)

Discussion

The low number of subjects who agreed to participate in the data collection of this study shows that reading is a critical point in the classroom. As previously stated, the study was presented to the entire classroom of the 5th grade and most students initially showed interest, but they gave up as soon as they were informed that it involved reading aloud in the sessions. This scenario is in line with the results obtained in the PISA in terms of reading, showing that almost half of the students do not achieve the expected performance in this aspect²⁰.

Given that the school experiences of the students and the way they perceive these interactions are critical to their active involvement in the learning process²¹, the refusal to participate in reading sessions indicates the relationship of students with reading activities and also may show weaknesses in the learning process and consequent suffering for students, as they chose to avoid it when possible.

Therefore, the small sample of this study consisted of students who, in the great majority, are interested at some level in reading, but it is not intended to be representative of all classrooms of the 5th grades of all municipal schools. On the one hand, from an academic point of view, this attitude of moving away from reading is negative; but, on the other hand, from the perspective of the development of AAE, it is possible to better understand the influence of the dog's presence in this context.

The participants' reports about the experience of reading with a therapy dog were positive, which is in line with Kaymen²¹ who reported that students are more relaxed and find reading more pleasant when in the presence of the dog.

Although participant 1 reported being afraid of dogs, she participated in all the sessions and, at the end, she mentioned that she really enjoyed reading with the dog. The psychic approach to phobias postulates that providing a positive model is one of the most powerful ways to reshape a fearful behavioral response^{23,24}. This positive model is ensured by the appropriate choice of the therapy dog, which enabled the assertive reconstruction of the interaction with this animal in this study. The therapy dog must undergo a temperament assessment specifically designed for the conditions found in Animal-Assisted Interventions (AAIs)¹⁷.

Facing fear when performing a school activity may impact the self-perception, as the feelings

experienced by the subject act as a filter for interpreting their effectiveness¹³.

Self-efficacy involves the idea that individuals are built on their ability to organize themselves to carry out actions to control events and demands in the environment²³. Some studies are focused on the role of influencing self-efficacy on learning, motivation and academic achievement²⁴.

In this study, the participants assessed their own performance and involvement with reading and these self-assessments involve the sense of self-efficacy²², as shown in the report of S2, who at the end of the interventions perceived that "he was no longer stuttering". In fact, this self-perception is proven by the absence of breaks in fluency during reading from the 3rd session onwards.

The findings corroborate the idea that the presence of the dog impacts pedagogical aspects, as reported by Hall¹⁰ in a systematic review of 27 articles, in which the author explores the benefits of dog-assisted reading as an educational practice. In the study, the author points out that the presence of dogs beneficially changes the behavioral and emotional processes that are important aspects in creating a favorable learning environment.

Thus, it is noted that the dog contributes to a welcoming environment by accepting unconditionally and not judging the students' performance, and can positively influence the learning motivation⁸.

These considerations can be observed in the report of S4, who reports feeling more "comfortable" to read when in the presence of the dog, and reiterate that the behavior of the dogs, who "listen" (without judging and/or criticizing), being complacent and allowing that students read at their own pace, help to transform children's behavior in relation to reading⁸.

In addition to the aspects of subjectivity, studies on the physiological effects of the presence of an animal suggest that the interaction with a dog can significantly reduce blood pressure and heart rate while a child reads aloud, which indicates a reduced anxiety²⁵.

Although all subjects in this study reported improvements in their reading skills at the end of the 6 individual sessions of AAI proposed, Le Roux⁸ suggests the implementation of longer programs (over 10 weeks). Therefore, it would be the minimum period to notice significant changes in reading skills. This aspect should be noted in future research on the topic⁸.

The findings contribute to the assumption that AAIs favor students' motivation towards academic activities, not being restricted to reading activities. Therefore, investments are needed in research on the impact of this device on education.

Conclusion

The presence of the dog as a pedagogical resource promoted a pleasant environment and increased motivation and engagement with reading among the participating students. The findings suggest that Animal-Assisted Education may provide a beneficial impact on student performance by operating on self-perception regarding reading skills in a positive way.

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