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A THEMATIC ANALYSIS OF CANINE-ASSISTED

INTERVENTIONS IN EDUCATIONAL SETTINGS IN FINLAND

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Abstract

The aim of the present study was to support further research into canine-assisted interventions (CAIs) by providing *small theories* about the effectiveness of CAIs in various educational settings. The main research question of this paper was *How and Why CAIs produce change in learning, in the opinions of practitioners in the field?* This research question was addressed through a number of smaller research questions, linked to the elements of *a small theory*. In order to answer the research questions, an interview guide was developed based on previous research literature and an instrument applied in previous research. Data was collected through semi-structured interviews with practitioners in the field of CAI across different educational contexts and analyzed with the help of thematic analysis. As a result of the study, three small theories, explaining the effectiveness of CAIs, were developed. According to the small theories, CAIs have a possibility to serve the needs of struggling learners, aiming to improve reading and oral skills and provide them with a more positive learning environment. CAIs influence educational goals indirectly, through improving aspects of the learners' motivation, self-perception and self-regulation. Moreover, CAIs provide emotional social support and coping assistance. As a result, the clients' attitude towards learning situations improves, their mood and happiness levels rise, which is seen as a valuable outcome of CAIs across contexts. The practitioners do not directly measure the outcomes of CAIs, but use observation and feedback to evaluate their effectiveness. The small theories can be used in future research as a starting point for new investigations.

Keywords: human-animal interaction, animal-assisted intervention, canine-assisted intervention, thematic analysis, small theory approach, educational settings, animal-assisted education, canine-assisted education, animal-assisted learning

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List of Abbreviations

Abbreviation	Explanation
HAI	Human-Animal Interaction
HAB	Human-Animal Bond
AAI	Animal-Assisted Intervention
AAT	Animal-Assisted Therapy
AAA	Animal-Assisted Activities
AAE	Animal-Assisted Education
CAI	Canine-Assisted Intervention
CAT	Canine-Assisted Therapy
CAA	Canine-Assisted Activities
CAE	Canine-Assisted Education
DLPs	Dog-Assisted Reading or Literacy programs
Models o practice:	
CAdH	Client-animal-dual-role-handler
CAHP	Client-animal-handler-professional
CA(H)	Client-animal handler
FKC	Finnish Kennel Club
KKKT	Koirat kasvatus- ja kuntoutustyössä
R. E. A. D.	Reading Education Assistance Dogs

I. Introduction

1.1 Research objectives/questions

The presence of animals in educational settings and their inclusion into the educational process is a common practice all over the world. Gee and colleagues (2017) cite the following ways of including animals into education: "resident classroom animals, family pet visits, brief interactions with an animal accompanied by a volunteer or professional animal handler [...], and field trips to farms, zoos, aquariums, and animal theme parks" (p. 1). Many educators believe that inclusion of animals fosters a more positive learning environment and helps to teach responsibility and compassion (Uttley, 2013). Such use of animals derives from amore general idea that communication with animals is beneficial for humans (McCardle, 2011). Human-animal interaction research (HAI) focuses on how humans and animals affect each other in various settings. Specific application of animals for therapeutic, educational and recreational purposes, conducted with the help of an animal handler, is referred to as animal-assisted intervention (AAI). The term canine-assisted intervention (CAI) is used to describe and research the use of domestic dog for the aforementioned purposes.

Brelsford and colleagues (2017) indicate that on the international level growing interest in the field of HAI and AAI manifests in the increasing use of animals in the classroom and therapeutic settings, as well as the number of publications on the topic. However, as shown by several systematic reviews, overviews and literature reviews that appeared in the recent years (Bert et al., 2016; Brelsford et al., 2017; Coderre, 2018; Gee et al., 2017; Hall et al., 2016; Maujean, 2015), the research in the field lacks studies with robust research designs. As a result, there is little empirical evidence of the effectiveness of AAIs. One of the reasons for this is heterogeneous nature of AAIs, as they are used by a number of professionals from different backgrounds, in different settings, with different populations and employ different animals.

Addressing this problem, Kazdin (2017) argues that the single explanation of the effects of AAIs, which previous research has been striving for (p. 154), is hardly possible to achieve. Using an analogy of surgery, he writes:

> Ultimately, we probably would not want to ask the question, 'whether AAI is effective' any more than we might want to ask 'whether surgery [medication, psychotherapy] is effective.' The answers depend on specific types of intervention (what type of surgery) as applied to what problem?' (p. 154)

He continues by suggesting that the field of AAI, among other things, would contribute from conceptualizing the focus of each study separately, through what he describes as *small theory* approach (p. 157). *Small theory* approach suggests that prior to designing the study a researcher must consider such questions as:

- What is treated and in which populations?
- How and why the treatment will affect the problem?
- What are the parameters of the treatment? (Timing, space, mode of delivery)
- What reflects the change?

Answers to these questions can be found in previous research literature, derived from the accounts of practitioners in the field or from pilot studies (Leviton & Lipsey, 2007). In other words, in order to design a rigorous investigation in the field of AAI, a researcher must select a particular type of AAI and ground her work in preliminary research. This is the intention of this paper. The present researcher has a teaching background, a great fascination with and interest in dogs. Hence, the research interest of this paper is focused on CAIs in educational settings.

Several organizations in Finland provide canine-assisted services, such as visitations by reading dogs or care dogs (Finnish Kennel Club, 2020; Suomen Karva-Kaveryt, 2020). In addition, several

institutions provide in-service training in AAI for education, healthcare and social work professionals (The Finnish Association for Dog Assisted Intervention [KKKT], 2020; Sosped Koira, 2018). This training allows individuals to implement CAI in the fields of healthcare, education, psychology, physiotherapy, or social work. Numerous schools, libraries and health-care institutions already apply canine-assisted activities on permanent or flexible basis (Helmet, 2017; Fröman, 2017; Oulu library, 2020). Recently, the University of Jyvaskyla has started a research project aimed at promoting students' well-being through dog-assisted intervention (University of Jyvaskyla, 2020). Thus, overall interest for using CAIs in education in Finland is high and research into this field may be interesting and useful for its practitioners and benefactors, as well as policy makers, educational administrators and fellow researchers.

Following Kazdin's (2017) recommendation, at this point, the researcher will not attempt to establish whether CAIs are effective or not. Rather, she will assume they are, and explore the opinions of the practitioners in the field on *how* and *why* CAIs produce change in learning. **The aim of this study** is, therefore, to support further research in the field of CAI by providing *small theories* about the effectiveness of CAIs in various educational settings. *Small theories* will be derived based on the relevant research literature and opinions of the practitioners in the field of CAI in Finland. **The hypothesis** of this study is that professionals in the field of CAI will have small theories about how and why CAIs produce change in learning and these small theories will be similar in similar educational contexts. **The research question** this paper is striving to answer is: *How and why CAIs produce change in learning?* This question will be answered with the help of **sub-questions**, developed in accordance with Kazdin's (2017) small theory approach. **The objectives** of this research are:

❖ to develop an interview guide, targeted at answering the main research question through a series of sub-questions, in accordance with Kazdin's (2017) *small theory* approach and previous research literature;

❖ to conduct semi-structured interviews with practitioners in the filed of CAI, according to the developed interview guide;

❖ to develop a deductive code book, based on previous research literature and theoretical frameworks;

❖ to transcribe and analyze the collected data through deductive-inductive approach to thematic analysis (Braun & Clarke, 2006);

❖ to extract small theories from the data and visualize them to facilitate further use;

❖ to link the developed small theories to previous research findings.

Having established the aims and objectives of the present research, we further proceed to describe the structure of the present paper.

1.2 Structure of the thesis

This thesis is designed with a view of a reader, who is unacquainted with the field of human-animal interaction. It consists of 6 chapters and 5 appendices.

The *Literature review* chapter consists of two sections. The first section explores and defines such fundamental terms as human-animal interaction (HAI), human-animal bond (HAB) and animal-assisted intervention (AAI). General challenges of defining the field are addressed and reflected upon and some solutions are offered Moreover, the models of practice, through which AAIs can be delivered, are outlined. Canine-assisted interventions (CAIs) are in focus of the second section of the chapter. General types of CAIs and their application in educational settings are discussed here.

In addition, existing theoretical frameworks explaining the possible influence of CAIs on learning are explored. Finally, the investigative framework for the study is proposed.

In the **Data and methods** chapter is designed in accordance with Domains 2 and 3 of Consolidated Criteria for reporting Qualitative Research (COREQ): a 32-item checklist for interview and focus groups (Tong et al., 2007). The researcher first describes the general methodology of the study. Kazdin's (2017) *small theory* approach is unpacked in detail and the choice of qualitative methodology is explained. Detailed description of data collection and analysis, provided in this chapter, is aimed at contributing to the trustworthiness of the study. The recruitment process and confidentiality issues are clarified here. The choice of thematic analysis as the method of analysis is justified. The development of deductive-inductive code book and issues of intra- and inter-rater reliability are addressed. The member check procedure, aimed to test validity of the study, is described and its outcomes are reported.

The **Findings** chapter holistically describes the accounts of participants of the study. The themes, obtained through the process of thematic analysis, are grouped here in accordance with the elements of a *small theory* (Kazdin, 2017) and reported with the use of illustrative quotes. A summary of the findings and of resulting small theories is provided.

In the **Discussion** chapter the researcher unpacks the small theories summarized in the Findings section of this study in relation to the previous research. The *General discussion* section is dedicated to the relevance of the small theories to the current research in the field of CAI and broader fields of AAI and HAI. Furthermore, the section conceptualizes the field of CAI in educational settings in Finland in relation to the types of CAI used in combination with models of practice and education related-goals. The *Small theories* section first summarizes aspects of the small theories common for different contexts. The ambiguity of bond with the dog, necessity of physical contact with the dog and handler interaction is discussed. The general discussion is followed with a more detailed description of each of the small theories: the problem, the populations served, specific mechanisms and outcomes are discussed here in more detail.

In **Conclusion** the limitations of the study are discussed, the project is summarized and suggestions for further research are made. Domain 1 of Consolidated Criteria for reporting Qualitative Research (COREQ): a 32-item checklist for interview and focus groups (Tong et al., 2007) is used here to address the issues of possible researcher bias and provide reflexivity.

The appendices include the interview guide, the final version of the codebook, the final combination of sub-themes into themes and an example of the letters to the participants, used for the process of recruitment and member check.
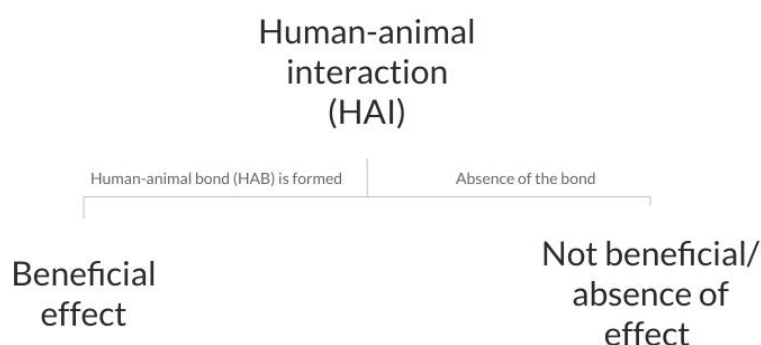
II. Literature review

1. Human-animal interaction: an overview

1.1 Human-animal interaction and human-animal bond

Human-animal interaction (HAI) is a term used to describe a broad range of relationships between humans and animals and the mutual benefits or drawbacks these relationships lead to (McCardle, 2011; Wilson & Barker, 2003). Modern research suggests that HAI *may* have positive effect on physiological and psychological health and well-being of both humans (Matchock, 2015; Kruger & Serpell, 2010; Richards et al., 2013) and animals (Gourkow et al., 2014). The keystone concept of HAI is **human-animal bond[1] (HAB)**.

The idea behind the HAB is that humans tend to form unique relationships (bonds) with animals, just as they do with other humans. If the bond is successfully formed, the beneficial effect of HAI is likely to manifest itself. If the bond, for any reason, cannot be formed, the interaction is unlikely to be of use[2]. HAB can, therefore, be considered a necessary prerequisite for any kind of HAI to have effect. Visually, the relationship between HAI and HAB can be represented as follows:

Figure 1
The Relationship between HAI and HAB

Human-animal interaction (HAI)

Human-animal bond (HAB) is formed | Absence of the bond

Beneficial effect

Not beneficial/ absence of effect

Though HAB is undoubtedly an important component of HAI, its unanimously accepted definition is currently nonexistent in research literature (Fine & Beck, 2010, p. 6). The most widely cited definition is that of the American Veterinary Medical Association (AVMA). According to AVMA, HAB is:

> ...a mutually beneficial and dynamic relationship between people and other animals that is influenced by behaviors that are essential to the health and well-being of both. This includes, but is not limited to, emotional, psychological, and physical interactions of people, other animals, and the environment. (JAVMA, 1998 as cited in Fine & Beck, 2010, p. 7)

In addition to the fact that HAB is beneficial for both humans and animals, some researchers agree that for the bond to form, the relationship between the human and the animal should be voluntary,

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[1] Sometimes spelled *human/animal bond*

[2] Hall, Gee and Mills (2016) make a similar conclusion in regard to dog-assisted reading interventions. They argue that if a child dislikes or fears the dog, i. e. if the bond between the dog and the child cannot be formed, the intervention is unlikely to improve the child's reading skills (p. 22).

reciprocal and continuous (Tannenbaum, 1995; Russow, 2002 as cited in Fine & Beck, 2010, p. 6). The last parameter, however, is achievable only in certain kinds of HAI, such as pet ownership. As the nature of HAB, its source is also debated in research literature.

The three main theories which had been used in research literature to explain the origins of HAB are biophilia, attachment theory and social support (Fine & Beck, 2010, pp. 8-10). The three theories are based on the idea that communication and social interaction within and between species have been necessary from the evolutionary point of view for the survival of the human race. However, each of the theories looks at this idea from a slightly different angle.

Biophilia, first defined by E. O. Wilson (1984) as "the innate tendency [of the human species] ... to focus on life and life-like processes" (p. 1)[3], is nowadays defined as an inborn and evolutionary beneficial predisposition of human species to relate to and interact with living nature (Fine & Mackintosh, 2016, p. 70). The concept of biophilia is rather broad and can be stretched towards anything that exists in nature. Some examples of 'living nature', cited in research literature, are: animals, landscapes, vegetation (Joye & De Block, 2011). Interestingly enough, the advocates of biophilia hypothesis disagree on what *kinds* of relationships and interactions constitute biophilia. For example, Wilson (1993) and Kellert (1993) consider a wide range of states, including those of aversion and fear to be explained by it (as cited in Joye & De Block, 2011, p. 192). Other researchers, in contrast, ascribe only affectionate states to biophilia, leaving the negative ones to the opposing phenomenon of *biophobia* (Ulrich, 1993 as cited in Joye & De Block, 2011, p. 192). Thus, though biophilia hypothesis is recognized as one of the possible explanations of HAB (Beck & Katcher, 2003; Fine & Mackintosh, 2016; O'Haire, 2010), it is also criticized in research literature (Joye & De Block, 2011; Joye, 2011). In comparison with biophilia hypothesis, the two remaining theories linked to HAB - attachment theory and social support - seem to be wider recognized by the scientific society.

Attachment theory is based on the idea of innate instinctive ability of humans and other species with 'extended period of dependence' (Rocket & Carr, 2014, p. 2) to develop *attachment systems* – behavioral mechanisms, which ensure survival of the young of the species. Attachment system regulates the relationships of infants with so called *attachment figures,* usually, their primary cargiver(s). Depending on the dynamics of such relationships *attachment styles* – relationship patterns – are formed (Rocket & Carr, 2014). Attachment bonds are different from other close bonds people form during their lives. Specifically, when such bonds are being formed in the childhood, attachment figures should function as *a secure base* (be seen as source of comfort) and *a safe haven* (be addressed to in times of extreme anxiety, sorrow, pain or other negative states). In addition, attachment relationships should be characterized by *proximity maintenance* (the child should enjoy the company of the caregiver) and *separation distress* (absence of the attachment figure should upset the child) (Kurdek, 2008 as cited in Rocket & Carr, 2014, p. 6). In adulthood, attachment bonds are defined by cognitive factors, such as "belief that the lines of communication are open, the perception that physical availability exists if need be, and trust that the attachment figure will be available if necessary" (Bolwby, 1979 as Rocket & Carr, 2014, p. 5). Moreover, adult attachment systems are characterized by hierarchical order. In other words, various attachment figures can fulfill various attachment functions in an adult attachment system. For example, "peers mainly provide proximity seeking and safe haven functions, and parents and partners provide separation distress and secure base functions" (Hazan & Zeifman, 1994 as cited in Meehan et al., 2017). Modern research demonstrates that animals can serve as attachment figures to humans (Rocket & Carr, 2014; Smolkovic et al., 2012, p. 16), sometimes fulfilling all four attachment

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[3] For a critical response to this definition, see: Joye & De Block, 2011, pp. 191-193

functions (Meehan et al., 2017, p. 285). In addition, humans can serve as attachment figures to animals (Udell & Brubaker, 2016).

Building on the idea of attachment theory (Serpell et al., 2017), social support theory argues that close relationships within a social network can prevent (buffering hypothesis) or alleviate (main effect hypothesis) symptoms of stress (McNicholas & Collis, 2006). Social support is defined as 'the perception or experience that one is loved and cared for by others, esteemed and valued, and part of a social network of mutual assistance and obligations' (Wills, 1991 as cited in Taylor, 2011, p. 129). Types of social support include: emotional support, esteem support, tangible/instrumental/practical support and information support (Cobb 1976 as cited in McNicholas & Collis, 2006, p. 51). For the social support to have effect the type of support and the stressor should match (Cutrona & Russell, 1990 as cited in McNicholas & Collis, 2006, p. 51, p. 53). An interesting fact about human social support is that it can be overly intrusive, can actually 'misfire' or increase rather than attenuate stress (Taylor, 2011, p. 198). Moreover, some people may choose not to seek human social support for a number of reasons (see McNicholas & Collis, 2006 for a account of breast cancer patients). Animals have been shown to be valuable sources of social support (Meehan et al., 2017; McNicholas & Collis, 2006).

The three theories discussed above can be difficult to separate as all of them describe different aspects of why humans evolutionary needed to be connected not only to other humans, but also to the nature around them. Fine and Mackintosh (2016) attempt to reconcile the three theories by using the metaphor of a three-legged stool. According to them, the element of familial love (or *Storge* as it is called in the article) should be included in the definition of HAB. The three theories, then, would lay a foundation to explain how *Storge* is formed (Fine & Mackintosh, 2016, pp. 69-70). However, it is not clear if the authors mean that the three theories *always* work together to explain the HAB or if in particular contexts HAB can be formed in the way suggested by *one* of the theories. The letter supposition allows arguing that if a person has a biophilic response (i. e. immediate affection) towards animals, an instinctive bond will form. If the immediate biophilic response is absent (the person treats the animals neutrally or even slightly dislikes them/is afraid of them), the bond can still be formed through the mechanisms of attachment or social support.

In light of everything which has been stated above, research into HAI can be described as a vast field of inquiry, seeking to understand the nature and the effects of human-animal relationships and interaction. HAB, in its turn, can be seen as the necessary starting point for the relationship to have effect.

Initially, the main focus of HAI research was on pets[4] (or companion animals) and their influence on certain aspects of human health (cardiovascular health, elderly people's health, child development) and well-being (social and therapeutic effects of pets). In addition, HAI research was interested in safety issues of human-animal interaction (McCune et al., 2014, p. 49; McCardle, 2011, p. 2). However, gradually, the field of HAI expanded and diversified to include research on human relationships with service and support animals[5], working animals, and various kinds of Animal-Assisted Interventions.

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[4] The word *pet* in this context is defined as 'any animal kept by human beings as a source of companionship and pleasure' (The Editors of Encyclopedia Britannica, 2017).
[5] For a discussion of the differences between service, work and assistance animals, see: Schoenfeld-Tacher, Hellyer, Cheung & Kogan (2017, pp.1-2) and Kruger & Serpell, (2010, p. 36)

1.2 Animal-Assisted Intervention

1.2.1 Models of Practice

Animal-Assisted Intervention[6] (AAI) is an umbrella term for several kinds of animal-assisted goal-directed services typically provided by a human-animal team to a client or clients. The teams usually consist of an animal handler, a trained animal or animals and/or a health/education/social work professional. Domestic animals typically involved in AAIs are horses, cats, birds, rodents, rabbits and fish (e. g. Bert et al., 2016; Brelsford et al., 2017). Some animal-assisted programs utilize wild species such as dolphins (e. g. Marino & Lilienfeld, 2007) [7] or even llamas (Chavez, 1997). To specifically mention the animal used in a given intervention, the first word 'animal' is typically replaced with the name of the species used, for example: canine/dog-assisted intervention, equine-assisted intervention, cat-assisted intervention, dolphin-assisted intervention etc.. However, if the animal used is a rodent, a fish or a bird, such interventions are usually referred to as animal- or pet-assisted interventions.

Typically, the animals participating in AAIs should be trained and certified. However, as Kruger and Serpell (2010) point out, certification programs and testing procedures are currently available only for certain species out of a wide variety of animals used in AAIs. This, in their opinion, should not undermine the value of programs using uncertified animals, as long as the intervention "intentionally includes or incorporates animals as part of a therapeutic or ameliorative process or milieu" (p. 36). During the intervention, the animal and the human have defined roles. The general roles of the members of a human-animal team are presented below (based on Fredrickson-MacNamara & Butler , 2010, pp. 127-130):

Table 1
General roles in a human-animal team

Member	Role	
Animal	– to **receive** the client: create a feeling of connection or *bond* between the client and the animal through eye-contact, touch and respect of personal boundaries.	
Human	**Professional**	**Handler**
	– to **plan** the intervention: choose an appropriate animal in accordance with the client's goals, the desirable outcomes of the intervention, the context and the environment in which the intervention occurs; – to **document** the progress and **adjust** the intervention so that the goals can be achieved.	– to **present** the animal: prepare the animal, ensure that its vaccinations and de-worming procedures are up-to-date, it is healthy and is willing to participate; – to **facilitate** the communication between the animal and the client; – to **act** as the animal's advocate to ensure the animal's well-being.
	'Dual-role handler' (Fredrickson-MacNamara & Butler 2010, p. 130)	
	- to combine the roles of the professional and the handler.	

[6] Sometimes is written 'animal assisted intervention' , without the hyphen
[7] They provide a critical review of dolphin-assisted therapy

The combination of the roles played by the human member of the team and the amount of interaction between the different participants of an intervention are described by the models of practice of AAIs.

As suggested by Brooks (2006) all AAIs can be described through two models of practice: the triangle and the diamond model (Brooks, 2006 as cited in Schlote, 2009). Visually, these models are represented by the present researcher in *figure 2*. To facilitate the discussions of the models, they will be referred to as the **CAdH** (client-animal-dual-role-handler, the triangle model) and the **CAHP** (client-animal-handler-professional, the diamond model).

As seen from the image, the **CAdH** model involves interaction between a client and a health/education/social work professional, acting in the role of a 'dual-role handler', who sets goals for the intervention, handles the animal and monitors the client-animal interaction at the same time. In this model, the animal usually belongs to the professional (Fredrickson-MacNamara & Butler 2010, p. 130). The interaction in this case is multilateral, implying that the professional, the client and the animal interact in order to achieve a common goal.

Figure 2
Triangle (CAdH) and Diamond (CAHP) Models of Practice
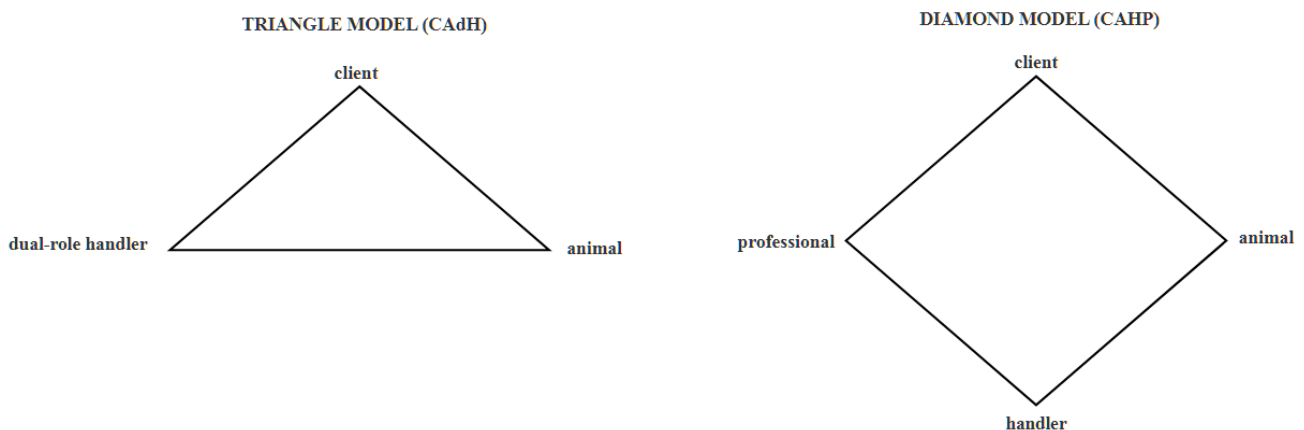
In addition to the classical CAdH model, the following model of practice exists (fig. 3):

Figure 3
Triangle Model CA(H)
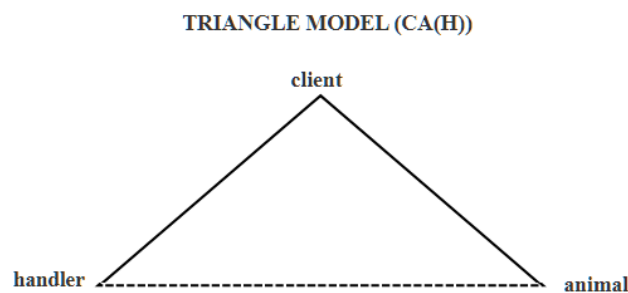
In this model, which will be referred to as **CA(H)** (client-animal-handler), the handler is a volunteer, whose primary goal is to ensure safety during the intervention. The main focus of such

interventions is the interaction between the animal and the client, the interaction with the handler is not implied or is rather limited. One example of such intervention is animal-assisted library-based reading programs, which will be discussed in more detail elsewhere in this paper.

The **CAHP** model, in its turn, implies participation of an animal handler, usually a volunteer, who might not be a professional in the field where AAI is used. In this case, the handler and the professional work in cooperation, fulfilling their respective tasks. According to Fredrickson-MacNamara and Butler (2010) this model is used when animals are big, or if direct contact with the animal is absent from the intervention (p. 130). Direct interaction between the professional and the animal is not implicitly provided in this model of practice. However, interaction between the handler and the client is possible, though its nature is mostly likely to be instrumental. For example, in equine-facilitated therapy, the handler might instruct the client on specific riding techniques (fig. 4).

Figure 4
Diamond Model (CAHP) with indicated possible communication between the handler and the client
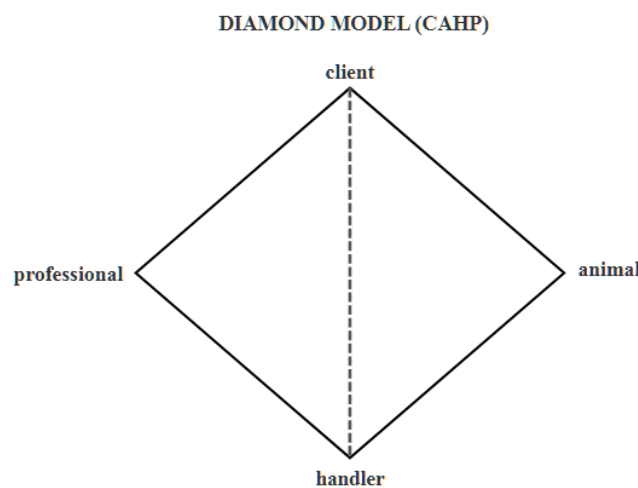
In combination, the models of practice and the goals of AAIs can help to define the three main types of AAIs.

1.2.2 Types of AAIs

According to their goals, all AAIs can be broadly divided into three types (Kruger &Serpell, 2010; Animal-assisted intervention international [AAII], 2020):

Table 2
Types of AAI

Goal	Model	Type of AAI
Therapeutic	**CAHP CAdH**	animal-assisted therapy (AAT)
Educational		animal-assisted education/pedagogy (AAE/AAP)
General well-being	**CA(H)**	animal-assisted activities (AAA)

Animal-assisted activities (AAA) are the most unstructured type of intervention. These activities have the broadest spectrum of goals, are usually provided by volunteers of various backgrounds and

include a broad range of unregulated activities. According to Schlote (2009) the main example of AAA are formal and informal animal visitation programs (AVPs) (p. 4). Fine and Mackintosh (2016) add animal-assisted crisis response and AAAs for at-risk or delinquent youth (p. 69) to he range of AAAs.

Animal-assisted therapy (AAT) is the most structured type of intervention. AAT is usually conducted in health-care and long term care facilities and have specific goals per every session of handler-animal team visitation. These sessions should be accompanied by at least one health-care professional in addition to the animal-handler team or the animal-handler should play a dual role. The main benefactors of AAT are hospital patients, nursing home residents, children, adolescents and adults under psychological or physiological care. The goals include reducing symptoms of depression, lowering anxiety and pain or stabilizing blood pressure, heart and respiratory rates (Bert et al., 2016). Some examples of AAT include: animal-assisted counseling, social work, psycho- and physical therapy, speech, nursing and occupational therapies (Schlote, 2009, p. 4; Fine & Mackintosh, 2016, p. 69).

Animal-assisted education (AAE) is a term used to describe structured interventions with specific educational or education-related goals. They are usually conducted in educational settings, such as universities, schools or libraries. The main benefactors of such interventions are pre- and school children, adolescents and undergraduate students. The benefactors can, but not necessarily do, have educational, developmental or behavioral difficulties. Typically, animal-assisted education session in addition to the animal-handler team should include at least one education professional or the handler should play a dual role. The goals of such interventions most often include improving reading skills (e. g. Hall et al.,, 2016) and reducing exam anxiety (Bell, 2013; Muckle & Lasikiewicz, 2017; Ward-Griffin et al., 2018). Examples of AAE include humane education and animal-assisted reading programs (Schlote, 2009, p. 4; Fine & Mackintosh, 2016, p. 69). Schlote (2009) also includes prison-based/juvenile detention centre programs into this category, while Fine and Mackintosh (2016) consider that such programs belong to AAAs. In addition, according to AAII (2020) the process of AAT and AAE should be documented and evaluated.

Therefore, the goal of the intervention, its model of practice, the amount of structure present in it and the fact of documenting and evaluating the process are the primary factors which help define the type of AAI. The context is a secondary factor as it can vary significantly and can confuse the classification rather than clarify it. For example, using AAT in educational settings with a special education student with a goal of improving the child's peer relations (Granger & Kogan, 2006) can lead to changes in their academic achievement. If the intervention in this case should be considered to be AAT or AAE can be defined with the help of these factors.

Kirnan, Ventresco and Gardner (2018) identify the difficulty of defining interventions as AAA/E/T, too. They propose to see the variety of AAI's as a continuum, where AAA and AAT fall at the beginning and the end of the line accordingly, while AAE falls between these two points, depending on the nature of the intervention (Kirnan, Ventresco & Gardner, 2018, p. 104). It appears that such fluid understanding of AAIs can help researchers and practitioners in the field to clearer communicate the traits of a given AAI program to the broader audience, such as clients or academic community.

The most wide-spread kind of AAIs in educational settings is canine- or dog-assisted intervention (CAI) (Brelsford et al., 2017). Before proceeding to investigate the main types of canine-assisted interventions in education, another issue should be briefly discussed, that is: Where should AAIs be placed within HAI research?

1.3.2 HAI or AAI?

HAI research ranges from investigating the effect of companion animals on child development to that of highly-structured animal-assisted therapy programs. Given this broad spectrum and multidisciplinary of the field, the terms HAI and AAI can easily be used in a way which can confuse readers. One example of such use can be found in the article "Human–Animal Interaction Research in School Settings: Current Knowledge and Future Directions" (Gee et al., 2017). In the following paragraph the abbreviations HAI and AAI seem to be used synonymously:

> We have found evidence of Kazdin's (2017) small theory approach in HAI research. That is, various researchers have been studying AAI within specific existing theoretical frameworks, building their own small theories for HAI effects. (Gee at al., 2017, p. 2)

In the consequent paragraphs, though, AAI is sometimes used as a particular example of HAI:

> ...HAI, and in particular, targeted AAIs, affect aspects of children's social, emotional, and cognitive development... (Gee at al., 2017, p. 2)

Or as a separate field of research:

> We do this first in studies in which HAIs or AAIs directly affect children's social and emotional development, then in studies in which HAIs/AAIs directly affect motivation, attention, engagement, and self-efficacy with additional indirect effects on learning. (Gee at al., 2017, p. 2)

Without doubt the authors of the article are aware of the differences between HAI and AAI, yet, their use of the two terms is somewhat confusing. This seems to arise from the fact that HAI can be seen as both the field of research, within which AAIs are placed, and one of the principal components of AAI. To clarify this confusion, let us look at the word *interaction* more closely.

According to the Oxford English Dictionary the word *interaction* is defined, on the one hand, as 'the act of communicating with somebody, especially while you work, play or spend time with them' (Oxford Learner's Dictionaries, n. d.). On the other hand, the word also means 'the effect that two things have on each other' (Oxford Learner's Dictionaries, n. d.). It seems that the two definitions are in line with the main interest of HAI research: various relationships between humans and animals and the mutual effect these relationships have. However, there are a certain fundamental differences between interactions and relationships. According to McNicholas & Collis (2006) interactions happen in the 'here and now', they are observable and serve as building blocks of a relationship. Relationships, on the contrary, are longitudinal and cannot be observed directly, but rather through a number of interactions or an oral account of one or both participants of the intervention. Relationship with an animal includes constructing an identity of the animal, assigning the animal a certain role and changing one's own identity to include this role (p. 57). Returning to the examples of HAI research, it seems that research into companion animals and pet ownership aligns closer to the relationship paradigm, while animal-assisted interventions align closer to the interaction paradigm.

The models of practice allow further separation of AAIs from other types of HAIs. For example, an interaction between a service dog and its handler would be visually represented through the following model (fig. 5):

Figure 5
Direct Interaction Model

service dog ⟵⟶ handler

This model, in comparison to those described in the previous chapter, implies direct communication between a person and the animal. Furthermore, the fact that it occurs naturally, without involvement of a third party, indicates that this interaction, though it can be beneficial for the handler (Kruger & Serpell, 2010, p. 36), cannot be considered an *intervention* - an 'action taken to improve or help a situation' (Oxford Learner's Dictionaries, n. d.).

Therefore, the field of HAI can be conceptualized in at least two dimensions: the duration of the interaction (immediate/longitudinal) and its nature (direct/mediated). This conceptualization is presented in *figure 6*. It allows more detailed description of the field of HAI and a more detailed placing of AAIs within it.

Figure 6
Conceptualization of HAI as a research field

	DIRECT		
IMMEDIATE (interaction)	- observing aquarium fish - bird-watching, etc	pet-ownership	**LONGITUDINAL (relationship)**
	short-term AAIs	longitudinal AAIs	
	MEDIATED		

Therefore, for the purposes of this paper, HAI will be seen as a broad field of research, investigating the nature and effects of various relationships and interactions between animals and humans. AAIs will be seen as a sub-field, placed within but not equal to HAI, focusing primarily on mediated and relationships and interactions between humans and animals and their effect. Canine-assisted interventions (CAIs), which we proceed to discuss in the next section, are seen as a variety of AAI.

2. Canine-assisted interventions

2.1 General information

Canine-assisted intervention (CAI) or **dog-assisted intervention** is a type of animal-assisted intervention, which uses domestic dogs in various environments with various populations for therapeutic, educational or other purposes. Dogs are the most popular animals to be used in therapeutic (Bert et al., 2016) and educational contexts (Brelsford et al., 2017). The popularity of dogs in CAIs can be explained by their friendliness and attentiveness towards humans, their ability to demonstrate affectionate behaviors (such as warm greetings) to the primary owner(s) and strangers, and their high trainability for a variety of tasks, including unusual ones, such as detecting seizures or low blood-sugar (Bert et al., 2016; Hart, 2006). As a type of AAI, CAIs can be broadly divided into three types:
- canine-assisted activities (CAA)
- canine-assisted therapy (CAT) and
- canine-assisted education (CAE).

CAA, CAT and CAE have similarities, which are found in the requirements for the qualifications of the two main participants of the interventions – the dogs and their handlers (AAII, 2019). The handlers are required to have 20 to 40 hours of training in dog handling and "at least 10 hours of continuing education every year in the topics of animal assisted intervention, dog training/handing, or dog behavior" (AAII, 2019, p. 13). The animals, in their turn, should undergo a training program and pass a test, designed to assess their emotional and behavioral suitability for work with clients. Apart from these similarities, CAIs differ in terms of goals, which are presented in the table below:

Table 3
Types of CAI

	CAA	**CAT**	**CAE[8]**
Goals	Improvement of aspects of human well-being: e. g. stress & anxiety reduction (Muckle & Lasikiewicz, 2017, p. 77; Ward-Griffin et al., 2018, p. 470), lowering reading anxiety and improving reading motivation (Kirnan, Ventresco & Gardner, 2018).	Improvement of aspects of human physical and mental health: e. g. reduction in Autism spectrum, depression symptoms, increasing cognitive function of patients with Alzheimer's disease (Nimer & Lundahl, 2007).	Improvement of cognitive and behavioral, emotional and social aspects of learning: e. g. improving reading ability, socio-emotional well-being, social skills, decreasing problem behaviors, promoting interpersonal skills etc. (Brelsford et al., 2017).

Despite the different goals the actual content of all the three types of CAIs can be quite similar and can include:
- 'touching, petting, looking at and talking' to the dogs (Ward-Griffin et al., 2018, p. 470);
- 'hugging, feeding, doing tricks, walking, grooming, playing fetch, and photo taking' (Muckle & Lasikiewicz, 2017, p. 77);
- studying dogs directly, using them as examples or creative prompts (Rud & Beck, 2000);
- reading to dogs (Hall et al., 2016) and
- training them (Connell et al., 2019).
Let us take dog grooming as an example of multi-faceted use of this activity in CAIs.
Dog grooming includes a number of activities directed at maintaining the dog's hygiene and/or exterior, demanded by the breed standard or the preference of the owner. Washing, brushing, cutting, and removing the hair, bathing, dental care and nail trimming are types of grooming activities.
Grooming can be used in:
− **CAA** as part of AVP in long-term residence facility: to provide pleasurable experiences for both the dog and the groomer (client).
− **CAT** during the course of rehabilitation, by a trained occupational therapist, to improve a client's fine motor skills.
− **CAE** during a biology lesson in school to teach students, for example, about the structure of animal fur and claws.

In educational context, dogs and the activities mentioned above are used to improve reading ability and associated skills, to reduce anxiety and stress, as enhancement to classroom environments to improve students' executive function, social skills, behaviour, learning engagement and the emotional background of the classroom in general (Brelsford et al., 2017; Gee et al., 2017; Barker, Barker, McCain & Schubert, 2016). Despite the varying goals of these interventions, their desirable outcomes seem to be educational, which would, according to the

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[8] Though, officially, CAE should include only educational or cognitive goals, practice shows that dogs in education are used to influence factors which are believed to have effect on learning.

reasons presented in section 1.2.2. of this review, formally place all of the interventions into the category of CAE. However, the actual use of the terms CAA, CAT and CAA is inconsistent in research literature, which parallels the situation in the general field of HAI. Though the writer of this paper is greatly interested in establishing clear differences between the three types of CAIs, it is beyond the scope of this paper. Moreover, efforts into this direction are being made by large international organizations, such as AAII (2020) and International organisation for human-animal research (IAHAIO) (IAHAIO, 2018). To facilitate the discussion, further we will refer to the use of dogs in education as simply canine-assisted intervention in education. We will, however, where possible, try to place certain CAIs on AAA/AAT continuum.

Growing interest in the effects of CAI in education has resulted in the appearance of a body of miscellaneous literature on the topic. One part of it consists of various reviews of literature on the topic. For example, systematic reviews of literature on dogs in the classroom (Brelsford et al., 2017) and children reading to dogs (Hall et al., 2016); overviews of literature on the effects of HAI in the classroom (Gee et al., 2017) and the effects of CAI on student stress (Coderre, 2018). Moreover, both new books and edited volumes, which include chapters on the effects of CAI in education, are being published (Fine, 2019; Gee, Fine & McCardle, 2017; McCardle, 2011). The two main ways to use dogs in education can be first briefly described as use of dogs to benefit children (persons up to 16 years old) and use of dogs to benefit adults (persons older than 16 years old). Further, we discuss both of these options.

2.2 Canine-assisted interventions in education

2.2.1 School dogs

School dogs are usually taken to school by teachers, to whom they belong. According to Beetz (2013) the main task of a school dog is being present in the classroom to ameliorate the classroom environment and influence students' motivation and discipline. In addition to being present, school dogs can sometimes do small tasks like rolling the dice to choose a task, delivering test results in an envelope or a basket or rewarding the students' performance by doing tricks for them. Moreover, dogs can assist students who need support by being near them. In additional to improving classroom environment, the teachers use school dogs to facilitate social interactions between their students, for example by improving students' social behavior or empathy, and to provide opportunities for safe and joyful interactions with dogs (Beetz, 2013).

Despite of this broad array of goals, little research has been done to confirm that dogs can actually help achieve these goals. The research which was done so far allows arguing that the presence of school dogs can reduce aggressive behaviors (Anderson & Olson, 2006; Hergovich et al., 2002; Tissen, Hergovich, Spielg, 2007), especially in boys (Kotrschal & Ortbauer, 2003), reduce stress and anxiety in response to a school task, especially in boys with insecure attachment patterns (Beetz et al., 2011, 2012ab as cited in Beetz, 2013) and promote positive emotions, associated with learning and positive attitude to school (Beetz, 2013). However, Beetz (2013) argues that in case of school dogs, the connection between the dog and the teacher is so strong, that it is impossible to separate the effect of the dog from the effect of the teacher. Therefore, it would be more correct to assign any effect school dogs have to the presence of a school dog-teacher-team, rather than the dog alone.

As the goals of using school dogs are indirectly related to learning, the context in which they are used is educational and they are mostly used by education professionals, it would be legitimate to

name such use of dogs CAE and place it closer to the AAT end of the AAA/AAT continuum (*fig. 7*).

2.2.2 Reading dogs

Another form of intervention used the most often with children under 16 years old is canine-assisted reading programs. This is evidenced by the existence of a whole systematic review of literature dedicated solely to the issue of children reading to dogs (Hall et al., 2016). Canine- or dog-assisted reading or literacy programs (DLPs) are one of the most popular and widely-known types of canine-assisted interventions. Over decades since the launch of the pioneering Reading Education Assistance Dog (R. E. A. D.) program in 1991, various similar programs around the world have been established. Some examples include: SitStayRead (the USA), the Bark and Read Foundation (the UK), Собаки для жизни (Dogs for Life, Russia), Lukukoira (Reading Dog, Finland). The mission of these programs can be summarized as improving "the literacy skills of children through the assistance of registered therapy teams as literacy mentors" or "reading companions" (Intermountain Therapy Animals, n. d.). Though the actual implementation of the programs varies from context to context (Lenihan et al., 2016), the actual idea of reading to dogs is quite straightforward: a child or children are given an opportunity to read to a friendly and calm animal, in the presence of an adult (the dog's handler), but without being interrupted or corrected. The philosophy behind such reading sessions is that the presence of and/or interaction with a friendly and non-judgmental animal increases reading motivation, reduces reading anxiety and helps children to increase self-esteem and self-confidence associated with reading.

As DLPs are targeted at indirectly improving reading skills, they can formally be considered a type of CAE. However, as they differ essentially in the amount of structure, Kirnan and colleagues (2018) propose, that different types of DLPs can be placed either closer to the AAA or the AAT end of the AAA/AAT continuum (*fig. 7*). Library-based DLPs align closer to the AAA end of the continuum as they are usually unstructured, provided through CA(H) model, are offered on a drop-in basis and have a broad spectrum of goals, which are not documented. School-based DLPs, however, align closer to AAT, as they are implemented on regular basis through either CAdH or CAPH model, serve specific populations, and have measurable goals. It is not rare, that such DLPs are an integrated part of a broader literacy program, implemented in a given school (Kirnan, Ventresco & Gardner, 2018, p. 105). Both types of DLPs are used in reading education (Beetz & McCardle 2017, p. 111) and both may have positive effect on various aspects of reading (Brelsford et al., 2017; Hall et al., 2016).

For example, the review of empirical research on animal-assisted interventions in the classroom, conducted by Brelsford and colleagues (2017), identified four relevant studies concerning dog-assisted reading education (pp. 15-17). Though all of the studies reported improvement in reading or reading-associated behaviors, the heterogeneity of study designs and populations, as well as some design flaws, made inferring any solid conclusions about the effect reading to dogs has on reading, impossible. On the other hand, the systematic review done by Hall, Gee and Mills (2016) focused exclusively on research into children reading to dogs and included all kinds of publications available, such as opinion papers, case studies, cohort studies, randomized control studies, etc. published in non-peer reviewed and peer-reviewed journals. Despite the general poor quality of the evidence base, the authors concluded that dogs may serve as an enhancement to traditional learning environments positively influencing children's mood and behaviour and their reading ability as a consequence (p. 13).

Later studies indicate important points as to what part of the CAI intervention produces change in reading and which populations can be best served by it. First of all, a recent experimental research done by Connell and colleagues (2019) suggests that reading ability may be equally well improved by structured reading interventions or by mere contact with a dog. In the study, children were assigned to three different conditions (Reading to a Dog, Training, Dog Present) for four weeks. Apart form the Reading to a Dog condition, where children participated in 8 15-20 minute-long reading-to-dog sessions, children in the other conditions did not do any additional reading activities during the program time. As indicated by the names of conditions, children in the Training group spent 8 15-20 minute sessions training the dogs, while the Dog Present group was engaged in usual classroom activities with the dog present. The time of interaction with the dog in Dog Present condition was restricted to control for the time parameter. The study did not implement a no-dog control group for ethical reasons. Upon the completion of the study, all children showed significant improvement on reading ability with no significant group or interaction effects. This result indicates a possibility that any kind of dog-human interaction may provide changes in reading. However, taking into consideration the absence of a control group, it is impossible to say whether the change in reading ability occurred naturally or could be assigned to the influence of the dog. The authors acknowledge this limitation and call for more research comparing reading-to-dogs programs with other types of human-dog interactions. The second finding of this research was that children with lower scores benefited the most from the program in all three conditions. This finding is supported by the wider research literature (Hall et al., 2016). Another group of children who could gain the most from using dogs in reading education are students with special education needs (Fung, 2017) and ELL-students (Kirnan, Ventresco & Gardner, 2018).

2.2.3 Campus dogs

In higher education, CAIs are mostly used to enhance students general mood, well-being and academic success by reducing symptoms of stress, anxiety and homesickness (Ward-Griffin et al., 2018; Coderre, 2018; Binfet & Passmore, 2016; Binfet, 2017; Silas, Binfet & Ford, 2019; Barker, Barker, McCain, Schubert, 2016, 2017; Bell, 2013; Haggerty & Mueller, 2017). In research literature, such CAIs are referred to as animal- or canine-assisted activities (Barker, Barker, Mccain & Schubert, 2017; Crossman, 2019; Jarolem & Patel, 2018), (visiting) therapy dog programs (Barker, Barker, Mccain & Schubert, 2016) or sessions (Ward-Griffin et al., 2018), canine therapy (Binfet, 2017), dog-assisted interventions (Grajfoner et al., 2017), animal-visitation programs (Crossman & Kazdin, 2015), pet therapy (Crump & Derting, 2015) and animal-assisted stress reduction programs (Haggerty & Mueller, 2017). Despite this abundance of names, the essence of most of the programs is to improve students' well-being through reduction of stress or stress-related issues. Therefore, for the purposes of this review, these CAIs will be further referred to under a general name of *canine-assisted stress reduction programs* and a single intervention of this kind will be referred to as *a session*.

According to a review done by Haggerty and Mueller (2017), in the context of the USA, most of canine-assisted stress reduction programs are held in the winter and spring semesters, just before the examination periods. Most often, the programs take place in the library or outdoors, though, in some cases, they can be implemented in a student's center or elsewhere. On average, 75 students participate in the sessions. The perception of the programs' effectiveness is overwhelmingly positive and in many cases outweighs the costs and the drawbacks the programs might cause (pp. 384-386).

Canine-assisted stress-reduction programs are usually organised on drop-in basis and involve communication between groups of students with one or several dog-handler teams (Ward-Griffin et

al., 2018). Another form such interventions can take are longitudinal programs, lasting several weeks and involving communication between a set group of students with assigned dog-handler teams (Binfet & Passmore, 2016). Both types of programs have been investigated in research literature with a prevalence of focus on short, single sessions, and have been argued to have positive effect on student well-being. In the recent years the research of canine-assisted stress reduction programs has seen an increase in methodologically rigorous studies, which are building upon each other. This makes providing a detailed and coherent review of studies into canine-assisted stress-reduction programs possible.

Barker and colleagues (2016, 2017) conducted a series of research projects aimed at investigating how a single canine-assisted stress reduction event would affect students' perceived and psychological stress one week before final exams. A preliminary project showed that a canine-assisted stress reduction program would be popular among college students and would lower perceived stress (Barker, Barker, Mccain, & Schubert, 2016, p. 37). Based on there preliminary results, a second study (Barker, Barker, Mccain, & Schubert, 2016) was conducted. Employing a cross-over randomized design, the study demonstrated that, in comparison to participation in attention-control condition, a single session of canine-assisted stress-reduction program reduced perceived stress, as measured by a stress visual analog scale (SVAS). However, the study failed to find any sign of physiological stress in students, as measured by salivary NGF. Though another physiological marker was obtained (sAA), there were no differences in changes of this hormone between two conditions. The researchers theorize that this finding can be connected to the time of research: one week before exam period physiological stress might not yet be fully expressed in biomarkers. The results could have been different if the intervention had taken place closer to the beginning of the actual exam period. Additional finding of this study indicated that the attention-control condition, during which the students completed the Family Life-Space Diagram (FLSD), did not lead to any changes in perceived stress, deeming this activity to be a viable control condition. The third study by the same research team (Barker, Barker, Mccain, & Schubert, 2017) used the information obtained through the FLSD to investigate if the participation in a canine-assisted stress-reduction session influenced students' perceived family support and their perception of current stressors. Through analyzing the FLSD data, the researchers were able to conclude that, first of all, the students felt equally emotionally close to their pets and closest family members. The closeness, however, were not affected by participation in the stress-reduction session. However, positive emotions induced by participation affected the students' perception of current stressors in their lives, making them seem easier to cope with.

Research by Binfet (2017) was informed by the study done by Barker and colleagues (2016) and built on an earlier research by Binfet and Passmore (2016). The 2016 investigation focused on an 8-week long canine-assisted stress reduction program and its effect on first-year university students' perceived homesickness. The focus of the 2017 study shifted to the effect of a single session of such program on students' perceived stress and homesickness. Both studies showed that canine-assisted stress reduction programs were effective in reducing students' homesickness (Binfet, 2017; Binfet and Passmore, 2016). The second study showed that a session as short as 20 minutes long has an immediate stress-reduction effect on stress as measured by Perceived Stress Scale (PSS-10) (Binfet, 2017). Though Binfet and colleagues found that after a two-week period the stress-reduction effect of the session disappeared, a similar recent study showed that the effects of a single session on stress were retained 10 hours after the intervention (Ward-Griffin et al., 2018).

On the one hand, the studies described above support several main ideas about the effectiveness of canine-assisted stress-reduction programs: the idea that the programs have the potential to reduce students' perceived stress, and that they are valuable tools at providing immediate stress relief for

students and could be especially useful at the times of acute stress, such as exam periods. On the other hand, all of them focused on group-implemented canine-assisted stress reduction programs, during which students could interact with both dog-handler teams and other students. Thus, though their findings confirm that a single short session of canine-assisted stress reduction programs is effective, it's difficult to make inferences if the stress reduction happened due to the interaction with the dogs or other factors. To address this limitation and ascertain that the positive results can be assigned to interaction with dogs, several studies were conducted.

To begin with, Crossman, Kazdin and Knudson (2015) investigated the influence of a single short interaction with a dog on medical students' and residents' anxiety and mood. The students were assigned into 3 conditions: experimental (interaction with a dog-handler team), no-interaction control (looking at pictures of dogs) and no-treatment control. The research found that a single (7-10 minutes) interaction with a dog reduces anxiety and negative affect, while increasing positive affect. Anxiety and positive affect are improved more efficiently by interaction with the dog in comparison to viewing pictures of the dog or no-treatment. Additionally, negative affect decreased both in dog interaction and no-interaction conditions, without a significant difference between conditions. The results were independent of the students' previous experience with dogs and expectations of the experiment. The findings of this study confirm that a brief interaction with a dog-handler team can reduce perceived stress as compared to such activities as taking a break or looking at pictures of animals. Another study, done by Grajfoner and colleagues (2017) took a more specific approach to the same question and investigated if communication with a dog, a hander or a dog-handler team will be the most effective at improving students' mood, well-being and anxiety. In their study students were placed into three conditions: "Dog only" "Handler only" and "Therapet session". The last condition implied communication between the participants, the trained handlers and their dogs. It is worth noting, that though the condition "Dog only" implied that the participants would communicated exclusively with the dogs, the handlers were still present in the condition, but were instructed to briefly introduce themselves and inform the participants that they will not answer any of their questions. The research showed that the improvements in students' mood, well-being and anxiety were significantly greater in 'Dog only' and 'Therapet' conditions. The changes in well-being and anxiety were equal in the conditions with the dog present, independent of the presence of the handler. The change in mood was numerically, though not significantly, greater in the 'Dog only' condition as compared to 'Therapet session' condition. The change in mood, well-being and anxiety in 'Handler only' group was slightly negative. The last finding seems to be particularly curious. Taking into account that all the participants assigned to "Handler Only" condition were informed that they will have a chance to communicate with the dogs after the experiment, it is unlikely that assignment to control condition influenced the participants' states. However, considering the fact that the handlers were instructed to discuss the same topics as if their dogs were present, the situation might have been unusual for the handlers and the participants as well, which could have influenced the findings. Overall, the study demonstrated that interaction with a dog, regardless of the interaction with a handler, can influence students' mood, anxiety and well-being.

All the studies discussed above had one parameter in common: their participants were self-subscribed females. This can be explained by the fact that females have been found to be more susceptible to stress and anxiety (Durand-Bush, McNeill, Harding, Dobransky, 2015, p. 254). Crump and Derting (2015) based a series of research projects on this finding (p. 576) and, thus, recruited only female participants for their research. They investigated the effect of a single canine-assisted stress reduction session on the students' perceived and physiological stress, measured by salivary cortisol, blood pressure and heart rate, as compared to such recreational or routine activities as playing cards, listening to music, reading, and texting. The results showed that a decrease in

perceived stress in both conditions, with a greater effect in the group, who communicated with dogs. On the other hand, no significant results were found for the physiological markers of stress. For example, the intervention failed to result in lowered blood pressure, which is inconsistent to the results of other studies which showed that interaction with dogs resulted in lowered blood pressure (Muckle & Lasikiewicz, 2017; Jarolem & Patel, 2018). Cortisol levels were within normal range for participants' sex, age and time of ay when cortisol levels were measured and no significant changes occurred during the intervention. This can be explained, as in the study done by Barker and colleagues (2016) by the timing of the intervention – two weeks before exam period physiological levels of stress might not be yet fully manifested in physiological markers. This consideration, however, was addressed in a research project by Jarolem and Patel (2018), who measured blood pressure of students during the final examination week on the day when the students had taken or were going to take an exam. In comparison with a control group, who were sitting in a quiet room for 15 minutes, the blood pressure of the students who could interact with dogs, was significantly lower.

Overall, the studies cited above conclude that brief canine-assisted interventions are a cost-effective and highly appealing way to reduce university and college students' immediate stress, elevate their mood and improve their well-being, which can be used as an alternative to traditional therapy. The latter is all the more important in light of the findings which show that students of different profiles rarely seek psychological help, even when under serious stress (medical students: Crossman, Kazdin & Knudson, 2015; students in general, Binfet, 2017; Crossman, 2019). Furthermore, though the studies report that canine-assisted stress reduction programs failed to influence physiological measure of stress in some cases, they confirm that perceived stress and anxiety are reduced by them effectively. Moreover, these studies demonstrate that the presence of the dog or interaction with the dog is possibly the main factor which influences the change in stress, as compared to other engaging activities such as filling in a family diagram (Barker et al., 2016) and other recreational or calming activities (Crump & Derting, 2015). Moreover, interaction with dogs has a more pronounced positive effect on human mood that just looking at pictures of dogs (Crossman, Kazdin, Knudson, 2015). In addition, the presence of and interaction with dog handlers has an ambiguous effect on the intervention results (Grajfoner et al., 2017).

   As canine-assisted stress reduction programs are usually implemented by volunteers, have a wide range of goals, they can be considered CAA and placed at the AAA and of the AAA/AAT continuum (*fig. 7*).

Figure 7 *CAIs on AAA/AAT continuum*
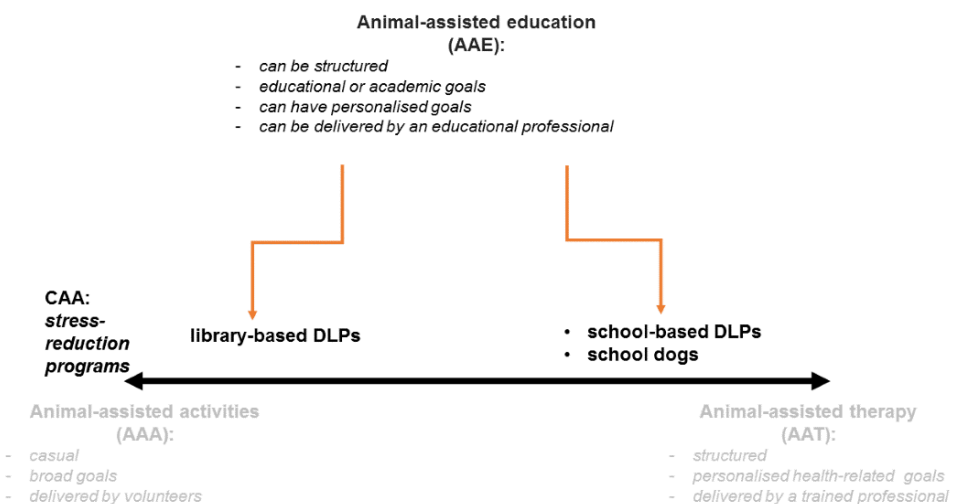
2.3 Theoretical frameworks

As it was shown above, CAIs are used extensively in educational settings to achieve goals directly or indirectly connected to education. In addition to answering the question *if* CAIs produce change in learning, current research struggles to answer the questions of *how* and *why* it does so as well. In the broader field of HAI and AAT, the theories of biophilia, social support and attachment have been traditionally investigated as the possible answer to these questions (Kruger & Serpell, 2010). However, gradually it became evident, that considering the vast variation within the field of HAI, it seems unlikely that one theory can explain all change in target behaviour. Therefore, nowadays each branch of HAI attempts to answer its own *how*s and *why*s, simultaneously drawing on the evidence from the wider field.

Several theoretical frameworks, explaining *how* and *why* dogs help achieve education-related goals, were proposed in relation to reading (***fig. 10, Hall et al., 2016***), stress reduction (***Table 4, Crossman & Kazdin, 2015***) and learning in general (***fig. 9, Gee et al., 2017***).

The most general theoretical framework was created by Gee and colleagues (2017). The framework depicts how HAI activities in general can influence learning directly and\or indirectly:

Figure 9
Framework depicting how HAI influences learning through various mechanisms
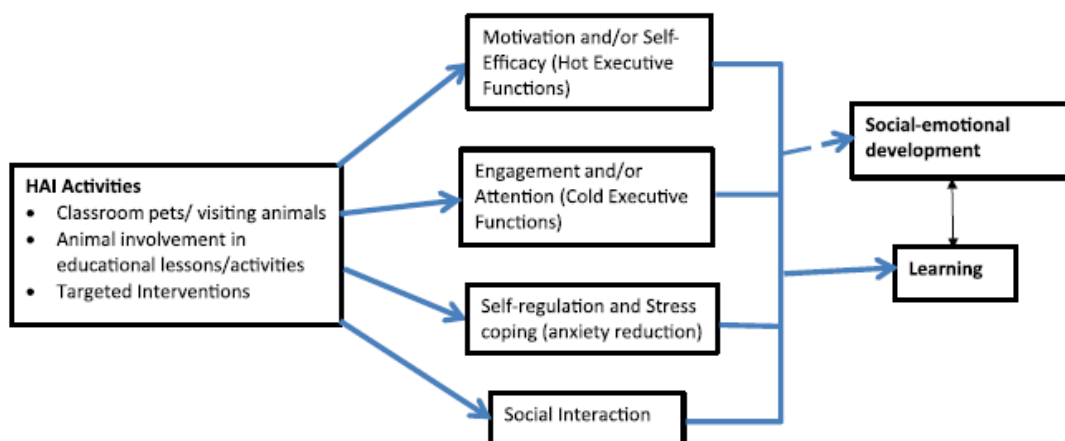
Note: Reprinted with no changes from: Gee, N. R., Griffin, J. A., & McCardle, P. (2017). Human–Animal Interaction Research in School Settings: Current Knowledge and Future Directions. AERA Open. DOI: 10.1177/2332858417724346 [9]

The researchers urge their colleagues to 'design studies to challenge or confirm this model' (p. 6). Though this framework is undoubtedly valuable as it includes four possible pathways of the effect HAIs have on learning and can facilitate research design in the field of CAI, it is also rather generic and lacks any detailed steps or links between interventions and their results. Based on the existing research literature on children reading to dogs and canine-assisted stress-reduction programs, this framework can be extended.

Hall and colleagues (2016) designed a theoretical framework, which demonstrates the possible indirect effect of reading to dogs on actual reading (*fig. 10*). Several important observations about this framework contribute to further development of the framework cited above. First of all, though the authors do not mention HAB explicitly in the framework, they do state that without the first prerequisite – the child liking the dog or feeling supported by it – the intervention is unlikely to have effect on reading. This is in strong parallel with the idea that HAB is a necessary prerequisite for CAIs to have a positive effect. Fine & Mackintosh (2016) propose that HAB can be explained through three theories, described in more detail in section 1.1 of this paper: biophilia, attachment theory and social support theory. Without doubt, the nature of HAB should be included into a theoretical framework, aiming to investigate the nature of the effect CAIs have on learning. However, attachment theory seems to be more applicable to longitudinal therapeutic interventions or pet ownership research, as forming attachment bonds requires a close, lasting and reciprocal relationship with the animal, which is often impossible in relatively short-term educational interventions.

Figure 10
An illustration of how Reading to a Dog may Influence Reading Performance
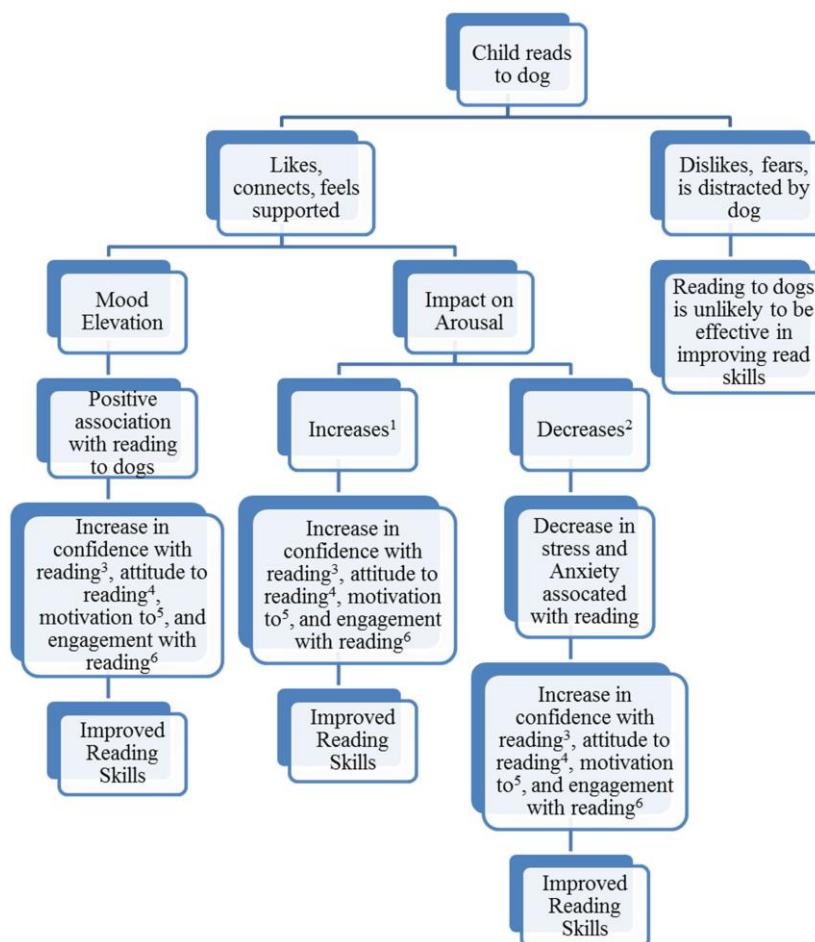
Note: Reprinted with no changes from Hall, S. S., Gee, N. R., & Mills, D. S. (2016). Children reading to dogs: A systematic review of the literature. PloS one, 11(2)[10]

Secondly, Hall and colleagues (2016) assume that the change in reading happens gradually. It starts by mood elevation or changes in the level of arousal, which in its turn, influences psychological factors such as self-confidence, motivation, attitude to reading, etc. Considering that an emerging body of research into canine stress-reduction programs confirms that a single brief interaction with a dog can promote positive emotions and reduce negative ones (e. g. Barker, Barker, Mccain & Schubert, 2017; Ward-Griffin et al, 2018), improve mood (Grajfoner et al., 2017) and change levels of arousal (Crump & Derting, 2015), this link can be an important contribution to the understanding of how and why CAIs produce change in learning.

Finally, Crossman and Kazdin (2015) present five 'plausible rationales' that could explain how CAIs may influence stress. The essence of the rationales is presented in the table below (p. 335):

Table 4
Rationales for the effect of CAIs on stress

The Rationale	The role of CAIs
Coping assistance	CAIs reduce stress through making stressors seem more manageable, and enhancing emotion regulation ability.
Opportunities for reinforcement	CAIs are pleasurable and rewarding, thus they promote positive emotions.
Emotional contagion	Dogs, involved in the CAIs, experience positive emotions which transmit to the participants.
Social facilitation	Participation in CAIs may encourage participants to enhance their social circles, therefore providing opportunities for enhanced social support.
Expectancy	The effect of CAIs is similar to that of placebo effect, they are only effective for the participants who expect them to be effective.

Though Crossman and Kazdin strived to explain the change CAIs produce in psychological state of the participants, the rationales, presented by them are similar to the pathways, leading to the change in learning, suggested by Gee and colleagues (2017). It seems, therefore, that CAIs have indirect effect on learning, produced through the change in psychological factors. Based on the three frameworks cited above and the review of wider literature the following investigative framework can be proposed (*fig. 11*):

Figure 11
Investigative framework of the possible indirect effect of CAIs on learning
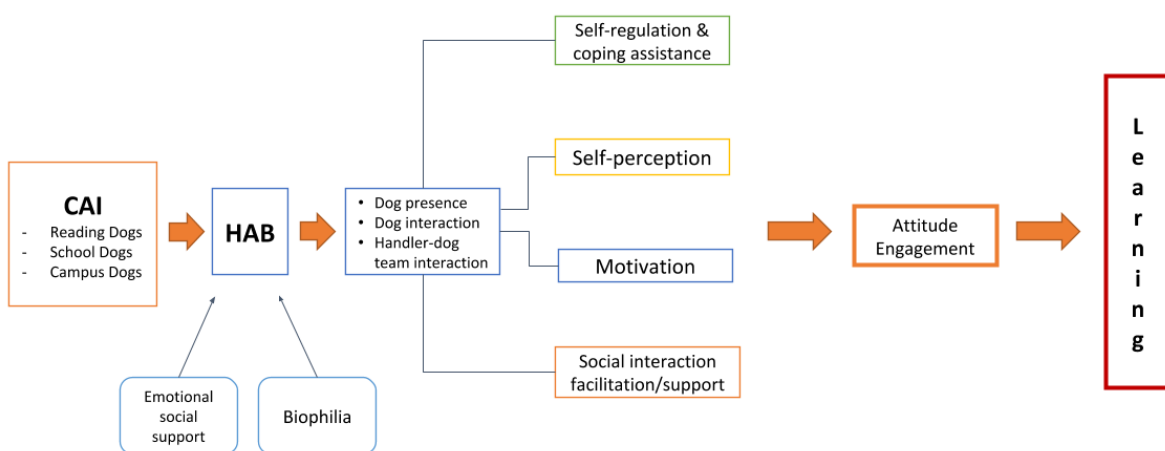
It should be noted that neither this framework nor the frameworks mentioned above are aimed at generalizing the effect of various CAIs. Rather, the framework consists of a number of 'small theories' (Kazdin, 2017) of how and why CAIs produce change in learning. Therefore, it includes numerous elements and can be connected, re-connected and re-thought in various different ways. Further research is needed to elaborate on the framework, support certain lines of investigation and discontinue others. As recommended by Kazdin, one way to build a 'small theory' about a phenomenon is to talk to the practitioners of the field where phenomenon is observed. Therefore, the next chapter of this thesis will be dedicated to answering the question of *how* and *why* CAIs produce change in learning, according to the practitioners in the field of CAI in Finland.

III. Data and methods

3.1 Methodology

The aim of the research in question is to inform further research in the field of canine-assisted interventions (CAI) by providing theoretical frameworks for implementing research on canine-assisted interventions in educational settings. The frameworks are designed based on 'small theory' approach proposed by Lipsey and Kazdin (Leviton & Lipsey, 2007; Kazdin, 2017). The hypothesis of this research is that professionals in the field of canine-assisted reading programs in Finland will have their own 'small theories' about how and why CAIs 'produce change' in learning (Kazdin, 2017, p. 156) and these theories will be common for professionals, practicing CAIs in similar settings. Further, **'small theory' approach** (Kazdin, 2017; Leviton & Lipsey, 2007) is explained in more detail.

A 'small theory' "attempts to describe the process through which an intervention is expected to have effects on a specified target population" (Leviton & Lipsey, 2007, p. 31). The use of 'small theory' (or *treatment theory*) approach to research design in the field of AAIs was first proposed by Kazdin (2017) as one of the strategies to improve evidence base of such interventions in the therapeutic context. In the therapeutic context, as in the educational context, the effectiveness of AAIs has not yet been proven scientifically. One of the reasons for this is the absence of a scientific base that would inform research design in the field. This can be explained by the miscellaneous nature of AAI, which has been discussed in detail in 1.2.2 of this paper. As it has been shown above, even in the case of a narrower branch of AAI – CAI, such interventions are used in a variety of contexts, with a variety of populations and by a variety of professionals. Building or finding a unified theoretical framework or scientific base for the interventions is difficult, if not impossible, in these circumstances. Using 'small theory' approach, according to Kazdin could remove this obstacle, as it does not aim to 'explain all therapy or all clinical problems' (Kazdin, 2017, p. 157).

The traditional elements for building a 'small theory' are provided by Lipsey (Leviton & Lipsey, 2007, p. 36) and Kazdin (2017, p. 157). With relation to CAIs they can be specified through the following research questions:

Table 5
Elements of small theory in relation to the research questions

Element	Description (Kazdin 2017, p. 157; Leviton & Lipsey, 2007, p. 36)	Research question(s)
Problem definition	What is treated? In which populations?	o What do CAIs in education aim to improve? For whom are they the most beneficial?
Critical inputs	How and why the treatment will affect the problem?	o What are the critical elements of the treatment? (e.g. mere presence of the dog; interaction with the dog or the amount of this interaction; the bond/relationship with the dog; responses/reaction of the dog to the participant; participant's relation to the dog) o What is the role of the handler? o What are the supposed mechanisms that bring about change?

Parameters of the treatment	Timing, space, mode of delivery	○ How many sessions are needed and of what length? ○ What kind of space should the sessions be held in? ○ Who else is participating in the CAI?
Outcome	What is seen as evidence?	○ After the intervention, what is seen as evidence and how is this assessed?

Lipsey (2017) recommends the following ways to build a 'small theory':

1). "make what use is possible of "off-the-shelf" theory from relevant disciplines" (p. 37)

2). "develop theory in separate studies prior to the evaluation of the treatment or program" (p.38)

3). "draw out the theory or theories implicit in any operational program or treatment from program personnel, relevant clinical practitioners, or recipients" (p. 38).

The present study draws on this recommendation. The literature review provides an overview of existing theories aimed to explain the effectiveness of CAIs. The research part provides 'small theories', extracted from semi-structured interviews with professionals in the field of CAI by means of thematic analysis.

The choice of qualitative methotodology for this research was informed by Lipsey's (2007) recommendation to elicit theories from the experiences of the practitioners in field of interest. Lipsey's recommendation, in its turn, is supported by Kazdin's (2017) idea that hands-on experience of professionals, working in the field of AAI can help 'develop and test theories and specific hypothesis about why and how AAIs produce change' (p. 156). Along with these considerations, several other observations were taken into account. First of all, research into the field of CAIs is marked with a paradox: on the one hand, a large part of the evidence of the effectiveness of CAIs in education comes from such qualitative data as participants' and practitioners' feedback and expert opinion (Hall et al., 2016). However, on the other hand, no systematic way is usually applied to the process of collecting and/or analyzing this qualitative data. Moreover, in some CAI studies with quantitative design qualitative data is collected, as it is considered to be an important source of knowledge, however, probably due to the lack of financial and/or time resources, is left without analysis (for example, LeRoux, Swartz and Swart, 2014). Therefore, though currently the field draws heavily on qualitative data, qualitative research per se is rarely utilized in the field (some examples are: Anderson & Olson, 2006; Noble & Holt, 2018), though it can undoubtedly contribute to its development.

3.2 Methods of data collection

Qualitative interview (Rapley, 2004), a version of *'engaged, active* or *collaborative'* (p. 25) interviewing which allows both the researcher and the interviewee to express their opinions in the interview process, was chosen as the method of data collection. To guide the interviewing process the guidelines, provided by Rapley, were used at all stages.

3.2.1 Sampling

During the recruitment process, the researcher followed "many trails, [...] relying initially on friends and colleagues and then on contacts given by other interviewees" (p. 17), as recommended by Rapley (2004). The recruitment process, therefore, can be shortly described as a 'snow ball' process. The first participant was contacted through a common acquaintance. During this interview several further references were obtained and in turn, these interviewees provided contacts of other practitioners who might be interested in participating in this research. Moreover, to widen the circle of participants, the researcher contacted CAI practitioners directly through Facebook groups dedicated to CAIs or emails published in open contact on the websites of organizations, whose

primary activities are connected to CAIs. The emails contained information about the research and its procedures and contact information of the researcher. An example of an email can be found in *Appendix A*.

In total, 25 people were contacted, 14 of them answered the emails and 11 of them agreed to participate in an interview. Data from 4 participants were excluded from the analysis, as 3 participants primarily practiced canine-assisted therapy, a branch of CAI unrelated to education, and 1 participant was primarily involved in training CAI professionals and her expertise did not fit the general profile of the participants. Though the interviews from these 4 participants were not transcribed or used for analysis, they were summarized and reflected upon to enhance the researcher's understanding of the topic, as "it is important to *try* and get a range of views on the topic of your research, as those few interviewees who produce 'radically different' or contrasting talk can often be central to modifying your theories" (Rapley, 2004, p. 17).

The final sample consisted of 7 female participants, with an average of 3.5 years of experience working with CAIs with a span from 1 to 8 years of experience. Most of the participants either worked as teachers during some period of their lives, were practicing teachers at different levels of education or had teaching qualifications. Only one participant did not have any kind of teaching background, though she worked in a library. Most of the participants of the study received the training, allowing them to practice CAIs in the Finnish Kennel Club (FKC). Two participants had R. E. A.D. training in addition to that received in the FKC. Two participants were trained solely by the Finnish Association for Dog-assisted intervention (Koirat kasvatus- ja kuntoutustyössä or KKKT). Demographic information, such as the participants' age, was not collected during the interviews as it seemed irrelevant to the purpose of the study.

Among the people, who declined to participate in the interview, the most common reason for refusing was insufficient knowledge of the English language. Conducting the interviews in Finnish or Swedish was impossible due to the respective insufficient knowledge of these languages by the researcher.

3.2.2 Interview guide

Initial questions were generated based on Kazdin's (2017) 'small theory' approach and a questionnaire, used by Schlote (2006) in an unpublished Doctoral thesis alongside with the researcher's intuitive ideas of what areas should be covered by the interview (Rapley, 2004, p. 17). The initial version of the interview was tested during a pilot and developed into its final version. The final version of the interview guide consisted of 5 primary questions and possible follow-up questions. The researcher also attempted to map the elements of a 'small theory', which would be most likely mentioned by the participants when discussing a certain question. The interview guide can be found in *Appendix B*.

3.2.3 Interview process

The interviews were conducted primarily through Skype for the comfort of the participants, though several interviews were conducted face-to-face in the places of choice of the participants: at school, in a participant's home and a cafe. No one else but the participant and the researcher were present during the interview process. The duration of one interview was between 30 minutes and 1 hour.

At the beginning of each interview, as recommended by Rapley (2004, p. 18) the researcher shortly described the research and its aims and objectives to the participants, clarified the issues of

confidentiality, re-asked the permission to record the interview and asked for the permission to use automatic voice recognition software for the transcription purposes.

As the field of CAI in Finland is relatively small and based on collaboration, being an objective outsider was not the researcher's intention. Therefore, the principles of *'engaged, active* or *collaborative'* interviewing were followed. This included:
– Initially introducing a topic for discussion.
– Listening to the answer and then producing follow-up questions.
– Listening to interviewees talk and asking them to unpack certain key terms.
– Listening to interviewees talk and [if it is needed] following it up with talk about your own personal experience or your personal opinion or ideas or the opinion or ideas of other people. • And whilst listening going 'mm', 'yeah', 'yeah, yeah' alongside nodding, laughing, joking, smiling, frowning (Rapley, 2004, p. 25).

In some cases, when the researcher thought that a topic has already been discussed in a previous question, she could choose to ask some of the follow-up questions directly, omitting the main interview question. Moreover, the order in which the questions were asked depended on the flow of the conversation rather than solely on the interview guide. Notes were taken during each of the interviews and reflections on them were made shortly after each of the interviews.

3.2.4 Data storage and confidentiality

The data is stored on the researcher's password-protected USB and will be deleted as soon as the process of data analysis is completed. To ensure confidentiality, each of the participants was assigned a code name (such as CAI_1). During the transcription process, the recordings of the interviews were downloaded into Otter voice recognition software with permission of the participants. All personal information was deleted from the transcripts or contracted (names of workplaces, places of living, personal names and names of pets). Each participant was assigned a code name. The recordings were deleted from the software as soon as the transcription process was completed.

3.3 Data analysis

Thematic analysis aims to find common patterns of thought about a certain phenomenon across a group of people (Braun & Clarke, 2006). As the aim of the present research is to find common patterns between the CAI professional's thoughts, thematic analysis was chosen as the method of data analysis. An additional reason to choosing this method of analysis was its greater, in comparison with other forms of qualitative analysis, accessibility of thematic analysis to beginner researchers (Braun & Clarke, 2006).

An 8-step inductive/deductive approach to thematic analysis (Fereday & Muir-Cochrane, 2006; Braun & Clarke, 2006; Nowell et al., 2017) was used. Each of the steps is described below in more detail. The steps were followed to ensure trustworthiness of the study and the principles of good practice. Importantly, though the process is presented as a linear 8-step procedure, in actuality the process was more complex, as thematic analysis is inherently "an iterative and reflective process that develops over time and involves a constant moving back and forward between phases" (Nowell et al., 2017, p. 4).

3.3.1 Inductive/deductive approach to thematic analysis

1.   **Familiarizing yourself with the data**

The data was transcribed using Otter voice recognition software with the participants' permission. The process of transcribing with the help of Otter software includes listening to the recording of the interview and making changes to the text, such as inserting punctuation marks and correcting the mistakes the software unavoidably makes. Thus, the data was read once already during the transcription process. After the interviews were transcribed, they were exported into word files, bearing the coded names of the participants. These transcriptions were read through once again, changes to any typos were made and reflective notes were taken.

2.   **Creating a theory-driven code-book**

A theory-driven (deductive) codebook was created. The thematic composition of the framework was developed in accordance with Kazdin's (2017) small theory approach. The codes, constituting each theme were based on the conceptual framework described in section 2.3 of this thesis and the literature review (Chapter II of this paper). The relation between codes and themes has been debated in research literature (Swain, 2018). A code, in this research, was seen as a constituent part of a multifaceted theme, as a unit of observation, describing a phenomenon from a certain angle. A theme, therefore, could consist of several codes or be coded directly as a theme (***see table 6 for an example of this distinction***). The themes and corresponding codes were discussed with the thesis supervisor and changes to the codebook were made (e.g. some codes were categorized differently or merged into each other). This resulted in a codebook that included 5 themes, consisting of 21 codes.

Table 6
Example of a theme coded separately and through several codes

Theme/Code	Definition	
Human-animal bond	HAB is the prerequisite necessary for CAI to have effect. Do the practitioners mention HAB? What is HAB in their opinion?	a theme coded directly
Population characteristics	Who are CAIs for?	
Age	Age range	
ESL student	Students, learning a second language (any language, not only English)	a theme coded through separate codes
Gender	Male or female	
Reluctant student	Students, who are not engaged in the learning process (distracted, doesn't like the subject)	
Special needs	Students, with special educational needs (ADHD, autism, physical and psychological traumas etc.)	

3.   **Creating a deductive/inductive code-book**

The transcribed data were read through once again. Reflective notes were expanded and later compared to the notes taken directly after each of the interviews. Based on these notes, inductive codes were created. Data was coded once with the help of NVivo software, according to the inductive-deductive codebook. Upon coding, the codes were reviewed and the final version of the code book was created. The resulting codebook consisted of 9 themes and 37 corresponding codes.

4.   **Testing intra-rater reliability**

The first interview was chosen to check intra-rater reliability due to its high saturation with themes. The researcher coded the first interview against the new codebook. Several days later the same interview was coded once again by the same researcher. To calculate intra-rater reliability, the old and the new codes were manually copied into two columns of an Excel file. Simple percentage agreement between the two coding attempts was then calculated. The number of agreed codes was divided by the total number of codes (Macalister & al., 2017) and the resulting agreement of 0,74 or 74 % was found. The result was lower than the generally recommended agreement of 85-90 %

(Castleberry & Nolen, 2018, p. 812), and therefore it was decided to review the disagreements to see if these indicated a need for changes in the codebook.

The biggest disagreements were found in the "Dog interaction", "Handler interaction" and "Output" themes. The first two themes were initially coded through two codes: "Active" and "Passive". However, several observations were made during the coding, which suggested that such coding was insufficient. First of all, interactions during CAIs include communication of at least three participants, each of whom is an autonomous being capable of initiating communication. This made a simple dichotomous distinction between 'active' and 'passive' difficult. Secondly, a CAI session consists of several parts and interaction patterns may differ between these parts. Therefore, it was decided to code everything, relating to interaction with dogs into "Dog interaction" theme and everything, relating to interaction with the handlers to "Handler interaction" theme, without distinguishing the patterns in the process of coding. The same was done for the "Output" theme. The resulting codebook consisted of 9 themes coded into 33 corresponding codes (**Appendix C**).

5. Analyzing the data and testing inter-rater reliability

The data were analyzed according to the final codebook, developed at the previous stage.
The researcher chose to calculate inter-rater reliability to test if the codebook could be consistently coded in the same way by an independent researcher. One of the interviews along with an Excel spreadsheet with the coding frame and its clarifications was sent to an independent Master's level researcher whose interest also lies in the field of CAI. The interview was chosen due to its high saturation with themes comparable to that of the one the original researcher used to check intra-rater reliability. A brief meeting was organised through Skype to explain the coding frame. The second coder copied relevant text excerpts into the Excel coding framework. The original researcher coded the interview in NVivo software, according to the Excel spreadsheet, to facilitate the calculation process. Upon coding Cohen's Kappa coefficient was calculated with the help of NVivo software. This measure was chosen in order to take into account possible agreement by chance. First result of $k = 0,53$ was obtained. This result is generally considered to be weak (McHugh, 2012). Through further discussion it was possible to increase agreement up to $k = 0,64$, a result which is considered to be moderate (McHugh, 2012). In addition, another round of intra-coder reliability was performed by the original researcher on one of the interviews. A strong coefficient of $k = 0,88$ (McHugh, 2012) was achieved and it was decided to proceed with the analysis.

6. Identifying overarching or clustered themes and producing the first report

Upon checking for inter-coder reliability, the data was summarized, in accordance with Bazeley's 'Describe-Compare-Relate' formula (2009, p. 10). After the data was summarized, some of the themes were clustered into overarching themes, in accordance with the logic of 'a small theory' (Kazdin, 2017) **(Appendix D)**. Five overarching themes were identified: "*Problem definition*", "*Critical inputs*", "*Parameters of the treatment*" and "*Output*". The first report of the findings was produced.

7. Checking validity of the findings

Validity in this study is understood as a measure of 'how accurately the account represents participants' realities of the social phenomena and is credible to them' (Schwandt, 1997 as cited in Creswell & Miller, 2000, p. 125). Therefore, validity refers to the interpretations of the data made by the researcher, rather than raw data. Creswell and Miller (2000) state that validity of a study can be established from several perspectives: through the lens of the researcher or researcher team, the

participants and the external readers or reviewers. They recommend several ways to establish validity from each of these perspectives (p. 125), several of which have been used in this study. The attempt to establish validity from the researcher perspective is represented in the current study by *researcher reflexivity* – a description of the researchers 'entering beliefs and biases' (p. 127), provided in the Researcher reflexivity section of this paper. Furthermore, the researcher hopes that the rigorous description of steps taken to conduct this study will serve as an *audit trail* to establish validity from the readers' and reviewers' perspectives (p. 128). The 'member check' (Creswell & Miller, 2000; Thomas, 2017) procedure was used to establish validity through the lens of the participants of the study. Though this procedure is generally used in qualitative research, its use is somewhat contradictory, as exact ways in which the procedure contributes to research are rarely described and participants' response rate is usually low (Thomas, 2017). Discussing the general appropriateness of the procedure, Thomas (2017) concludes that its use is justifiable when 'the main purpose of research is ensuring accurate representation of participants' perspectives or experiences' (p. 39). The aim of this research was to construct small theories based on the participants' accounts of their CAI experience and practice. Therefore, ensuring that their accounts are interpreted and understood correctly was a necessary step. In addition, many participants expressed interest in reading the final work at the interview stage, which gave the researcher hope that the response rate would be higher than usual. Another aim of the member check procedure was to ensure that all of the participants were comfortable with the researcher using quotations to illustrate the findings.

All participants of the research, whose interview were used for the final analysis, were sent an email, asking them to provide feedback to the findings. The participants were asked to answer two questions:
– In your opinion, do the findings represent your view of the reality of CAI in education in Finland?
– (*if you recognize yourself from the quotes*) Do you feel comfortable with me using these quotes to illustrate the findings? If not, how can I change them to ensure your comfort?
Furthermore, two options of giving feedback were described. One of them implied reading the whole findings section, the other – only the quotations, the summary of the findings and the table, summarizing the small theories. The two options were provided to increase participation, taking into account the participants' limited time. Additionally, a deadline of 10 days was set in order for the researcher to receive the feedback, make changes to the findings part, if needed, and proceed with the study. An example of the letter can be found in *Appendix E*.

All, but one participant sent their feedback to the researcher in the form of reply to the original email. All participants read the whole document. The length of the feedback varied from a page of printed text to several lines. All participants agreed that their views of how CAIs work in educational context were represented accurately in the first report of the findings. One participant made a valuable observation of how her opinion about one of the aspects of CAI was represented in a way which could give a wrong impression to the readers. This excerpt of text was re-written. All participants who recognized themselves from the quotes, agreed to their use in the final paper in the present form.

8. **Producing the final report** of the findings.

Upon receiving and reflecting on participant feedback, the researcher revised the findings in accordance to the relevant research literature. As a result, the final report of the findings was produced.

IV. Findings

4.1 Background information

Seven CAI practitioners took part in the research. CAIs were practiced by them in three different types of educational settings: libraries (3), universities (2) and schools (2). Within the library and university contexts CAIs were organised either on drop-in basis or were scheduled in collaboration with a teacher. In the school context the dogs were incorporated into the lessons with a teacher acting as a dual-role handler.

All of the participants came from different training backgrounds and expressed views on their training during the interviews. A summary of the different training schemes in relation to the number of participants is presented below:

Table 7
Training background of the participants

Training		Setting (number of participants)
Finnish Kennel Club (FKC)	only	University (2), library (1)
	+ R.E.A.D.	Library (2)
Koirat kasvatus- ja kuntoutustyössä (KKKT)		School (2)

One common trait for the whole narrative was that the participants trained in FKC (including R.E.A.D.) often talked differently about certain aspects of CAIs than participants, whose training came from KKKT. In relation to training, FKC participants emphasized the importance of the handler's involvement with the particular CAI they are doing and the need for the corresponding training. KKKT participants focused their descriptions on how the training contributed to their professional development as a teacher and on the idea that *'the dog should do more than just hang around'* (CAI_6).

4.2 Problem definition

This theme describes what CAIs in education aim to improve and in which populations. First of all, it is worth noting that the aims of different CAIs can be partially described already by looking at the participants' training background. A detailed summary of how different training schemes were represented among the participants is presented below:

Table 8
Representation of the different training schemes among participants

Training	Context	Library			University		School	
		CAI_1	CAI_2	CAI_5	CAI_3	CAI_4	CAI_6	CAI_7
R.E.A.D.		+	+					
FKC	lukukoira	+	+	+	+	+		
	kaverikoira				+			
KKKT							+	+

The R.E.A.D. training scheme has a goal of building and encouraging "children's love of books and the reading environment, and providing an opportunity for them to practice the full range of communication skills" (Klotz, 2009). The Finnish Kennel Club has two certification programs in place, namely *lukukoira* (reading dogs) and *kaverikoira* (care dogs). The dog-handler teams

working under the title of *Kaverikoira* visit elderly homes, hospitals and other care facilities. The *Lukukoira* teams work in libraries, where the dog is listening to readers, helping them to relax and reduce their anxiety (Finnish Kennel Club, n. d.). Therefore, on the level of training the aim of these CAIs is to support reading education through reducing reading anxiety and making reading a pleasurable activity and/or to support vulnerable populations in care facilities. Furthermore, currently, *lukukoira* and *kaverikoira* teams are working in the university settings to help maintain and improve academic well-being of the students. The Koirat kasvatus- ja kuntoutustyössä training is a professional development program for educational, social work and healthcare professionals aimed at training them to use dogs as a 'functional method' within their profession (KKKT, n. d.). Therefore, the goal of a given CAI would be defined by each professional within the field, depending on the needs of the clients. However, in addition to these self-obvious goals, the participants' motivations to practice CAIs and personal goals were discussed during the interviews.

4.2.1 Handlers' motivation to do CAIs and their personal goals

The goals were connected with the handlers' professional and personal backgrounds. First of all, all handlers who practiced CAI in libraries, regardless of their training (R. E. A. D. or FKC), shared the goal of encouraging children to read, by making the process of reading more interesting and pleasurable and bringing the world of books to the children. All of these participants had a shared love of books and reading, though only two of them were librarians. In addition, two of these participants stressed the importance of making reading interesting in the face of new distractions in the lives of children, i.e. digital games. For the two handlers, who received their training from FKC and worked in the university, doing volunteer work was the primary goal of practicing CAIs. However, when both of them were engaged in activities which involved participation of teachers, their focus shifted to helping the students achieve the goals, set by the teacher. The two participants trained in KKKT shared the goal of motivating their students to learn and influencing the learning environment in a positive way. Interestingly, no directly academic-related goals were mentioned in this context by any of the participants.

There was an interesting interplay between the handlers' goals and motivations to practice CAIs, which was manifested in several patterns, which the researcher labeled as *'the package'*, *'accidental'*, *'something nice/fun with the dogs'*. The labels are used in quotation marks, because they are expressions used by three participants in the study, which to my mind very well reflect the way many of the participants came to conduct CAIs.

'The package'

For the speakers in this group, the motivation to use their dogs came after the general goal of helping people. This pattern is characterized by *'This is it!'*-feeling (CAI_1) the participants expressed when talking about their search to achieve their goals and their first encounter with CAIs. Upon having learned about CAIs, the participants often immediately realised that they had 'a package' – a perfect dog and love of dogs, a willingness to help people and a relevant background. Sometimes, however, several years spanned between the first encounter of a participant with CAIs and her meeting the perfect dog.

The particular intention to and direction of help came from the professional or personal backgrounds of the participants. For example, those speakers who worked in the library, regardless of their consequent CAI training (R. E. A. D. or FKC), shared the initial goal of encouraging children to read, by making the process of reading more interesting and supportive. 'The package' for them was a perfect dog, love of dogs and reading and the goal to help with reading education. A 'perfect dog' in this context was described as clever (CAI_2) and willing to take contact to people

(CAI_1). Another example of this pattern would be CAI_3, whose initial goal was to do voluntary work and dogs came into the picture only later. In a touching and personal way, she describes the lengthy way she had to take before coming to the decision of doing CAIs:

> So I just met with a, an acquaintance walking the dog and she said that she's going to this assessment. And she wants to be a voluntary worker and with the dog and I got really excited because I have... I had an old grandma.. And I used to visit with her every day whenever I could. And then when she died, she was almost 103 when she died. And then I went back to that home for the old and I tried to talk with the old people, but I didn't have my grandma there anymore. So it wasn't really the same. And then I started looking for any other forms of voluntary work. So I went to this, it's called the... the grammar... the grandma something and they were all... all very old, the other volunteers, so I just thought that nah, it's not my thing. Then I moved to T., and then I went to give out food for the homeless people. But that wasn't... that was only sad, because I didn't... I only saw the misery of those people and I couldn't help them and I couldn't.... It's so quick. You just hand out the food and you don't really talk with the people. So then I was a bit lost with what I could do. And then when this person said that there is this voluntary activity with dogs and I love dogs, so I thought amd S. is the perfect dog for that job. So I thought that Why not?

'Accidental'

For the speakers in this group, the motivation to do CAIs came as a consequence of wanting to have a dog. Both speakers who were trained in K.K.K.T. scheme told that they were not intending to use dogs in education prior to getting a dog. This is how CAI_6 describes how her dog began working as her assistant:

> Yeah. So that started about six or seven years ago, when I got... I got a Labrador puppy. It was kind of kind of like accidental how the whole thing started. I had... there was a misunderstanding with the breeder, I thought that we had agreed that... that L. would come home right after school ended or the school year ended, but.... but then actually, I had to go pick him up like, two or three weeks before and I was kind of panicking because I was living alone, like, what am I going to do? I still have really long days and, you know, a puppy can't stay alone for eight hours, that's... that's too much to ask. So I was... I was kind of talking about that at work. And then... our then janitor said, you know: It's not really a big problem. I can help you out. You can bring him to work, he can stay in my office and, you know, I'll... I'll take him out when you're in classes and just make sure to talk to the principal first and see that he's okay with the idea. And our principal then, a big dog lover too, he was like, you know: Absolutely! of course, we'll help you out. So, so that's how L. came to work. And he kind of settled right in.

CAI_7 confirms that her involvement with CAIs happened as a result of a colleague, already practicing CAIs, recommending her to enroll her dog in the course.

'Something nice with the dogs'

Two participants, however, fall in the 'grey zone' between the two patterns: their primary motivation was to do voluntary work or something else with the dog and CAIs fit their purpose.
  Another part of the problem definition is the characteristics of the population which can benefit the most from the CAI, which we discuss in the next section.

4.2.2 Population characteristics

Age

A wide range of ages was mentioned by the participants. This, however, can be explained by the nature of the sample – the researcher talked to practitioners, who work in the libraries and usually host primary-school age children; in schools and, therefore, work with teenagers; in universities and

help students. In addition, one practitioner in the library context mentioned that CAIs can be beneficial for adults who have had injuries, preventing them from reading easily.

Type of student

Most of the participants across different CAI backgrounds expressed the belief that CAIs were the most beneficial for struggling students. In the context of school-based and library-based CAIs, such students were described as '*left behind*' (CAI_7) from the class, because of sickness, shyness, or other problems. In the university context, such learners were described as *'people that are very anxious, afraid to talk to other people or give presentations'* (CAI_2) and their primary difficulty was connected to oral skills, such as talking in a foreign language or giving presentations. Another group of learners mentioned by two participants of different CAI backgrounds were reluctant learners.

All participants, practicing library-based CAIs, named students with special needs as a group able to benefit the most from these activities. Physical limitations, such as blindness on one eye, dyslexia, Asperger's syndrome were mentioned among the things CAIs can help with. In addition, two of the practitioners in this segment mentioned second-language learners as prospective stakeholders of CAIs.

Typical students were mentioned by practitioners in the school and university contexts. One participant in the university context mentioned stressed, depressed and homesick students. However, she mentioned these students when describing a particular type of CAI – university-based drop-in sessions for students, which are usually organised to target the stressed part of the students.

Gender

In general the participants did not mention gender as a defining factor in who can benefit from CAIs. However, one participant makes an interesting point, saying that girls become emotionally attached to the dogs, while boys are more attracted to the sessions because *'it's not the norm'* (CAI_2). The same participant mentions that according to parental feedback, CAIs can be especially beneficial for reluctant boys:

> But the thing that parents very many times say that, especially boys, if even if they can read that they don't have really like big difficulties with reading, but it's really more this that they just don't want to do it that they are not interested in as they have so many other things.

4.3 Critical inputs

This section describes the opinions of the practitioners in the field of CAI on how and why CAIs can affect the problems discussed in the previous section of this paper. The section consists of four sub-themes: Human-animal bond, Dog interaction, Handler interaction and Underlying Mechanisms.

4.3.1 Human-animal bond

Human-animal bond has been argued to be a necessary prerequisite for any kind of AAI to have effect. The practitioners in the field of CAI expressed two points of view about HAB, which seem to be contrasting, but actually are complementing each other:

> - **natural bond:** the clients, who have a stronger connection to/love of dogs prior to CAI, can benefit more from the sessions (KKKT);
> - **strengthened bond**: the client can form a *stronger* connection with the dog during the CAIs and benefit from the sessions. (READ and FKK)

The underlying assumption under both of the opinions is that dogs are *'a universal language'* and *'everyone knows dogs'* (CAI_7). However, part of the speakers believe that this natural connection is enough for the clients to benefit from the dogs, while the other part believes that this connection can be strengthened and deepened through CAIs.

On the one hand, part of the speakers believe that CAIs only work for people, who are *'inclined towards animals'* (CAI_6). For example, in the case when CAIs is a voluntary activity for the client, if a client is neutral towards animals or allergic to them, they might not want to participate in CAIs and will not benefit from them. Additionally, in the case when a dog is used as a classroom management tool, the effect of CAI is visible because some students naturally care more about dogs than others and these students influence their classmates to behave calmly. Therefore, the dog directly affects only part of the clients – *those who inclined towards animals.*

On the other hand, another group of speakers believe that a connection or even a relationship can be formed with the dog in the course of CAIs. For example, some clients who are afraid of dogs change their opinions in the course of CAIs (sometimes in as short a time as just one session) and the clients who don't want the dogs to be near during the sessions still choose to come and read to the dogs. One speaker mentions *'a special connection'* between her dog and the client, which is formed during two or three initial sessions of the CAI:

> *How could I say? It goes straight into your heart to see it happen. When when they have this connection. And you're not in it. You're not, even though you are three there. So it's between the dog and the reader. And it's somehow it's it's a wonderful thing to see. And it takes you up in the sky and when you see this happened. [CT: Yeah] Probably not in the first during the first time but the second or third session. So this happens and then the fourth or fifth so so they can they start immediately when they meet. So this [unclear] they are merged, they become one somehow. (CAI_1)*

In her case, the setting where the CAI takes place is the library, the client is a child for whom the activity is voluntary, and therefore, it is possible to suggest that the child is already interested in dogs. However, it still takes some time for the *'magic'* to happen.

One trait mentioned by all practitioners is that the clients form a relationship with the dogs: they ask how they are, when they will see them again and even remember them several years after the CAI they took part in.

4.3.2 Dog interaction

All participants in the library and university contexts focused their descriptions on the communication which happens between the client and the dog, while participants in the school context focused on the tasks which the dog can perform when helping the teacher. Dog presence was mentioned as an important element of CAIs by all participants. However, there were differences in how this presence was organised. The two ways of dog presence, identified in the interviews, were labeled by the researcher as 'active presence' and 'assistance'.

FKK: 'Active presence'

This pattern of response was typical for the participants in library and university contexts. The presence of the dog during library reading sessions, drop-in or other sessions in the university is active and, in some cases, proactive. Whether there is interaction between the client and the dog depends almost entirely on the client: it is paramount that the client can choose where the dog will be and whether he or she will be in contact with the dog.

Responsiveness of the dog, however, is seen as important (wagging tail, eye contact, putting a paw on the book), given that the response is appropriate to the wish of the client. In connection to this, dogs are described as having an intuition - they know when and how to react to a particular action. For example, a dog will not interfere with a client who is not interested in being interfered with but will on its own accord approach a client who needs additional support:

> *My both dogs are very experienced so they... if they [stress] are happy... happy that day, they have very good contact with kids. They are very very clever, very wise with the kids. They don't throw themselves on the kids. They can see if the kid is shy, so they... take themselves a little bit back. (M.: Mm hmm.) And if the kid wants to have them in the... very near than they can put their head in the lap... the kid's lap. So they read the kid.* (CAI_5)

In other words, the equilibrium between what a client wants and what the dog does is seen as a crucial element for this type of CAI to have effect. Many handlers note, that ideally this equilibrium should be maintained during the whole CAI session, making the presence of the handler invisible and purely functional.

KKKT: 'Active assistance'

Participants in the school context describe what functions the dogs can perform in the classroom and for what purposes:

> *Another thing the dog... L. does is he rolls the dice and that you can use for... well, the simplest thing is for board games. It works really well if you have a different board game for each group so that they don't all do the same exact question all the time. Or if you have a blank, blank board game, and then just give them different questions. So it works like that. Another thing I've done... an idea I got from another teacher is using kind of guided... guided essay writing. So you have a form with three columns. And obviously six sections and the dog will then roll the dice for the character the problem in the story and then like, where it is set, for example, so I use it for that.* (CAI_6)

Generally, the dogs can: deliver tasks (the task comes from the dog, not the teacher), be an example (the children can create a project for a living creature) and be a classroom management tool (a carrot). Therefore, in this context, the dog acts as a teacher assistant, a reward and a subject of research at the same time. The biggest difference with the library and university context is that the teacher (the dual-role handler) is still very much in the picture when the dog is present in the classroom. The dog takes part of the teacher's work, can play a very central role in a session and be an integral part of teaching, but is not expected to produce change in the clients *on its own*.

Additionally, it seems that presence of the dog inspires the teachers to look at their work at a different angle and possibly be even more involved into it, as one of participants illustrates:

> *...but it's also kind of like once you... once you start seeing your dog as more than your buddy, once he becomes your teaching assistant or co-teacher, at least that happened for me, I mean, whenever I'm somewhere I'm always looking at children's toys or... or like office supplies or whatever, it kind of goes in the back of my mind. Like, how could I use that?* (CAI_6)

4.3.3 Handler interaction

There was a stark difference between how practitioners in library/university context talked about handler interaction during CAIs in comparison to handlers in the school context. First of all, handler interaction in library/university settings was described in relation to the client and to different phases of a session. Below a division of a CAI session into phases with corresponding handler interaction pattern is presented:

Table 9
Handler interaction during CAI sessions in library/university contexts

Phase	Interaction
Before	Two of the participants in the library context mentioned that they have books prepared for the children to read, when they come for a reading session. The participants in the university group participated in diamond AAE, so the teacher played the role of the one being involved in the CAI before (preparing tasks, for example).
Beginning	All of the practitioners interacted with the clients at this stage to 'break the ice': present the situation, the dog(s) and help the clients feel comfortable.
During	Generally, the participants agree that interaction between the client and the handler during the main time of a CAI session is unnecessary and unwelcome. However, the views range from a strong belief that there should absolutely be no interaction to the idea that minimum amount of interaction is possible. For example, one participant mentioned wearing headphones during university-based sessions to remove herself from the context and give the students and the dog as much space as possible (CAI_4). One participant in the library context emphasized several time at the beginning of the session that she is not listening. Two participants practicing reading CAIs claimed that the best CAI session was when they were not visible at all, but anyway encouraged the clients to read or help them with difficulties during the sessions. In such cases, both participants addressed the clients through their dogs. One exception to the 'non participation' agenda is university-based drop-in sessions for stressed students, practiced by one participant, who believes that interaction between the handlers, the dogs and other students is a necessary part of such sessions.
Ending	All of the participants agree that a minimum amount of interaction is possible (e. g. telling how much time is left).
After	Most of the participants believe it is possible to communicate to the client or clients' parents (in the library context) after the sessions. In the library context - to give advice on such things as reading glasses or good books to read (but never on the progress in reading, as the sessions are seen as a private space for the child to read undisturbed and unevaluated) and receive feedback from the children. In university context - to encourage the clients and let them unwind after a stressful situation.

Therefore, the biggest variation of views on whether handler-client interaction should be possible or not was found in regard to the part of the session when the aforementioned dog-client equilibrium is seen as crucial. It seems that the handlers' beliefs were influenced by several factors.

The first factor was the handlers' CAI training backgrounds. Both backgrounds, from which the handlers come from, (R. E. A. D. and FKC schemes) advocate that the handler should not actively participate in the sessions. The second factor was the handler's motivation to become a CAI practitioner and overall experience of working with CAIs. Many handlers employed a '*what I see, I see and what I hear, I hear*' (CAI_1) agenda. For example, the participant who started her CAI practice because she felt that the world needs more people with *'social responsibility'* (CAI_3) generally tried to withdraw into the background during the sessions. However, seeing that the sessions exhausted the students, had to talk to them after the session and encourage them:

> *And I feel that even though during that that presentation, I'm completely silent and invisible, I still.... because the students are really stressed about the presentation. And then afterwards they are kind of empty. So that's when I always start talking with them and I start bringing the dogs closer to them and then they... I can see the change in them.*

Similarly, those participants whose primarily motivation was to help with reading education, could encourage children to read during the sessions, even though they believe handler-client interaction should not be possible. Finally, a participant who strongly advocated for handler non-participation during the session could after the sessions give advice to parents if she saw that the client, for example, needed reading glasses. Such watchfulness, however, seems to be a consequence of

experience. The only participant, who completely withdrew from the client interaction during the sessions, was the participant who had just started practicing CAIs. It would be interesting, therefore, to investigate how the handlers' view of handler-client interaction changes with time.

In the school context, the interaction between the handler and the client seem to be that of a usual interaction between the teacher and her students. An aspect of distancing was identified as one of the handlers mentioned that her dog could deliver tasks to the students so the assignment would come from the dog and not from her.

4.2.4 Underlying mechanisms

As the presence and responsiveness of the dog are crucial elements of all CAIs, this section explores in which ways dog presence produces change in the clients'.

Distraction and relaxation

Four participants across contexts mentioned that the dogs helped the clients forget the stressful situation or otherwise get distracted from it. In its turn, distraction led to general relaxation or coping assistance, depending on the situation in which the CAI was used. For example, in the context of a canine-assisted oral examination in a foreign language, CAI_4 talked about the students *'forgetting their fears'* and *'the classroom situation'* (CAI_4), which led to all the students passing the exam. Similarly, CAI_3 mentioned unconfident students forgetting *'to be nervous about their presentation'*. In everyday situations or situation not connected to immediate stress, CAI_3 talked about students not thinking *'about the exam or MA thesis deadline'* (CAI_3) during a drop-in CAI session. In the school context, CAI_6 described a student who was *'not paying attention to not liking English'* (CAI_6), because her dog was present during the lesson. CAI_5 mentioned that her dog's presence helped young students relax while reading.

Motivation

Different aspects of motivation were mentioned by three participants. In the reading context, CAIs were seen as a way to increases the clients' interest in reading, because of their unusual and fun nature:

> *I think that boys more think that it's... it's special to read a dog and it's a bit it's kind of exciting as it's not the norm. It's not just like reading to a human being but it's something very special. So I think that boys are maybe not so emotional but they think that it's exciting and it's different and it's something they can tell to their friends that well, I have been reading to a dog, yes.* (CAI_2)

In the school context, CAIs were seen as a way to motivate students through making the learning environment more engaging (CAI_6) or incorporating the dog into the learning process (CAI_7). For example, CAI_7 thus describes the use of dog in a mathematics class:

> *Z. [the dog] lives outside. He's not inside dog. (M.: Yeah, he's very big, I guess.) Yeah, and my husband is allergic to dogs. So it had to be an outside dog. (M.: Okay.) Well, he's not just left outside. He has a dog house. And [a fence] around so that he can be always there, left there and he has everything he needs there. So I put students at seven grades, so we have all different kinds of areas. So they get the fence. They... I tell them you have 25 metres of fence. Do a place for zombie. (M.: Yeah.) And they have to do different kinds. So and then they have to count the areas and give me the biggest ones.*

Another aspect of motivation was connected to behaviour regulation: those students who care more about the dog, motivated the other students to behave calmer during the classes (CAI_7).

Agency

Agency was one of the inductive codes, derived from the participants' account by the researcher. Agency was understood as the ability of a student to be active during the learning process (Robertson, 2020).

All participants in the reading context mentioned that CAIs support the clients' agency. For example, CAI_5 believed that it was important that the clients can choose what books they want to read, CAI_1 insisted that whether to read or not should always be the child's choice. CAI_2 described an interesting feature about the children reading to her dog:

> *And one thing is that is very interesting to me. And first, I was a bit surprised, but, but now I'm kind of used to it because really many children think about what kind of books they could read to S.. And first, I was really surprised with well, seven or eight years that they should, they should know that the dog really doesn't understand what they are reading, but they don't think like that. They really think that S. listens and understands everything. So they asked that Well, can I read a book about cats or? This is very exciting, is it okay, if I read this to S.? [...] So it's really like they, they think a lot about this reading situation. And what does it mean to read to a dog?*

In the opinion of the present researcher, this illustrates that CAIs indeed can promote more active engagement with reading and greater agency.

Emotional social support

Two participants in the reading context mentioned that the dog encourages children to read, gives good feedback through its body language:

> *Because the dog never says: 'Don't read like that.' or 'That was wrong.' The only thing the dog says, through me, is: "Marvellous! Very interesting! I like it!"* (CAI_5)

> *And then they are so glad that they read to the dog. Because the dog doesn't criticize doesn't (.) only the tail wags, and, yes, goes up and down. [...]And they are so glad that they succeeded that it was a it was a positive (eh) positive reaction. (CAI_1)*

This was linked to emotional social support which was understood in the study as 'the offering of empathy, concern, affection, love, trust, acceptance, intimacy, encouragement, or caring'.

Mood

Two participants connect the effectiveness of CAIs to mood elevation: good feeling the child gets during reading (CAI_1) and improved atmosphere in the classroom (CAI_6).

Self-regulation and self-esteem

One participant mentions behavioral regulation of the students, as she is using her dog as a reward to the students. One participant in the reading context sees the primary value of CAIs in boosting the client's self-esteem.

Overall

Typically, the participants were talking about two types of situations: ones, which can be identified as stressful situations, or exceptional situations (oral exam, reading aloud, giving presentation in a foreign language, or generally being under stress) and ordinary situations (everyday classroom

situation). The following chart shows which mechanisms were mentioned the most often in association with each of the situations (Table 11):

Table 11
Situations and underlying mechanisms

Exceptional situation (reading aloud, oral exams, presentations in foreign languages or mother tongue, general stressful period)	Everyday situation (a typical lesson)
- Relaxation and distraction, leading to coping assistance - Motivation - Emotional social support (positive feedback) **Only reading context:** agency – emphasis on the importance for the child to be able to choose the book, choose the place where he wants to sit and the dog should be.	- Motivation (dog as an example, dog as a reward) - Behaviour regulation - Improved mood - Distraction, in case of reluctant students

Moreover, there was evidence of interplay of some underlying mechanisms. For example, relaxation and distraction led to coping assistance, while emotional support led to improved self-esteem of the clients.

4.3 Parameters

This section describes the necessary parameters for CAIs to have effects. It includes the following sections: Models of Practice, Dog breed and size, Timing, Space, Dog Well-being and Extra.

4.3.1 Models of practice

The three models of practice discussed in section 1.2.1 of this paper were identified during the interviews.

Client-Animal-Handler (CA(H))

In section 1.2.1 of this paper we defined this model as follows:
> *In this model [...] the handler is a volunteer, whose primary goal is to ensure safety during the intervention. The main focus of such interventions is the interaction between the animal and the client, the interaction with the handler is not implied or is rather limited.*

This model or practice was characteristic of library drop-in reading sessions and, to some extent, to university drop-in sessions. In the latter, however, the handler was involved in conversation with the students and was, indeed, 'hosting' the situation. The involvement of the handler depended on the handlers' initial motivation to do CAIs and prior experience.

Client-Animal-Handler-Professional (CAHP)

This model was defined as:
> *The **CAHP** model [...] implies participation of an animal handler, usually a volunteer, who might not be a professional in the field where AAI is used. In this case, the handler and the professional work in cooperation, fulfilling their respective tasks.*

This model was characteristic of the library or university-based CAIs, arranged with participation of a teacher. Interestingly, this model was indeed based on the principles of *cooperation* – the hander and the teacher were described as playing their respective roles. In both contexts, the teachers were

described as well aware of what kind of students need CAIs the most and which tasks they should be assigned to make them feel successful. Moreover, the teachers were thought of as wanting to make the most out of the CAI sessions by means of turning them into more interactive or reflective events. Consider these two excerpts from CAI_2 and CAI_3:

> *...the children are really waiting for it that they beforehand... they, they talk about dogs and they talk about what kind of books to read and S. has made some videos so so normally the teacher always shows a video or two to the children so they kind of know what kind of dog S. will be. And sometimes the children write letters to S. and give them and this kind of thing so also the teacher often wants to make it not just like two hours when we are there but they want to kind of take all the... what's the word? And try to make most of it...* (CAI_2)

> *And every single time the students appreciate that. So that... it is... The teachers see that it's always they, they record that there's a video camera so that the students can see themselves and they always watch that with the teacher. And they analyse their presentation.* (CAI_3)

The handlers, in their turn, assumed a passive role in this model.

CAIs organised through CA(H) and CAHD models were usually delivered on one-on-one or group basis. Group arrangement usually implied that each participant of a small group was able to communicate with the dog one-on-one for a short period of time. the difference between the two models was that CA(H) sessions were usually longitudinal, while CAHP sessions were implemented only once. This might be connected to the fact that CAHP sessions in our research were mostly used in exceptional situations, such as students giving presentations or passing an oral exam, thus providing immediate, rather than accumulative effect.

Client-Animal-Dual-role handler (CAdH)

The **CAdH** model:

> *...involves interaction between a client and a health/education/social work professional, acting in the role of a 'dual-role handler', who sets goals for the intervention, handles the animal and monitors the client-animal interaction at the same time. In this model, the animal usually belongs to the professional (Fredrickson-MacNamara & Butler 2010, p. 130). The interaction in this case is multilateral, implying that the professional, the client and the animal interact in order to achieve a common goal.*

This model was the most characteristic of the school context. Interestingly, the interaction described by the participants was indeed multilateral and balanced, as no participant of the intervention had to 'step back'.

The types of CAIs and corresponding models of practice identified by our findings are represented in *Table 12*.

Table 12
CAIs and corresponding models of practice

Type	Model	Context
AAA	**CA(H)** client handler ← - - - - - - - - - - - - - - - - → animal	**Library & university drop-in**

AAE	**CAHP** client professional — animal handler	**Library & university arranged with a teacher**
	CAdH client dual-role handler — animal	**School**

4.3.2 Breed or size

The smallest dog breed mentioned as a prospective CAI dog was a Chihuahua (1.8 to 2.7 kg), the biggest breed was a Tibetan mastiff (45 to 73 kg). Dogs of all sizes within this range were represented as well. Some of the participants commented on the size of their dogs. In the library context, small size was generally seen as beneficial as a small dog could sit together with a child in the sofa or even in the child's lap. In the school context, a bigger dog was seen as a better option by one of the participants as its side provided *a 'smaller chance for accidents'* (CAI_7). In general, however, there seemed to be no opinion about what size or breed was better suited for CAIs, as the dog's personality and ability to respond to the client adequately was seen as more important.

4.3.3 Timing

In the reading and university contexts CAIs were usually described as a set of consecutive 15 minute one-on-one or group sessions, lying within one or one a half hours. In the reading context, typically, five 15-minute visits were mentioned either as an average amount of reading sessions a child takes (CAI_2) or as a desirable amount a child should take to benefit from CAIs (CAI_1). In the school context the dog participated in one or more lessons once a week or when the teacher thought the presence of the dog was necessary, for example, to encourage the students to do some practice for the material they have learnt:

> *So for English, I often use... use L. on lessons where we've already kind of started or studied a new text for a little bit, maybe a couple of lessons, so that the kids already have kind of done the basic work and then... the more kind of let's go a little bit further, let's do some extra work.* (CAI_6)

4.3.4 Space

Participants in the library and university contexts reported the importance of the overall environment being as little school-like as possible. In particular, the space was described as open

(CAI_1) to emphasize the possibility for the client to leave the situation at any moment, easy-going (CAI_3) and overall comfortable for all participants of the intervention: having a sofa/beanbags for the participants, water and a place for the dog, a chair for the handler. As for the amount of space, both 'spacious' (CAI_3) and tiny (CAI_4) rooms were mentioned, leading the researcher to believe that the property of space being non-school like was more important than its size.

Participants in the school context conducted CAIs in their designated classrooms. Though this question was not discussed in detail during the interviews, the researcher had a chance to observe one CAI session in the school setting and can, therefore, assure the reader that the space, though small, was arranged to comfortably suit all the participants.

4.3.5 Timing and Space: Dog well-being

One theme inherently connected to the timing and space was that of dog well-being. The participants across contexts talked about the importance of balancing the amount of work for the dogs, making the space comfortable for them and taking safety issues into consideration. For example, CAI_7, a maths and chemistry teacher mentioned not taking her dog to school during one semester at all because she had too much chemistry classes and having a dog present during these classes would be dangerous.

In addition to dog well-being, another common, but minor, theme mentioned by all participants was their attitude towards CAIs as to work. Across contexts, the dogs were often described as hardworking (even *'workaholic'* in case of CAI_2), having their own office space and vacations, and doing a job, rather than 'hanging around' (CAI_6).

4.3.6 Extra

Only one participant in the library context mentioned using extra tools such as a diploma with stickers, which children could get after reading to a dog.
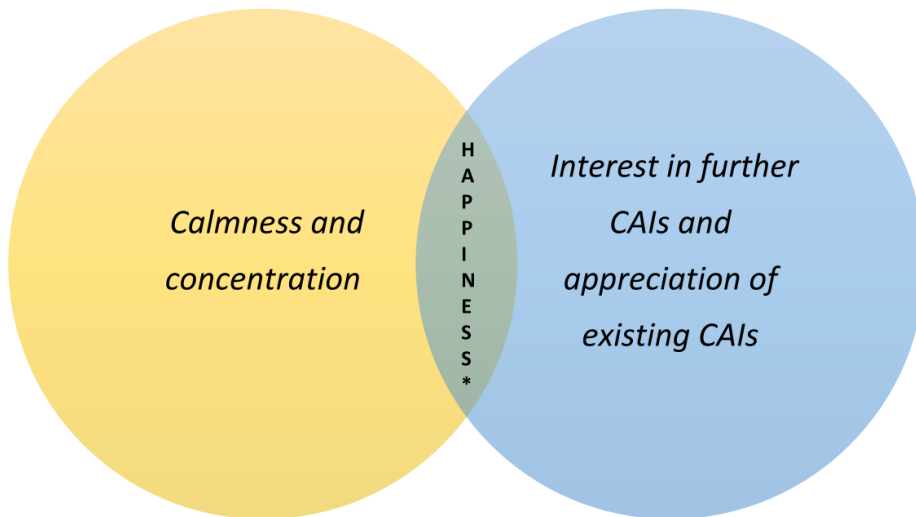
4.4 Outcomes

First of all, we should remind the reader that the goals of CAIs are partially defined by the training organisation. The goals mentioned in section 4.2 of this paper were identified as: encouraging children to read, supporting academic well-being of the students and improving the learning environment.

In previous chapters, we stated that no professional goals were mentioned by the participants in the course of the interviews. Perhaps for this reason the outcomes were assumed and derived through feedback and observation, rather than formally and systematically assessed. Visually, the interrelation between the feedback and observational assessment is represented in *figure 12*.

As one can see from the diagram, such outcomes as the clients' calmness and better concentration as a result of CAI sessions were derived through observation. According to feedback, CAI sessions were greatly appreciated by the clients, their teachers or parents. Additionally, CAIs were in high demand among the clients and they expressed a wish to have more opportunities to participate in them. The overlapping outcome, obtained by the participants from observations and feedback, was the feeling of happiness, which the clients experienced during the CAIs. The participants described the results of CAI, using such phrases as *positive thinking*, *better mood*, *positive feeling in the classroom*. Some participants directly used the word *happy* or *happiness* to describe a good outcome of the CAI: *'the measurement of this is how happy the child is after reading to the dog and how happy the child is with that being himself'* (CAI_1) or *'I can see some very sad students*

coming in and leaving the room smiling' (CAI_3). Therefore, it is possible to say that the primary and desired outcome of CAIs in education is a positive change in the students' attitude towards the learning situation and as a result, towards the learning process in general. This outcome, though it can produce change in learning, is seen by the practitioners in the field of CAI as beneficial in itself.

Figure 12
Outcomes of the CAIs

Additionally, an interesting interplay between the outcomes and the underlying mechanisms of the CAI occurred. First of all, the outcomes, when compared to the mechanisms leading to them, were less diverse. Secondly, the underlying mechanisms could be, but were not seen as sufficient outcome of the sessions. On the one hand, this can be explained by a possible interrelation between the mechanisms and their joint effect on the outcomes. For example, it is not completely clear if increased motivation alone is enough to explain calmness and concentration of the students or if it should be coupled with behaviour regulation. On the other hand, underlying mechanisms and outcomes can influence each other in an interacting manner. In other words, outcomes and underlying mechanisms can exchange places at different stages of the intervention. For example, when higher motivation is achieved, the levels of concentration, happiness and calmness rise. Then these levels arrive at a certain point, they support the level of motivation. Thus a balanced and diverse interplay between mechanisms and outcomes, rather than stepwise progression, may be responsible for the resulting change.

4.6 Summary of the findings

These findings describe the small theories CAI practitioners have about how and why CAIs in educational settings produce change in learning. Below, the small theories are summarized according to the context, where the CAIs were practiced.

In the opinions of the practitioners, CAIs can serve a variety of populations of different ages and genders. Sessions, taking part more than once and held one-on-one, for example reading sessions, have a potential to help struggling readers through emotional social support, motivation and relaxation and distraction. This mechanism has further potential to help stressed and struggling learners with oral presentations during short one-time sessions. Finally, sessions held in a traditional classroom for a whole class can help improve learning environment, through motivation and

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behaviour regulation. Additionally, reluctant students can benefit from such sessions, as the dog has a potential to distract them from being reluctant.

Presence of the dog and the dog's appropriate response to the clients' needs is seen as the crucial element of CAIs. Physical interaction is not necessarily obligatory for the CAI to achieve effect. Presence of the dog leads to relaxation and distraction in stressful situations. Moreover, dogs can serve as motivators in everyday teaching situations or can motivate clients to repeatedly engage in a stressful situation, such as reading aloud. Reacting to the client in an appropriate way, the dog can provide emotional support for clients in stressful situations. In everyday lesson situations, the presence of the dog can help improve behaviour regulation through the students who are more inclined towards animals, who in turn, influence the behaviour of the others in a positive way. The necessity and appropriateness of handler interaction depends on the contexts, in which the CAI is practiced, as well as on the handler's personal and training background.

Interestingly, independent of the context or training received and despite of other differences in aspects of the practiced CAIs, practitioners agreed that a successful result of a CAI in education is the students' happiness, elevated mood and positive thinking. Furthermore, this outcome was in line with the participants' goals, however different they might seem across contexts. All goals included an aspect of improving the clients' attitude towards various situations, be it reading, traditional lesson of English or Maths, an oral presentation in a foreign language or the clients' mother tongue, or the need to submit the Master's paper before the deadline.

Table 12
A summary of themes/small theories of the efficiency of CAIs by context of practice

		Goal	Population	Critical inputs	Underlying Mechanisms	Parameters	Output
Library		- encourage children to read; - make reading more interesting and pleasurable; - support reading education.	struggling students of any age/gender*	**Critically important:** - presence of the dog; - responses/reaction of the dog to the participant. **Ambiguous:** - bond with the dog; - physical interaction; Handler interaction shouldn't happen.	- Relaxation and distraction, leading to coping assistance - Motivation - Emotional social support (positive feedback) **Only reading context:** agency – emphasis on the importance for the child to be able to choose the book, choose the place where he wants to sit and the dog should be.	**Model of practice:** CA(H) or CAHP **Timing:** **Length:** 15 minutes per student **Number of sessions:** 1-6 **Breed or size:** usually small, but temperament is more important **Space:** comfortable, open, as little school-like as possible For **CAHP model** – participation of the teacher	Calmness, concentration, improved attitude (happiness, improved mood, positive thinking)
University		- support academic well-being of the students; - help teachers achieve their goals.		**Critically important:** - presence of the dog; - responses/reaction of the dog to the participant. **Ambiguous:** - bond with the dog; - physical interaction; - handler interaction.			
School		- motivate the students; - creating a more positive learning environment.		**Critically important:** - presence of the dog; - response/reaction of the dog to the participant; - teacher-dog team work. **Ambiguous:** - bond with the dog; - physical interaction; **N/a:** - handler interaction	- Motivation (dog as an example, dog as a reward) - Behaviour regulation - Relaxation and distraction, in case of reluctant students or *exam situation* (stressful situation)	**Model of practice:** CAdH **Timing:** **Length:** one or several lessons **Number of sessions:** once a week or when needed **Breed or size:** big for safety reasons, but temperament is more important **Space:** n. a.	

*Note:* Struggling students were mentioned most of all and by all the participants (except 1 participant). Students with special needs were mentioned by all participants in the library context. Typical students were mentioned in the school context. Some participants also mentioned the ability of CAIs to help ESL students (Finnish as a second language, Swedish as a second language) and reluctant students (especially boys).

V. Discussion

5.1 General discussion

First of all, our findings demonstrate that in the opinions of practitioners, CAIs can indeed produce change in learning through improving aspects of clients' self-regulation, self-perception and motivation as well as by providing additional emotional social support and coping assistance. These findings are supported by previous research in the field of CAI (Hall et al., 2016), as well as broader field of AAT (Crossman & Kazdin, 2015) and AAI (Gee et al., 2017). In addition, similar findings have been reported in studies pertaining to nature-based instruction (NBI), which includes animal-assisted learning as one of NBI types (Kuo, Barnes & Jordan, 2019). However, as it had been mentioned previously, small theories are not intended to provide a unified view of how CAIs in educational settings work. What they are intended to do is describe how specific applications of CAIs work in specific circumstances or situations. Our findings suggest that currently CAIs in educational settings are used in two types of situations. We labeled these situations *learning* and *non-learning*.

Figure 13
CAIs in educational settings in Finland
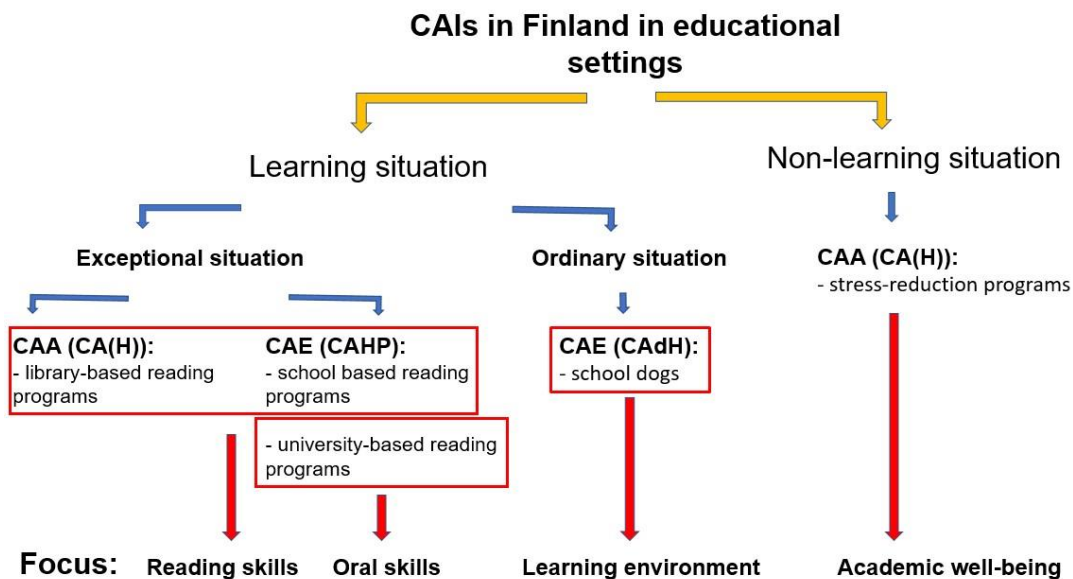
Note: Stressed-reduction programs were excluded from this discussion

Learning situations can be separated into two broad categories of *exceptional situations* and *ordinary situations*. School lessons, where the dog is present on regular basis would be considered an ordinary situation. An exceptional situation, in contrast, is a situation where a dog is not present in the client's habitual learning environment on regular basis. In this case, the client usually has to be taken out of their habitual environment to attend CAI. The examples of this would be coming to the library or leaving the classroom to go to a separate room[11]. According to our research, CAIs in

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[11] Though in case with, for example, a dog visiting children in a school in their habitual classroom once a year this criterion is not supported, the researcher still considers such situations exceptional.

exceptional situations are often focused on providing opportunities for the participants to practice or perform oral skills in the presence or absence of an evaluator. Some examples of this are reading aloud, giving a presentation in native or a foreign language or undergoing an oral exam. CAIs in ordinary situations are used to facilitate skill and knowledge acquisition in school subjects, through influencing general learning environment.

In comparison to learning situations, non-learning situations are not directly focused on helping the participants acquire new academic knowledge or practice skills. An example of a non-learning situation would be university based drop-in sessions aimed at reducing students' level of stress and improving their academic well-being. Though knowledge and skill acquisition *can* happen in the course of this type of CAI, such result would be an addition to the default focus of the intervention, rather than its direct consequence. In order to narrow down the discussion to possible educational benefits of CAIs, we decided to exclude such situations from our discussion.

In addition to the different situations, we discovered that two types of CAIs are practiced in educational settings: CAA and CAE. Furthermore, the latter were practiced through two models of practice – with and without presence of an education professional. In combination with the situations described above, the use of CAIs in educational settings in Finland and their corresponding goals are visually represented in *figure 13*.

Further discussion is structured in accordance to the different foci of CAIs in educational settings. Separately, we discuss commonalities in the practitioners' opinions.

5.2 Small theories

5.2.1 Common opinions

Some commonalities were discovered in the practitioners' opinions in relation to human-animal bond, the importance of the dog's presence and/or physical interaction between the dog and the client, as well as the breed or size of the dog most suitable for CAIs and, finally, handler interaction. These opinions will be summarized in the form of statements and then explored in relation to previous research.

The role of human-animal bond for CAIs is ambiguous

Human-animal bond (HAB) has been described as a unique connection between humans and other non-human animals and has been argued to be a necessary component for interventions which include animals to have effect. HAB helps 'to establish the relationship between the patient and therapy animal' (Fine & Mackintosh, 2016) and, by analogy, client and animal in other contexts. The three theories explaining HAB, which were described in detail in section 1.1, are biophilia theory, social support theory and attachment theory. We decided to investigate if biophilia or social support theory could better explain HAB in educational settings. Attachment theory was excluded from this analysis because it was thought to be more applicable in psychological settings and would possibly require long-term interactions.

On the one hand, our findings indicate that those clients, who have an inclination towards animals can benefit more from the sessions. In the school context, these students would behave calmer in the presence of the dog. However, such inclination could have an avalanche effect: if some of the students saw dogs as more important, they could help regulate behaviors of other students thus influencing the wider learning environment. This finding seems to partially be supported by the

biophilia theory (Wilson, 1984), which postulates that due to evolutionary reasons, the presence of live animals can promote calm behaviour in people even without direct physical contact. Though, biophilia theory has been argued to be one of possible explanations to the calming effect of animals in the wider field of AAI and HAI (Julius et. al, 2013), our findings suggest that biophilic responses seem to be relevant only for certain individuals. This however does not reduce the effect of the CAIs only to those individuals who do have a biophiliac response. This finding is, therefore, at least partially contradictory to Wilson's theory at least in relation to educational settings.

On the other hand, another group of practitioners reported that the bond can be formed during the first several sessions of CAI, after the client and the dog have gotten acquainted with each other. This finding seems to be supported by social support theory, showing that non-judgmental, calm and supportive presence of the dog helps built trust with the client.

Finally, one of the most surprising findings was that clients who were afraid of dogs, or did not want the dogs to be near them during the intervention, still chose to participate in the interventions and seemingly benefited from them. The overcoming of fear of dogs has been mentioned as one of the effects of CAI in previous research (Mercer, 2009). Thus far, no research has investigated cases where clients chose to attend CAI sessions even if they were not intending to interact with the dog so it would be interesting to find out how these clients view CAI.

Therefore, the role of HAB in CAIs is ambiguous. It seems that there is evidence of HAB being beneficial for some students, which can cause spill over effect if CAIs are conducted in groups. Furthermore, HAB can be formed over time. Finally and puzzlingly, clients who have biophobiac rather than biophiliac responses to animals or seem to be neutral to them, still chose to participate in CAIs.

Though the presence of the dog is a crucial element of CAIs, physical contact is not a necessity

Presence of the dog is without doubt a crucial component of any CAI, as otherwise the intervention would not be possible at all. However, whether or not actual eye or physical contact with the dog is necessary, is a different question. Our findings suggest some insights into this question.

First of all, all interaction during the sessions should be voluntary and pleasurable for all participants. As Fredrickson-MacNamara and Butler state (2010) most 'AAA and AAT programs encourage participants to interact with the animals in [their intimate] zone' (p. 141) by touching, stroking or petting them. Such close interaction can be stressful for the animals. We suggest that the reverse is true for the clients – if the dog intrudes into the client's intimate zone without caution, the experience might become frightening. Therefore, it is the handler's responsibility to adequately assess and guide the situation during CAIs, without forcing interaction. In relation to this, our findings indicate that whether actual physical or eye contact with the dog is necessary for the CAI to have effect is depended on each individual client a CAI serves. This finding is supported in the way that there is no agreement in research literature as to whether or not physical contact with the dog is a necessary component for a successful CAI. For example, Beetz and colleagues (2011) established that children experienced less stress during a stressful task the more they were touching a dog. Wohlfarth and colleagues (2014), on the contrary, did not find any correlation between physical or eye contact and reading performance, but established that longer physical contact with the dog correlated to longer reading time.

Dog's temperament and an equilibrium between the client wishes and the dog's actions is more important than the dog's breed or size

Another aspect of the dog's presence during the sessions is the dog's breed or size. Our findings suggest that these parameters are relatively unimportant, as long as the dog has a suitable temperament and has received corresponding training/certificate. This finding is supported by Binfet and Struik (2018), who emphasize the importance "ensuring a match between the temperament and behavior of desired therapy dogs and handlers and the needs of clients" (p. 10). Here again, training handlers to adequately evaluate their dog's ability and decode their dog's signals is a much safer way to ensure everyone's comfort and safety during the sessions, than choosing for a particular dog breed or size (Fredrickson-MacNamara & Butler, 2010).

The amount of handler interaction depends on the type of CAI and the handler's training, professional background and motivation

In addition to dog presence and reaction to the client, handler interaction was considered a critical input into CAI. In most cases, absence of such interaction was considered to be ideal. Many participants expressed the opinion that in learning situations the handler should be as much in the background as possible. For both CAA and CAE conducted in library settings, the only communication possible was indirect communication through the dog in cases when the client was struggling or addressed the handler directly. In the university context, the communication was possible before or after the intervention.

This finding arises from the participants' training background as both READ and FKK training schemes advocate for handler non-participation. This, in its turn, draws on the idea that non-judgmental attitude of animals is beneficent for the clients' motivation and self-esteem as compared to sometimes judgmental or negative attitudes of peers and significant adults, such as teachers (Friesen, 2009). Therefore, the idea of handler non-interaction is focused on creating a positive learning environment and fostering the child's autonomy (Fung, 2019). Generally, this attitude is reflected in broader research in the attempts of the researchers to separate the effect of the dog from the possible effect of the handler (Beetz et al, 2011; Grajfoner et al., 2017).

However, our findings show that the factual dynamics of interaction is more complex and depends on many factors, including the handlers' motivation to do CAIs, their professional backgrounds and the stage of a CAI session.

In the reading context, handlers' position is unique, as they are not restrained by curriculum demands and can focus their attention on helping each individual client. Educational background in librarianship, for example, provides handlers with expertise in the area of children's books and reading in general, which could be beneficial for the clients. Therefore, it is not clear whether or not all interaction during the session should be restricted or, on the contrary, promoted. As Friesen (2009) puts it the handler can provide 'responsive assistance guided by the child's unique questions and struggles as he or she reads' (p. 119) and put the child in the role of the teacher by asking him to explain difficult words to the dog, thus possibly improving the child's self-confidence and self-esteem.

In the university context, the desire to do volunteer work and help people motivated handlers to communicate with the students immediately after the sessions to give and receive feedback and provide support for the stressful situations. To the best of our knowledge, the effect of such interaction has not yet been investigated in research literature.

Finally, in the school context, separating the dog from the handler, and, therefore, separating the effect of one from the effect of the other, was impossible. This finding will be discussed in more detail in section 5.2.4 of this paper.

Therefore, though the general trend of research is to try and separate the effect of the dog from that of the human, it seems that forcefully excluding handler interaction from all stages of a CAI session is contradictory to the nature of these interactions, as described by our participants.

Having discussed the common opinions of CAI practitioners across contexts, we further discuss the goal, population, underlying mechanisms, parameters and outcomes components of small theories in relation to the focus of each intervention. As shown in figure 13, the foci are: reading skills, oral skills and learning environment.

5.2.2 Reading skills

Supporting the development of reading skills was in focus of two types of CAIs: CAA, delivered through CA(H) model in library settings and CAE, delivered through CAHP model in library or school settings.

The small theory of the effectiveness of these types of CAI can be visually represented as follows:

Figure 14
Small theory on the efficiency of CAIs for reading skills (CAA with CA(H) and CAE with CAHP model)
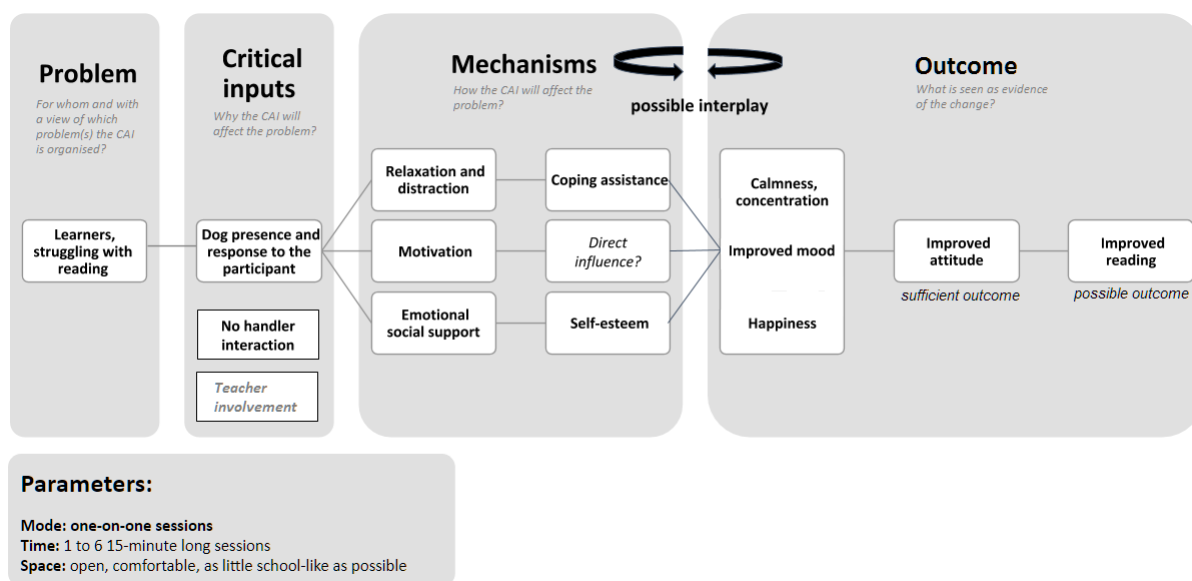
Note: In grey – the role of the teacher is only applicable for CAE with CAHP model.

First of all, this small theory generally corresponds with Hall and colleagues' (Hall et al., 2016) framework of the possible effect of reading to dogs on reading performance (***fig. 10 in this paper***). However, the interplay between the mechanisms and the outcomes seems to be seen differently in the two frameworks. In Hall's framework mood elevation and the change in arousal levels (*increased or decreased arousal*) are seen as the two main mechanisms leading to changes in engagement with and attitude to reading, as well as reading confidence and motivation. In our framework, motivation is seen as directly influenced by the dog presence, rather than as mediated by other factors. Additionally, decreased arousal is seen as both a mechanism (*relaxation and*

distraction) and an outcome (*calmness and concentration*) of the sessions. Finally, mood elevation is seen as one of the results of the intervention, rather than one of its active mechanisms.

These differences can be explained by a possible non-linear nature of the dog's influence. Both, Hall's and our framework strive to separate the mechanisms from the outcomes and describe them in a linear way. However, in practice, clearly separating one from the other can be impossible. Presence of the dog seems to simultaneously influence multiple interrelated factors and create chain reaction effect. Thus, depended on each individual reader, motivation can be both a mechanism supporting improved mood and the outcome of the improved mood. Similarly, improved attitude to reading can lead to greater reading motivation and result in greater self-esteem of the reader, which, in its turn will support motivation in the long run. Such nature of CAIs would further support Kazdin's (2017) proposition to establish proof of the effectiveness of AAIs through multiple studies with tailor-made small theories. Furthermore, if the chain reaction effect can be proved, whether it is self-supporting after the intervention deserves further investigation.

According to our findings, the populations, which could be best served by this type of CAI, are elementary age students, struggling students and students with special needs. This is in line with Hall and colleague's (2014) systematic review of literature on children reading to dogs, studies done by Newlin (2003) and Beuche (2003), as well as more recent studies such as Fung (2017, 2019, special needs) and Rousseau and Tardif-Williams (2019, elementary age, struggling readers). Though some researchers argue that school-wide CAIs, arranged in collaboration with teachers, can be beneficial for all students (Kirnan, Siminerio, & Wong, 2016; Kirnan, Ventresco & Gardner, 2018) as our participants did not report participation in such programs, we are unable to support this statement or argue with it.

The underlying mechanisms, discovered by our findings, are consistent with the previous research on the topic (Beetz & McCardle, 2017; Hall et al., 2016; Wohlfarth et al., 2014). For example, Wohlfarth and colleagues (2014) cite the following theories, explaining the possible effects of dog-assisted reading programs, predominant in research literature: motivation theory, self-worth theory and stress-reduction theory. According to the motivation theory, animals can increase intrinsic motives of children to perform tasks. Self-worth theory postulates that animals can offer non-judgmental support to children and thus help boost their self-esteem. Finally, according to the stress-reduction theory, animals are able to calm down learners and so provide coping assistance during stressful activities (p. 62). All of these theories are in line with our findings. Beetz & McCardle (2017) also cite motivation and stress reduction via social support among the prerequisites to learning, which are affected by reading to dogs (pp. 117-119).

As for the parameters of this type of CAI, our findings suggest that 1 to 6 15-minute sessions of reading to a dog are generally seen as sufficient by the practitioners. The 15-minute rule is generally recommended by READ and FKC training schemes, while the duration of each program can be defined by each practitioner separately, depending on the institution where the CAI is provided. Consequently, sessions of 15-20 minutes are generally used in research on the effects of CAI on reading, while duration of the interventions varies from 5 days to a full academic year (Hall et al., 2016). Therefore, more research is needed to establish how long canine-assisted reading interventions should last to produce change.

The space in which CAIs take place should be comfortable, open and as little school like as possible. In research literature the space parameter is usually addressed through a description of whether or not the students were taken out of the classroom and justification for this (Le Roux, Swartz and Swart, 2014; Fung, 2019); through description of the reading place organised within the

classroom (Kirnan, Ventresco & Gardner, 2018; Kirnan, Shah & Lauletti, 2020) or another educational institution, such as a library (Lenihan et al., 2016). However, the effect the space might have on the participants is rarely addressed separately. To the best of our knowledge, research focusing on comparing the effects of CAI implemented in different setting is absent.

The role of the teacher is an additional parameter to be considered when CAIs are implemented with CAHP model. Our findings suggest that the teachers not only chose children for participation in dog-assisted reading sessions, but integrated the dog sessions into the broader teaching context, by suggesting that the children write letters to the dogs, watching videos about the library dogs and discussing them in the classroom. Current research suggests that the fuller the CAIs are integrated into the curriculum, the more pronounced their effects (Kirnan, Ventresco & Gardner, 2018).

Finally, the sufficient output of such interventions, as reported by our participants, is the child's calmness, happiness and improved attitude to reading. Sometimes, the participants mentioned improved reading performance as well. However, the handlers always stressed their subjectivity in assessing actual reading skills. These findings are in line with both Hall and colleagues (2016), Gee and colleagues (2017) and contemporary studies, drawing on these two works, such as Rousseau and Tardif-Williams (2019) and Linder and colleagues (2018). Rousseau and Tardif-Williams (2019) concluded that through motivation, coping assistance, and increase in self-perceived reading competence canine-assisted reading sessions 'may create an environment in which the child experiences more positive feelings in relation to the situation despite the challenges presented' (p. 672). Linder and colleagues (2018) found that reading to a therapy dog improved attitudes toward reading in a group of second graders, while failing to find any improvement in actual reading skills. Therefore, the fact that improved mood and happiness of the children were seen as a valuable goal in itself seems to be supported by research.

5.2.3 Oral skills

The focus of CAE sessions organised through CAHP model in universities was mostly support and development of struggling students' oral skills. Typical arrangement for this model of practice is a teacher choosing a student or students, who would benefit the most from the CAIs and arranging a CAI session for them. The oral skills in focus are giving presentations in the students' mother tongue or foreign language. Another aspect is helping the students to pass their oral exams. Such sessions are usually organised as separate sessions, rather than a series of sessions. Therefore, they have an immediate effect. The small theory explaining the effectiveness of such sessions is represented in *figure 15*.

Previous research demonstrates that students' stress, as measured by the hormone cortisol, is higher before and after oral exams, as compared to written exams (Preuss et al., 2010 as cited in Barker, Barker, McCain & Schubert, 2017, p. 36). Moreover, it has been found that oral presentations in general cause stress and increase state anxiety (Merz et al, 2019), while speaking a foreign language can be hindered by foreign language speaking anxiety (Horwitz et al., 1986). All these factors taken separately or together can negatively influence students' academic achievement. According to our findings, the possible stress-reduction effect of dogs can help relieve students' stress during oral skills performance, thus providing them with coping assistance. These findings are in line with the wider literature, discussing possible stress-reduction effect of dogs (Ward-Griffin et al., 2018; Jarolem & Patel, 2018; Crump & Derting, 2015; Barker, Barker, McCain & Schubert, 2017).

Figure 15
Small theory of the effect of CAIs on oral skills (CAE (CAHP) with model)
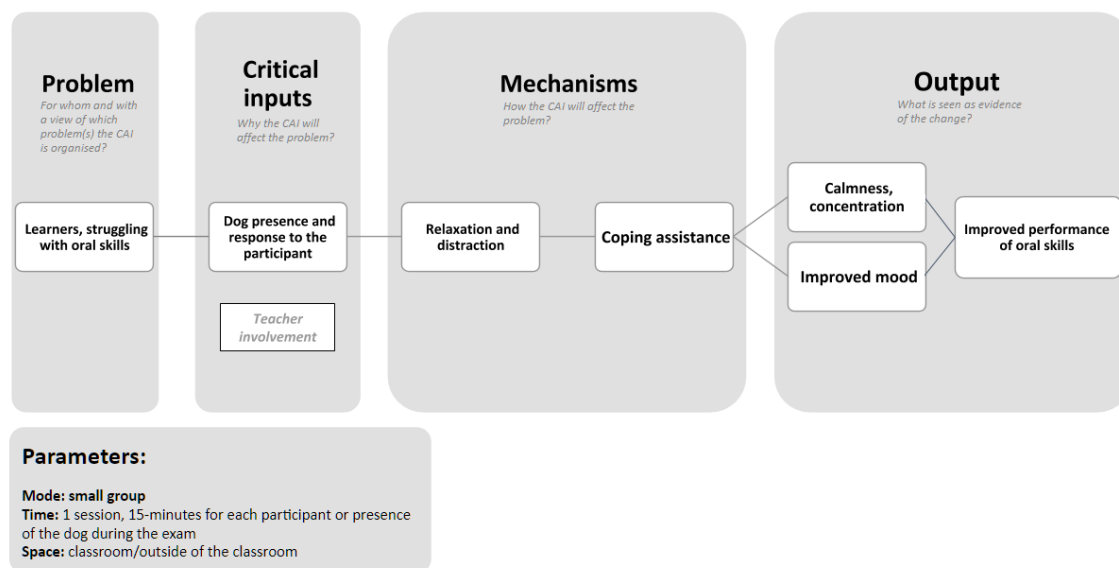
Additional value of such programs is their relatively short time. According to our findings, such sessions are usually organised in 15-minute slots, during which the students have a chance to give a presentation and answer follow-up questions, undergo a mock job interview or ask an exam question. This finding is supported by research indicating, that CAI sessions lasting 5 to 10 minutes, can help reduce students' immediate stress and anxiety (Crossman, Kazdin, & Knudson, 2015). According to our participants, as in the case with CAIs aimed to improve reading skills, taking the students out of the classroom into a more laid-back environment may contribute to the effects of CAI. However, the effect of space on CAI is still underinvestigated in research literature, probably due to wider concerns of investigating whether or not the effects of CAI can be attributed to them in general.

Students' happiness, improved mood and willingness to participate in more CAI sessions were considered sufficient outcomes of the sessions. To the best of our knowledge, there is no research into the effect of CAIs on students' oral skills, but there is a vast body of research focusing on stress-reducing effect of dogs, which demonstrates that dogs can improve students' mood (Grajfoner et al., 2017) and well-being (Binfet, 2017; Ward-Griffin et al., 2018).

5.2.4 Learning environment

CAE as practiced in schools through CAdH model most closely aligns with what we labeled as *school dogs* in section 2.2.1 of this paper. The small theory about how and why CAIs of this model produce change in learning are represented in *figure 16*.

For research purposes the particular learning problem, which this type of CAI is intended to solve (if any), and the particular learning outcome, measurable by tests, can be defined by the teacher. However, in practice the problem is conceptualized through goals, which teachers have when bringing dogs to the classroom.

Figure 16
Small theory of the effect of CAIs on learning environment
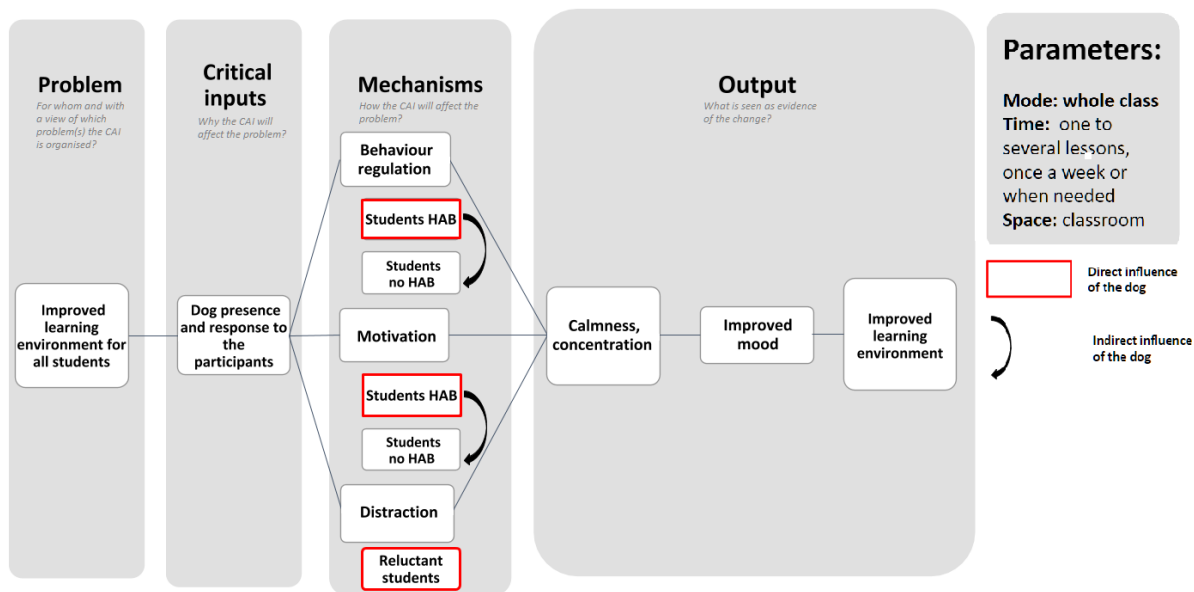
According to our findings, the primary goal of such CAIs was to motivate the students and create a more positive learning environment. Motivation could be achieved through using the dogs as a prompt, an example or a subject of research. Learning environment was improved as a result of using the dog as a classroom management tool (or *reward*). These goals are in line with the most common goals for bringing an animal into the classroom as reported by teachers in a poll conducted by Rud and Beck (2000). Furthermore, similar goals were reported by teachers, practicing CAIs in schools in Germany (Beetz and Marhofer, 2012b as cited in Beetz, 2013). The ways of using the dogs to achieve the goals, reported by the participants coincide with the most common ways to use a dog in the classroom as reported by Beetz and Marhofer (2012a as cited in Beetz, 2013) and by the findings of a qualitative study into the use of dogs in the classroom (Mercer, 2019).

The practitioners emphasized that CAIs were beneficial for all students, including those without difficulties in learning. This finding is supported by Hediger (2017), who in a study measuring children performance on neuropsychological tasks, found that CAIs can be beneficial for 'a majority of children, and not only for children with special needs' (p. 32). The findings of this study further showed that for the CAI to have effect dog ownership and/or established relationship with a dog was unnecessary (p. 32). In our case, there is evidence that those students who had stronger bond with the dogs influenced behaviour and, consequently, motivation of the students, whose bond with the dog was weaker or absent. Students with a stronger bond were motivated by dog presence and regulated their behaviour in order to be able to keep the dog in the classroom. Furthermore, they were restricting their classmates' disruptive behaviors, such as shouting, in order to protect the dog's well-being. This raises an interesting question of why these students were prepared to reprimand their distracting classmates when the dog was present, but not when it was absent.

This situation can be partially explained by *cute response*. Cute response is a mechanism, which triggers caretaking behaviors in humans as a response to baby-like facial and behavioral features in another human or animal (Borgi & Cirulli, 2016). Though none of the dogs in the school context of our study had particularly baby-like facial features (e. g. large round eyes, small nose, round cheeks), their subordinate position and inability to express their own preferences and feelings through language might have put them into infantile position in the eyes of the students.

Additionally, a consequence of *cute response*, 'older-younger sibling dynamic' often found in child-dog relationships might have been responsible for the students' protective behaviour (Melson, 2005 as cited in Fung, 2017). Establishing whether dogs with child-like (e. g. pugs) or adult features (e. g. collies) would be more successful in triggering students' caretaking behaviors would be a useful direction of further research.

A separate group of students who could be served by CAIs were reluctant students. Our findings suggest that direct physical contact with a dog during a task can distract such students from their negative attitude to the subject and motivate them to participate in the task. This finding is somewhat supported by the results of a survey conducted by Beetz and Marhofer (2012b as cited in Beetz, 2013). According to the survey, 'some dogs supported certain students during difficult tasks, being close during tests or while practicing reading in a corner' (p. 1). Though it is unclear from this passage which students the dog assisted in this way, the description is close to how one of the participants described her dog's behaviour in relation to a reluctant student.

The critical inputs of this type of CAIs were, similarly to the other models, presence of the dog and reaction of the dog to the participants. However, an additional element of the teacher-dog teamwork was identified, suggesting that the effect of the dog cannot, and probably should not, be separated from the effect of the teacher in CAIs provided through this model. This finding is supported by Beetz (2013), who argues that the presence of the dog in the classroom might also have a positive effect on the teacher's behaviour and mood (p. 2). In addition, our findings suggest that using dogs in their work can motivate the teachers to be more engaged with the teaching process, as both of our participants reported high involvement with the process of planning lessons with the dog.

As this type of CAI suggests high teacher agency, this type of CAI was the most ambiguous to make any inferences about its parameters. First of all, in this type of CAI the dog becomes an integral part of the clients' habitual environment. It is reasonable to suggest that the effect of the dog on space or the students' perception of space should be investigated in this case. Furthermore, the timing of such CAIs seems to be tied to the teacher's aims and motivations, as well as concerns for dog well-being. Therefore, more research is needed in this area as well.

Finally, one of the outputs of such CAIs was improved concentration. This finding is supported by Hediger (2017). She compared the frontal lobe activity of children performing various tasks in the presence of a living and a robotic dog. In the presence of the living dog, the frontal lobe activity, which served as an indicator of increased attention, was maintained during the 1 hour time of the intervention. In the case of the robotic dog, attention steadily decreased and was the lowest at the time when the children needed to perform the most challenging of the tasks. Furthermore, a number of outcomes associated with improved attitude to the learning situation were found, such as improved mood or happiness. This finding is supported by Beetz (2013), who found that an entire class of elementary students improved their attitude towards school and learning during the period when the dog was present in the classroom.

5.3 Definitions: a reflection

Though clarifying definitions in the field was not the author's intention, several important observations on the nature of CAA, CAE and CAT, and consequently AAA, AAE and AAT, were made during the course of this research[12].

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[12] In this discussion, we use the abbreviations AAA, AAT, AAE referring to the general use of animals in various settings. We use CAA, CAT, CAE as specific examples of AAIs, and extend conclusions made about them to the general field of AAI.

In 1.2.2 of this paper we cited the goal of the intervention, its model of practice, the amount of structure and the fact of documenting and evaluating the goals as defining factors in specifying the type of AAI. However, our research suggests that the type of AAI can be sufficiently defined at the intersection of its general goals and its model of practice.

First of all, though the interview data from the practitioners engaging in CAT was excluded from the final analysis, their accounts generally demonstrated that CAT was implemented by healthcare professionals and was characterized by having personalized goals and a high amount of structure. For example, one of the participants practiced AAT in rehabilitation work and with people with intellectual disabilities. When talking about the sessions, she emphasized the tailored nature of her approach, which manifested, for instance in the choice of an appropriate animal. She used several animals, including dogs and donkeys, and the choice of animal depended on her client's needs and goals. This was in line with the general perception of AAT as tailored to the needs of the clients', provided by a professional and highly structured *(AAII, 2020;* Kirnan, Siminerio, & Wong, 2016*)*. The distinction between AAA and AAE was less clear in research literature (Kirnan, Siminerio, & Wong, 2016).

According to AAII, one of the defining traits of AAE as compared to AAA is that AAE includes 'specific goals for each individual involved and the process is documented and evaluated' *(AAII, 2020)*. However, regardless of the practiced CAI, none of the participants of this research mentioned any specific goals, documented or evaluated the process in any formal way. Commenting on this, one of the participants of the study, a teacher, suggested that as dogs become an integral part of teaching, separating educational *goals with dog* from *goals without dog* becomes impossible. Moreover, as CAIs in educational settings are sometimes practiced in groups, defining individualized goals becomes difficult. A connected issue is the amount of structure present in AAAs and AAEs.

AAAs are generally defined as less structured or instructed, while AAEs are perceived as highly or more structured (Kirnan, Ventresco & Gardner, 2018). In the opinion of the present researcher, the amount of structure can be defined differently, depending on the viewpoint of the investigator. If the investigator is an institution, a client or any other interested individual, not directly involved into AAI, their view point is rather external, while practitioners in field have an internal viewpoint.

Therefore, external structure would refer to how AAI is embedded in the context of the institution and/or the client's life. For example, the extent to which an AAI is organised on a fixed, regular basis and serves a particular, long-term goal. AAAs would be organised on a 'drop-in' basis and have no fixed goals. While AAEs would be organised regularly and serve a particular goal. In this understanding of structure, CAIs discussed in this study fail to clearly fall under the two categories of CAA and CAE. As it was mentioned in the Findings chapter and emphasized again at the beginning of this section, no fixed goals were mentioned by the practitioners. Moreover, in one case, school-based CAI was organised when it was needed in the opinion of the teacher, rather than on a regular basis. The idea of the internal structure is connected to this finding.

Internal structure, in our understanding, is the amount of involvement of the practitioner into planning and implementing an AAI. One of the participants of our study reported a highly structured approach to CAI: she designed dog-assisted interventions with the view of Finnish National curriculum in mind and created tens of ways to use her dog in the classroom to help her with teaching difficult mathematical concepts. The other teacher reported a more creative approach which could be described as a deeper involvement with the teaching process and constant reflection on how the dog can be used in the classroom.

Figure 17
Present research CAIs on AAA/AAT continuum
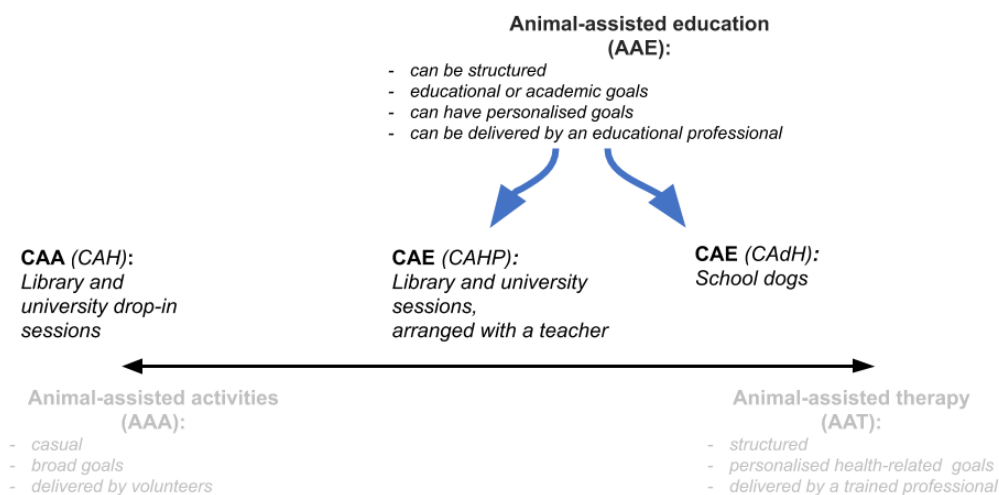
Thus, the approach of the two teachers was different. However, both of their interventions were defined by us as CAE. This was done at the intersection of the general goal of these interventions, which was related to education, and its model of practice, which implies participation of an education professional. Therefore, the simplest sufficient characteristics of CAE are that it is practiced by or in collaboration with an education professional for the purposes lying within the scope of educational profession. The amount of structure, the absence or presence of individualized goals and their evaluation will depend on a particular situation, where CAE is practiced. These factors should be kept in mind and considered separately, when designing interventions or CAI research.

One way to consider these factors is to place a particular CAI on the AAA/AAT continuum, proposed by Kirnan and colleagues (2016). The way CAIs discussed in this paper can be placed on the continuum is shown in figure 17.

We believe that placing a particular CAI on the continuum, while designing research, can help researchers to better identify and describe the intervention to the general public and academic community, as well as justify choices, such as presence or absence of formal evaluation, for themselves.

VI. Conclusion

6.1 Researcher reflexivity

In qualitative studies, the researcher acts as the instrument 'through which data for their studies are collected or generated' (Chenail, 2011, p. 255) and is closely engaged with the data and the participants throughout the whole process. Thus, researcher bias can not be fully avoided in qualitative research, which is a threat to internal validity (Tong et al., 2007). However, as recommended by Creswell and Miller (2000) the validity of a qualitative study can be improved through researcher reflexivity. Domain 1 of *Consolidated criteria for reporting qualitative items (COREQ): a 32-item checklist* (Tong et al., 2007) is used here to aid the researcher in the reflexive process.

6.1.1 Personal characteristics and their implications for research

The author and the sole researcher of this study, is a female Master's Degree student in Education and Learning in the University of Turku. The researcher has an educational background in Early language education and intercultural communication (MA) and a professional background in teaching English as a foreign language in her home country. The researcher has no previous experience with CAI, but is greatly interested in dogs and animals in general.

Love of animals could have been a threat to the present research if the aim of this study would have been to establish whether or not CAIs produce change in learning. As demonstrated by a previous systematic review into AAIs in the classroom, the field is prone to positive publication bias (Brelsford et al., 2017) and most of its evidence derives from anecdotal evidence of people who obviously love animals (Hall et al., 2016). However, as in this research the effectiveness of CAIs was assumed and the process of establishing which mechanisms lead to the possible effects of CAI was based on existing frameworks, it is unlikely that the researcher's attitude to animals prompted the researcher to be overly positive. On the other hand, the researcher's choice of deductive approach as the starting point of data analysis could be seen as limiting. As the researcher is relatively inexperienced in the field of CAI, she might have been inclined to look for the themes, suggested by the pre-defined code-book and miss other possible themes. Rigorous data familiarization, reliability and member checks were intended to remove this bias.

Finally, developing and conducting high quality open-ended interviews requires skills, which can only be developed through practice (Chenail, 2001). Therefore, the role of the qualitative researcher as the instrument of data collection and analysis (Chenail, 2011, p. 255) is a possible cause of inaccuracies in instrument development and implementation. As the instrument for this study was developed by the researcher, based on previous unpublished work (Schlote, 2006) and peer-reviewed literature (Kazdin, 2017), it is unclear whether the instrument was accurately designed to answer the corresponding research questions. Pilot interview, reflective note-taking and mapping the elements of small theories on the interview guide were ways to address these possible limitations.

6.1.2 Relationship with participants

No relationship between the researcher and the participants was established before the beginning of the study. When the participants were first contacted, they were informed about the researcher's

credentials and research interest. A common assumption by both the researcher and the participants was that CAIs *do* produce change in learning and *are* beneficial for the clients.

During the interviews, however, a certain connection and mutual liking was developed between the researcher and the participants. Many participants expressed interest in reading the final work by the present author. This could have put pressure on the researcher and encourage her to omit or exaggerate certain aspects of CAIs. Withal, it was the author's intention to conduct a member check with the participants from the very start of the project. Following Bazeley's 'Describe-Compare-Relate' formula (2009, p. 10) aided the researcher at creating a holistic description of the findings.

6.2 Limitations of the study

First of all, the findings of this research represent small theories, which practitioners in the field of CAI in Finland have about how and why CAIs produce change in learning. Though the findings are supported by previous research literature, both drawing on anecdotal evidence and rigorous research designs, the findings are not representative of the entire population. As the final sample included only 7 practitioners in the field of CAI, it is possible that more small theories could be drawn from further investigation, more situations where CAIs are used as well as more combinations of the type of CAI and the models of practice could be found.

Another consideration is the moderate level of inter-rater reliability of coding found after the process of coding was completed. The question of whether or not inter-rater reliability should be calculated in qualitative research is a contradictory one (McDonald et al., 2019; Roberts et al., 2019). On the one hand, establishing inter-rater reliability seems to be relevant when a group of researchers works on a project from the start to ensure coherence in their understanding of the topic and interpretation of the results. In such cases inter-rater reliability can be established already at the stage of codebook creation (Roberts et al., 2019). Such approach would be desirable, but was not possible in this study as the researcher worked alone. Though there is evidence that in cases where researcher works alone, measuring inter-rater reliability is not appropriate, the interpretative nature of analysis prompted us to check the level of agreement (McDonald et al., 2019). The resulting coefficient of $k = 0,64$, achieved through discussion, was moderate. In combination with a high coefficient of intra-rater reliability ($k = 0,88$), this result was interpreted as satisfactory for several reasons. First of all, there is evidence in broader literature that even experience coders, though identifying the themes arising in the data correctly, 'pack' them differently (Armstrong et al., 1997) and we believe that is what happened in our research. Visual observation revealed that the second researcher coded essentially the same extracts of text to the same categories, therefore identifying the themes correctly. However, she did not include as many text extracts, as the present researcher, or omitted repeating instances of the code. In addition, the second researcher was not involved in the study from the beginning and could not dedicate as much time to studying the coding framework, as the present researcher. This might have been another reason contributing to differences in coding.

Finally, though the findings of this research are not generalizable to the entire population, the proposed small theories have practical implications for future research.

6.3 Research summary and suggestions for future research

The aim of the present study was to support further research into CAI in educational settings by providing *small theories* about the effectiveness of CAIs in various educational settings. The overall composition of the small theories was informed by Kazdin (2017) and Leviton and Lipsey (2007).

The possible underlying mechanisms and critical inputs were drawn from the existing research on CAIs in educational settings (Hall et al., 2016; Crossman & Kazdin, 2015; Gee et al., 2017). The framework, described in Section 2.3 of this paper served as a basis for this research. The obtained small theories, discussed in more detail in section 5.2, provide investigative frameworks relevant to the various educational or education-related goals and various types of CAIs in educational settings.

The main research question of the present research was *How and Why CAIs produce change in learning, in the opinions of practitioners in the field?* This research question was addressed through a number of smaller research questions, linked to the elements of a small theory. In order to answer the research questions, an interview guide was developed based on previous research literature and an instrument applied in previous research (Schlote, 2009). Data was collected through semi-structured interviews with practitioners in the field of CAI across different educational contexts. Data from 7 of the interviews were analyzed with the help of thematic analysis (Braun & Clarke, 2006).

Summarizing the study, we can conclude that CAIs have a possibility to serve the needs of struggling learners, while also being beneficial for students with special needs, ESL students, reluctant students and typical students. CAIs in education aim to improve the clients' reading and oral skills, to support their academic well-being and provide them with a more positive learning environment. CAIs influence educational goals indirectly, through improving aspects of the learners' motivation, self-perception and self-regulation. Moreover, CAIs provide emotional social support and coping assistance. As a result, the clients' attitude towards learning situations improves, their mood and happiness levels rise. This is seen as a valuable outcome of CAIs across contexts. This improvement happens as a result of the presence of the dog and the dog's adequate response to the client. Actual learning outcomes are not measured by the practitioners; the tools used to evaluate the effectiveness of CAIs by practitioners are observation and feedback.

Interestingly, the outcomes of the interventions were less diverse than the mechanisms, assumingly leading to them. In a way, the mechanisms, could be, but were not, seen as sufficient outcomes in themselves. Further investigation could explore a possible interrelation of the mechanisms and the outcomes, as building upon each other in a chain reaction manner.

Some of our findings were ambiguous and produced more questions than answers. For example: *What role does human-animal bond play in CAIs? Is physical contact with the dog necessary to achieve results? What is the role of handler interaction in CAIs across contexts? How (and if) should it be regulated? How does teacher engagement influence the outcomes of CAIs? What influence does the space where CAIs are held have on its outcomes? What is a sufficient timing and amount of sessions needed for CAIs to be effective?* Some of these questions, such as the role of HAB, handler interaction and timing, have already been addressed in research literature, but have not received a conclusive answer. Some of the questions are yet to be asked by future research.

Our research contributes to the field of CAI by answering the call of Gee and colleagues (2017) to challenge or confirm the model of the effect of HAI on learning (p. 6). Taking the challenge one step further, we integrated several existing frameworks, striving to explain the effect of CAIs on learning and created a unified investigative framework for this research. Furthermore, we followed Kazdin's (2017) call to develop *small theories* in order to improve the evidence base of AAIs. Moreover, our research is one of the few examples of qualitative studies in the field, which can contribute to its deeper understanding.

The small theories, constructed during this study, have practical implications for future research as they provide a ready set of variables for new investigations. When designing interventions, future researchers can address small theories as a starting point, according to the type of CAI they are interested in, the population they wish to study and the educational focus of their investigation. Critical inputs of the interventions, their possible underlying mechanisms and outcomes will serve as a guide to organizing the interventions and measuring their effect. Additionally, the small theories can be used by novice practitioners in the field of CAI if they wish to design more structured CAIs or understand the mechanisms, underlying CAIs deeper.

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Appendices

Appendix A: Email request for an interview

Dear [*Name of the Participant*],
You are reading this letter because [*name of the referee*] advised me to ask you to be a participant in my research.
My name is Marina Pliushchik. I am a Master's Degree student at the University of Turku, writing my Master's thesis about canine-assisted interventions (CAI) in Finland.
My research includes interviewing people who work with canine-assisted programs on different levels and in different educational settings. I am interested in talking to everyone: professionals, volunteers, dog-handlers, teachers who take their dogs to the classrooms – everyone who is involved in canine-assisted work. I hope that the interviews can help me understand:
-       which problems can be successfully addressed through canine-assisted interventions,
-       which populations can benefit from these interventions the most,
-       which components of such interventions are crucial for the intervention's success.
My idea is to analyse the interviews and see which ideas are common for practitioners in the field of CAI. Based on the analysis, I am planning to inform further research in the field of canine-assisted interventions.
That is why I would like to ask you to participate in an interview with me.
The duration of the interview is around 40 mins – 1 hour.
It can be organised face-to-face or online (via Skype).
If you agree to participate in the interview, I will need to record it for further analysis. The recorded interview will be anonymised and stored on my password-protected computer. Only I and my supervisor will have access to the whole data. If you agree to it, part of the data can be reviewed by one of my classmates to ensure validity of my research conclusions. The data will only be used for research or publication purposes (if you agree to it). Before publishing anything, I will send the piece of writing to you.
If you agree to participate, I will send you the list of questions which we are going to discuss during the interview.
If you have any further questions, please, contact me!

Warm regards,
Marina Pliushchik

Appendix B: The interview guide and the elements of a small theory

Question	Follow-up questions	Kazdin's 'small theory approach' (2017)
Q. 1: What is the term you prefer to use in your daily CAI practice?		*Warm-up*
Q. 2: Tell me about yourself: your general education and work experience.	• Is your formal education in a social service, education, health or helping discipline? In **which field**? • Are you currently working as a professional in this field? • How many years of experience do you have in your profession? **More informal:** What do you do and how long have you been doing this?	*Background information* **Key components:** Models of practice
Q. 3: How did you get into the field of CAI?	You: • How many years of experience do you have in CAI? • How did you become a CAI professional? & Why? • Do you have any training related to AAI? -> Which program, institution or organization? Your **animal partner**: • Do you use your own animal(s) in your work? • Have [your animal] been tested or trained for this type of work?	*Background information* **Problem definition:** Goals **Key components:** Models of practice Dog breed or size

Q. 4: Describe a typical CAI session	• Do you have any **goals** in mind when you start the session? (*example, depending on the context*)
	 • Where is it:
	   1. Which institution?
	   2. Who organizes the session?
	   3. Where is it within the institution?
	 • Who is there?
	 • What do you do?
	 • What *do(es) the other(s) do*?
	 • What *does the dog do*?
	 • How long is a typical session?
	 • Is there a limit of sessions one child can take? Why is there a limit?
		Problem definition: Goals & Population characteristics
		
		 Key components: Space Timing
		
		 Critical inputs: Dog interaction Handler interaction
		
		 Parameters

Q. 5: What is a good CAI session?	• Think back to the description of the session. Which features of the session would you say are the most important its success? • Have you ever noticed who benefits the most from the sessions? (girls, boys?) How do you know? • Do you ask for feedback from the clients/the clients' parents/teachers?	**Output**

Appendix C: Final codebook

Theme/Code	Definition
Human-animal bond	**HAB is the prerequisite necessary for CAI to have effect. Do the practitioners mention HAB? What is HAB in their opinion?**
Population characteristics	**Who are CAIs for?**
Age	Age range
ESL student	Students, learning a second language (any language, not only English)
Gender	Male or female
Reluctant student	Students, who are not engaged in the learning process (distracted, doesn't like the subject)
Special needs	Students, with special educational needs (ADHD, autism, physical and psychological traumas etc.)
Stressed student	Anxious, homesick, sad, depressed students, stressed about their learning, but not necessarily struggling with it (it's not difficult for them to learn)
Struggling student	Students, who have no special needs, but are still struggling with their learning (shy, fearful, etc.)
Typical student	Normally developing students without difficulties in learning
Specific effective ingredients	
HOW	**A CAI session is a complex process of communication between a handler, a dog and a client or several clients. What about this interaction brings change to the clients?**
Dog interaction	Includes: presence of the dog, communication with the dog, touching|playing with the dog, gaze, looking at the dog, reading to a dog, etc.
Handler interaction	Includes all stages of a CAI session: before the session, during the session, afetr the session. How involved is the handler in the process in general? Do they feel they should interact with the clients? If yes, at which stages? At which not and why?
WHY	**What changes do CAIs produce in the participants?**
Mood	The mood of the participants changes to the better. Synonyms: state of mind, emotional state.
Motivation	Situational interest and engagement are bigger. Synonyms: it's cool, it's unusual More about **motivation**: *Motivation* is what drives a person to do something, so in my context: CAIs make the students **more interested**, **drive** them to perform the task.
Self-perception	Self-esteem, belief in one's worth, and self-efficacy, belief that one can cope with the task, are boosted. "being listened to and treated with respect validates a child and contributes to their self-esteem" "the opportunity to feel useful and competent, and help someone else understand, really contributes to the child's experience of validation and self-worth." R. E. A. D.
Self-regulation	Behaviour and emotional regulation (as compared to mood, emotional change doesn't happen on its own, but the client is able to change their emotions and behaviour, because the dog is present).
Social support	Dogs facilitate communication between humans or provide emotional social support. Emotional social support: "the offering of empathy, concern, affection, love, trust, acceptance, intimacy, encouragement, or caring".

Coping assistance/Distraction & relaxation	Dogs distract the participants from something unpleasant (or something percieved as unpleasant) and this leads to coping assitance - the stressors are percieved as less stressful and the task as more manageable.
Agency	"Student agency refers to learning through activities that are meaningful and relevant to learners, driven by their interests, and often self-initiated with appropriate guidance from teachers. To put it simply, student agency gives students voice and often, choice, in how they learn." More about **agency**: *Agency* is the ability to act, so in my context CAIs give the students **the ability to act** in a certain way (for example, choose whether they want to read or not).
Mechanisms and key components	**Apart from the dog-handler interaction, what in a CAI session is important?**
Timing	What time is sufficient?
Mode of delivery	How many dogs, students and handlers are present duringthe interventions? Is there anyone else present?
Breed or Size	What breeds/sizes of dogs are used?
Space	What kind of space should the CAI be held in and why?
Extra	Are there any extra things that can be done to make CAIs more effective?
Teacher	Only if the mode of delivery is **a diamond:** what does the teacher do with the CAI, apart from sending the students to it? **For triangle model:** how do teachers support each other?
Output	**What is the most important result of the CAI? What is the measurement of the result? In other words, how do the handlers know if the goals have been achieved?**
Handler motivation and goals	**Why did the handlers choose to practice CAIs?**
Motivation: A package	A unique combinaton of the hander's skills/interests, wish to do good for the people and the love of dogs. The handler wanted to do animal-assisted work for a long time, or wanted to do voluntary work for a long time and at some point realised that she has all ingredients to do CAIs.
Motivation: Coincedence	Some coincedence happened: the handler wasn't really thinking of doing canine-assisted or voluntary work or doesn't mention the dog as part of their motivation without a prompt from the interviewer.
Goals	Handlers' personal goals for participating in CAIs
CAI and dogs	**What are CAIs for dogs?**
Work	CAIs for dogs is the same thing as work for humans.
Hobby	CAIs for dogs is just a hobby.
Dog well-being	**The handler's concerns and opinions about the dog's well-being.**
Training	**The handler's training and their thoughts about it.**
FKC (Finnish Kennel Club)	
R. E. A. D.	
K. K. K. T.	

Appendix D: Final composition of elements of a *small theory*, research questions and themes

Element	Description (Kazdin 2017, p. 157; Leviton & Lipsey, 2007, p. 36)	Research question(s)	Theme(s)
Problem definition	What is treated? In which populations?	o What do CAIs in education aim to improve? For whom are they the most beneficial?	o Handlers' motivations and goals o Population characteristics
Critical inputs	How and why the treatment will affect the problem?	o What are the critical elements of the treatment? (e.g. mere presence of the dog; interaction with the dog or the amount of this interaction ;the bond/relationship with the dog; responses/reaction of the dog to the participant; participant's relation to the dog) o What is the role of the handler? o What are the supposed mechanisms that bring about change?	o Human-animal bond o Dog interaction o Handler interaction o Underlying mechanisms
Parameters of the treatment	Timing, space, mode of delivery	o How many sessions are needed and of what length? o What kind of space should the sessions be held in? o Who else is participating in the CAI?	o Key components o Dog well-being o CAI and dogs
Outcome	What is seen as evidence?	o After the intervention, what is seen as evidence and how is this assessed?	o Output

Appendix E:

Dear [*Name of the Participant*],

[*a couple of opening lines*]
I'm writing to say thank you for participating in my Master's thesis project about canine-assisted interventions in Finland. I have finished writing the first draft report of the findings now and would like to share it with you for your feedback!
If you wish to give feedback, follow these simple steps:
1. Read the attached PDF document
NOTE: It consists of roughly 15 pages of writing. I understand it can be too much to ask you to read everything as you have other business to attend to. That is why there are two alternatives:
- read the whole document OR
- read only the quotes and pages 13-15 - this is where the result of the findings are summarized.
2. Answer the two questions below
- In your opinion, do the findings represent your view of the reality of CAI in education in Finland?
- (if you recognize yourself from the quotes) Do you feel comfortable with me using these quotes to illustrate the findings? If not, how can I change them to ensure your comfort?
3. Send your answer to me, if you wish to answer in writing form **OR** if you wish to give feedback personally, **we can arrange a Skype/ZOOM call**.

If you do not wish to give feedback for whatever reason, it is your right to do so! However, in this case, please, inform me kindly that there will be no feedback from you.

[*a couple of closing lines*]

Best regards,
Marina