

# **Child-animal companionship and its impact on development of social behaviour during early childhood**

Mareike Weihrauch

Submitted in partial fulfilment of the requirements of  
the Bachelor of Arts degree (Psychology Specialization)  
at DBS School of Arts, Dublin.

Supervisor: Dr. Jonathan Murphy

Head of Department: Sinead Eccles

March 2012

Dublin Business School

DBS School of Arts

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## **Acknowledgments**

I would like to offer my deepest gratitude to Dr. Jonathan Murphy, my supervisor who provided greatly appreciated guidance and assistance throughout this study. Thank you for the ideas, advice and criticism you gave to me.

I would also like to thank Margaret Walsh for her kindness and constant reassurance.

The support of Dr. Pauline Cummins and Dr. John Hyland during my whole experience in DBS was unrivalled and will not be forgotten.

Furthermore, I would like to thank all my participants who took the time to participate in my study and filled out the questionnaires and want to thank the kindergartens in Germany who cooperated with me.

**Abstract**

Based on Levinson's observation this study is interested in the early child-animal interaction and its influence on Social Behaviour. For the purpose of the study 185 parents (n = 109 with pet ownership, n = 76 without pet ownership) from kindergarten in Germany were asked to fill out the Social Behaviour Questionnaire, evaluating their child's social behaviour. Statistically significant differences were found between Prosocial Behaviour of children with pet ownership (M = 13.393, SD = 3.406) and children without pet ownership (M = 10.474, SD = 3.840),  $t(181) = 5.417$ ,  $p < .001$ , 2-tailed. Further analyses found statistically significant differences on Social Behaviour in relation to gender and animal ownership, between siblings and animals, and between the different species of animals.

*Keywords:* child-animal interaction, Prosocial Behaviour, Problematic Behaviour

## **1. INTRODUCTION**

This study highlights that human-animal bond attention is primarily focused on the effect a companion animal has on the child. For this reason, the study explores the influence of animals on the social behaviour of the child. Walsh (2009) stated that even though various researchers have been supporting the valuable connection between animals and humans and its benefits, the field of psychology “has been slow in recognizing the importance of these bonds” (Walsh, 2009, p.1). This extends to the importance of animals in the educational setting such as in kindergartens, schools or even at home, where people may not be aware of the beneficial aspects of animals. The results of this research will, it is hoped, add to the understanding of the influence of animals on the behaviour of children, especially in younger years, for instance in their play years. If there is a significant difference in the social behaviours between pet owners and non-pet owners, kindergartens could consider involving animals in their programmes.

### **1.1. The History of the Human-Animal Bond**

The human-animal-bond has existed for a long time and allows an insight into the early history of the importance of animals in the life of humans. Kraft and Kraft (as cited in Mörbe, 1999) state that the relationship between humans and animals was originally based on a vital dependency, with humans relying on animals as provider for nutrition and clothes. With the domestication of various kinds of animals new dimensions for the human animal interactions have evolved. Dogs especially have gained an important role in the life of many humans. The dog has come to be appreciated for guarding the house and helping with tasks such as hunting. Due to the industrial development of society, humans constantly develop away from their prior natural environment and become disconnected from it. This increases the importance of animals for humans as a connecting partner for the human as isolation, alienation and being caught up in work place determined roles are often factors dictating the way of life for humans (Levinson, as cited in Mörbe, 1999; Rhein, as cited in Mörbe, 1999). But animals should not be seen as holding a solution to the problems or challenges people have to address and overcome in modern times. However they can form a new stability, reliability and responsibility in the balance between nature and the modern society (Birdger, as cited in Mörbe, 1999).

Mostly in capital cities there are restrictions that prevent people from being able to keep animals in their small apartments, either due to the small living size that would not coincide with the needs of the animal or often animals are simply forbidden. An animal can always, to various degrees, satisfy different necessities for human quality of life. These are constructs such as activity, optimism, relaxation, communication, personal health maintenance, self-affirmation, physical and psychological protection (Levinson & Mallon, 1997; Mörbe, 1999).

## **1.2. Animals in Therapy**

Over the years the role of the animal has expanded into the field of psychology, even though it was initially confronted with criticism and scepticism. Levinson, psychiatrist and child-psychologist, a pioneer in the field of psychotherapy with animals (Holz, 2006) discovered the potential “ice-breaking function” of an animal. Holz (2006) describes Levinson’s case from 1954, in which a boy who had been with various therapists but continued to withdraw reacted positively to the dog in the room at first sight. The dog was not supposed to be in the room, but because the parents showed up early, Levinson hadn’t removed his dog from his therapy room. The boy agreed to continue to come to the therapy with Levinson so long as the dog would be present. The dog became the mediator between the therapist and his patient enabling him to build trust and allow him to formulate a diagnosis and a therapy plan. In this manner Levinson initiated the area of animal-assisted therapy and stated that children should grow up with animals since it opens for them the idea of the needs of others (Holz, 2006).

Since this first case of animals in the psychological field more research and observations have found the unique interaction between an animal and a patient. Holz (2006) describes another case from the year 1975, also based on an “accidental discovery” such as already described in the case of Levinson’s observation, (Levinson & Mallon, 1997), the Psychologists Sam and Elisabeth Corson were able to observe the therapeutic influence of dogs. They were able to observe the ice-breaking function of dogs in relation to adolescents who had not spoken a single word since they had arrived at the clinic. Drawn by the barking of dogs, adolescents went to the kennel and asked if they could feed, take a walk with or play with the dogs. Based on this observation the Psychologists decided to undertake a pilot study to verify the effectiveness of animal-assisted psychotherapy. They chose patients which prior

to this did not respond to any other form of therapy. The result of their experiment suggested that 94% of the patients showed signs of their conditions improving.

Based on these experiences and observations by Psychologists, animals started gaining importance in the field of psychology. The “Wendelstein Klinik”, a hospital for neurology, psychiatry and psychosomatic disorders bases its therapy principles on Levinson’s observation of the healing effect of animals on humans as they describe in their booklet “Tier-Gestützte-Therapie” (Wendelstein Klinik, 2012). Animals involved in therapy do not just take the role of a social catalyst but also a cognitive one, meaning that animals can stimulate cognitive activity which is relevant for people in every age category. Furthermore it is suggested that animals increase responsiveness and alertness which can trigger increases with regard to interest in activities. Patients who have been in therapeutic interventions for a long time often get tired of repetitive therapies. It is suggested that the use of animals can overcome this symptom and motivate the patients to continue to work on themselves.

Based on the fact that animals are used as an intervention, in which the animals often go through specific training with a therapist to be qualified as a suitable candidate for animal-assisted therapy (Elpers, 2011), it is suggested that animals in normal everyday life can have great importance on the development of a person. Even though humans develop throughout their life, great importance is based on their early experiences and influences determining development and behaviour in later life. This is one reason why this study focuses on children and their social behaviour.

### **1.3. Children and Animals**

The influence of animals in children’s lives, where it is either direct contact with living creatures or mental representations included in play or learning materials, is an ever present element of childhood. Through the media children are confronted with characters such as “Benjamin Blümchen” or “Curious George” (Melson & Fine, 2006). These symbolic animals reflect the assumption that animals and children have a natural connection, which has been supported through various studies. Carlsson, Samuelsson, Soponyai and Wen (2001) studied ninety-three children of six to seven years from different cultures including China, Hungary and Sweden. Each child was asked to tell a story about a dog, by doing this they got an insight into how children made up stories within the different cultures. As an example Chinese children centred their attention on play and co-operation, where Hungarian children

focused on conflicts and the exchange of commodities. Valkenburg and Soeters (as cited in Melson & Fine 2006) stated that children show a great interest regarding animals; they based their theory on their research with Dutch children in the age range of eight to thirteen. The result was that “seeking information about animals” was one of the four most common descriptions of positive experiences with the Internet.

Bronfenbrenner (1986) emphasizes that the context of development is crucial for the individual since it provides the child’s potential network. Studies have shown that children especially turn to animals for encouragement and emotional support when experiencing stress. Covert, Whiren, Keith and Nelson (1985) studied pre-adolescents and adolescents in the age of ten to fourteen years from Michigan. They found that when the participants were upset, 75% turned to their pets. Further research has been done by Harlow (as cited in Levinson and Mallon, 1997) investigating the phenomenon of comfort contact. The research looked at orphaned monkeys and found that a mother replication made out of cloth was used by the monkeys for comfort even though a wire replication of a mother fulfilled their nutritional needs. Transferred to humans, the finding supports the importance of an animal in the life of a child to turn to when not feeling well and needing emotional support. In this case the animal acts as an agent of comfort. Looking at the current development of Irish society as an example for the change of Western Societies, Greene and Moane (2000) state that the number of children living with one parent has increased based on a higher rate of out-of-wedlock births (from 9.6% babies born to a single woman in 1986 to over 28% in 1998) and the increasing levels of marriage breakdowns. In this relation animals are sometimes used as an affective bond, present twenty-four hours a day for the child attempting to fill the gap left by a missing parent, when living with one parent, or busy parents (Melson & Fine, 2006).

During their development children have to master different tasks to become individuals who are able to be part of society and have a sense of self, which emerges through relationships with others (Alper, 1993). Melson (2001) expended this “other” to the relationship between children and animals. Erikson (1980) underlines the importance by stating that a child has to move away from the dual relationship with the mother to establish an identity. Levinson and Mallon (1997) highlighted the aspect of identity, stating that the identification with the animal is crucial for building a stable bond as well as for the development of the child. They elaborate on the child’s belief that the animal will get lonely or angry, and relates to the child’s parents the same way the child does. Furthermore the animal aids the child in forming a sense of self by providing consistent recognition and



appreciation (Alper, 1993) so that like Bowlby (1980) suggested children can feel safe without the presence of their parents if they have a bond with an animal that offers them a sense of reassurance, calm and security.

Levinson (as cited in Siegel, 2004) and Ruth (1992) found that children who have trouble socializing with other humans find it easier to interact with an animal because animals are not judgemental and accept the child the way they are. This is extremely important in the work of people with disabilities, who mostly have a difficult position in society based on the deficits they have. These can often differentiate them from other people. An animal does not make a difference in its sympathy, if somebody comes to him with a face distorted by fire, with a tumour or marked by an accident (Otterstedt, 2001). Next to the feeling of acceptance and being able to trust there is the sensation of being needed and not just needing somebody else. Corsini (as cited in Siegel, 2004) described that just being able to help already allows a person to feel better about his or her life. So while a child experiences that the animal needs him or her to survive by getting fed, cleaned or taken for a walk, the child feels better about him- or herself and might behave differently when in contact with peers than other children who did not have that same experience.

The different species of animals have different impacts on humans. Dogs have been found to have the greatest beneficial impact on individuals since they are able to show direct reactions to peoples actions and emotional states (Alper, 1993). Based on Harlow's theory of contact comfort, the fur of a dog or cat offers more comfort than a goldfish or turtle. But also turtles, gerbils, snakes, or hermit crabs have been found to have a soothing and calming effect even though they are not really able to actively respond (King, as cited in Alper, 1993). A study done by Beck suggests that Alzheimer patients when watching fish during normal eating hours became fascinated, which increased the patients' appetite and weight gain. (PAWSitive InterAction, 2002). Animals can teach the child various things like differentiating between affects, acquiring skills by modelling, empathy, responsibility, trust, identity, nurturing and which behaviours are accepted (Levinson as cited in Gee, 2010; Melson, 2007; Rud & Beck, 2000; Siegel, 2004). The aspect of nurturing plays an important role in the development of male children, since in most cultures it has not been, and probably still is not seen as a typical trait for a boy. By giving the boy a pet to care for, the boy can learn and act out the nurturing aspect which is suggested to have a great influence on his social behaviour (Daly & Morton, 2009; Grier, 1999).

A lot of the help an animal gives to a child could be compared with the modelling and help an older sibling is able to give to a younger sibling. According to Vygotsky's theory, The Zone of Proximal Development, the animal might take the role of an older sibling. Furthermore looking at the nurturing aspect of a child towards its pet is equal to the nurturing behaviour towards a younger sibling (Vygotsky & Kozulin, 2011). The comparisons of animal acting as a human in this manner have been made in various studies. Cain (as cited in Melson and Fine, 2006) reports that it can happen during the process of triangling, which occurs when two family members transfer intense interpersonal emotions onto another family member (e.g. father might yell at the dog when he was angry with his wife). Wells and Perrine (as cited in Walsh, 2009) add further support stating that 95 % of pet owners regard their animals as friends and /or family members (87%).

At the age of three a child starts to actively interact with the pet where the animal is represented more as a toy and less as an equal creature, even though it is able to teach the child acceptable behaviours by signalling the child how far he/she is allowed to go with his/her behaviour/actions. Reaching the age of five, children's primary interest is the social contact with other children (Guttmann, Predovic & Zemanek, 1985) whereby the animal can be helpful and function as a transitional object (Robin & ten Bensel, 1985).

#### **1.4. Social Skills and Behaviour**

Social Behaviour can be defined as any behaviour caused by another individual/group or a behaviour that is affected by an individual/group occurring in a social setting (at least one other individual, mostly another human being, is present) (Baron, Branscombe & Byrne, 2009). This highlights that social behaviour is close if not almost identical to social interaction. Depending on the age, culture, society and other variables slightly different standards and expectations are formulated. Sterry et al. (2010) looked at children in the age range of 8 to 16 when trying to highlight a link between temperament and peer acceptance with social behaviour functioning as a mediator. To obtain information about the social behaviour of their participants they used Revised Class Play identifying four factors determining the social behaviour for the focused age group, leadership/popular (e.g. amount of friends or quality of leadership), Prosocial (e.g. playing fair, helping other people), aggress/disruptive (e.g. fighting with or teasing other children) and sensitive/isolated (e.g. left out, difficulties in finding friends).

Further research suggests that social information processing is the base for aggressive behaviour. To be able to react with the appropriate behaviour a child has to go through five stages of decision making: encoding social cues, interpretation of social cues, response search, response evaluation and enactment. This process defines an individual's social skills and determines how the child reacts in different situations. A deficit in any of these areas can increase the chance of the occurrence of inappropriate social behaviour to a specific event, like Aggression (Dodge & Crick, 1990). It is suggested that according to the progression of information processing the reaction to social situations depends on past direct experiences (Burks, Laird, Dodge, Pettit & Bates, 1999) as well as on observations (Bandura, 1999). These experiences do not only have to be limited to inter human interaction, they could be applicable to human animal interaction through which the child learns how to read social cues. Reading the body language of animals is suggested to give the child a first insight in the Theory of Mind and might increase the child's ability to decode body gestures. On the other hand it is criticised on the basis that the difference between human body language and animal body language may make it harder for children to read the gestures of humans, because they rely too heavily on the cues they have learnt during the interaction with their pet (Alper, 1993). According to the social information approach the child needs to be able to go through the five stages successfully to show Prosocial Behaviour and not display deviant social behaviours. Owens (1995) investigated two of the subcategories of Problematic Social Behaviours, direct aggression and indirect aggression, and concluded that there are gender and developmental differences in relation to the prevalence of direct aggression and indirect aggression amongst children in school in the age range of 2 to 11.

This underlines the fact that social behaviour is functioning as an umbrella term and inherits various subcategories. For the current study social behaviour is split into Prosocial Behaviour and the Sum of Problematic Social Behaviour. In general Prosocial Behaviour can be explained in terms of actions/behaviours that help others with no immediate benefit to the acting/helping person (Baron, Branscombe & Byrne, 2009). When looking at 3 to 6 year old children it should not be expected to occur at a similar level to 12 year old children based on their social understanding, due to the exposure and experience in/with the social context and their cognitive development. Problematic Social Behaviour describes any social behaviour which can have negative effects on the acting individual (e.g. isolation, anxiety, and aggression).

### **1.5. The Psychosocial Development during Play Years**

During the stage of play years, the most dominant psychosocial accomplishment children learn is emotional regulation, which is defined as the capacity to control when and how emotions are used. The importance of understanding nonverbal behaviours such as emotional expressions can on the one hand help the children to protect themselves. On the other hand in a group setting this ability aids the child in refining his/her relationships with others by being able to provide support or comfort when detecting hidden sadness or fear. On the other hand the detection of anger can help the child to not get into confrontations and select the right behaviour to prevent escalation (Gosselin, Perron, Legault & Campanella, 2002). Infants as young as 8 months are already able to distinguish between positive and negative emotions in the facial expressions of their caregivers (Hertenstein & Campos, 2004). After reaching the age of 2 years the facial expressions are given meaning and are associated with verbal labels for a variety of emotions such as happiness, sadness and anger (Widen & Russell, 2008).

Two year old children are still very dependent and cling to a caregiver even though they show levels of self awareness. By the age of six years children become more independent and have developed a self understanding enabling them to function in a social context (Berger, 2008). According to Erikson's (1980) stages of the psychosocial development children in this age are confronted with the task of initiative versus guilt. The children try new things and depending on the outcome and the response they get from their parents they develop a feeling of pride or guilt which then has an affect on their self-esteem. The self-esteem children develop from their experiences determines the level of belief they have in their own abilities. By building up self-esteem the children come to develop confidence and independence.

If a child grows up with an animal it learns, via observation, how to take care of the animals. During their development they learn how to pet or pick up an animal without hurting it and how to care for an animal in relation to regular feeding and cleaning. When the parents give positive feedback to the child it develops the feeling "I can take care of the pet" and possibly develops a feeling of responsibility and pride regarding mastery of this ability. In this process children are able to form a self-concept, including self-esteem but also gender and size (Berger, 2008). Furthermore during this age range children are moving from Piaget's defined egocentrism to understanding the world from other people's perspective while they increase their social awareness. At the same time two important emotions arise: empathy and

antipathy. Empathy describes the ability to understand the emotions of others even if they are different from their own emotion. Antipathy is defined as the emotions of anger, disgust, dislike, or hatred towards another person. Research suggests that animals can help children to develop empathy (Melson, 2001) which is crucial because it is suggested that deficits in empathy are linked to antisocial behaviour (Warden & Mackinnon, as cited in Taylor & Signal, 2005). Additionally Ascione (2001) suggests that animal-directed empathy might translate into empathy directed towards humans. Furthermore Thompson and Gullone (2003) report that in ideal cases the development of empathy can lead to the development of Prosocial Behaviours in children.

According to Social Learning Theory as proposed by Bandura, children are able to learn social rules as well as how to behave in a social context. This comes about by the leading component of this concept called modelling, which describes how the child watches other people's behaviour. As a result they can imitate behaviours like aggression, sharing, cooperation and social interaction. Further research showed that the process of observational learning is composed of three stages: the experience to the response of others, the understanding of another individual's viewpoint and the acceptance of the modelled act for one's own behaviour (Bee & Boyd, 2003). Social development during the play years is mainly governed by the microsystem available to the child (Bronfenbrenner, 1986). For children up until 3 years the social interaction and observational learning is governed by members of the family including the interaction with pets. From there on social interaction increases and the majority of children enter day care or kindergarten where they are exposed to peers and teachers outside of their direct context (Bee & Boyed, 2002).

Play acts as a mediator between children in their play years and aids as a bridge when building their first social contacts. Parten (1933) describes in his observational study that the amount of children playing in a group increases with the age of children. When analysing the play of the children in the age range from 2 years to 4.5 years, she defined six stages of play a child moves through: unoccupied (standing on one spot and performing random movements), solitary (playing alone), onlooker (expressing interest in each other by watching others play), parallel (2 or more children play together with toys and cooperate sometimes, but more often play side by side), associative (showing little interaction, most spontaneous and short lived, while carrying out own play activities), and cooperative play (starting around the age of 3 and 4, several children will work together to accomplish a goal) (Bee & Boyed, 2002; Parten, 1993).

Pellegrini and Smith (1998) elaborate that there are three different types of physical activity play a child anticipates in. They hypothesised that, during infancy peaking “rhythmic stereotypies” improves the control of particular motor patterns. From there the child increasingly makes use of exercise play which is thought to benefit strength endurance training and cognition. Especially the third type of play, rough-and-tumble play demonstrates a crucial part in the relation to the social skills of a child and is categorized as social play. Even though it has been seen as difficult to operationally define play (Smith & Vollstedt, 1985), social play can be explained in terms of a play that is directed towards others. Experimental work with rats looked at play fighting, which can be understood as the equivalent to human rough-and-tumble play. If an adult rat had been prevented from playing with its peers in the early stages of development, it displayed many emotional and cognitive deficits in its later social behaviours (Pellis & Pellis, 1987). In 2003 Gordon, Burke, Akil, Watson and Panksepp (as cited in Pellis & Pellis, 2007) described the underlying neurological mechanisms of rough-and-tumble play. Play fighting induces the release of chemical growth factors in the brain areas which are activated during that process. This triggers the promotion of growth and development in these specific areas. It is suggested that the area involved in this act is the orbitofrontal cortex, which is responsible for social discrimination and decision making (Pellis & Pellis, 2006). When looking at gender differences within play, it is suggested that especially rough-and-tumble play is rougher in boys than girls.

Play has many benefits for children as it affects various areas of the child’s development. It shows advantages for the social behaviour of the child by teaching him/her cooperation, communication and social rules, as well as the Theory of Mind. On an emotional level play can be used to release tension, practice emotional control and build self-confidence. During play and the interaction with another child or probably even when playing alone, the child learns to solve problems, influencing the child’s behaviour on a cognitive level (Bee & Boyd, 2003; Berger, 2008). Additionally Ginsburg (2007) demonstrates that even though play is crucial for the child’s development is also serves the child-parent bond since it allows the parent to get a unique chance to see the world from their child’s point of view. This can increase the parents understanding of their child. The insight the parents gain can also improve the child parent communication.

Since play has been suggested to encompass such a crucial role in the development of a child it is hypothesized that this beneficial form of social learning does not only occur between humans (between peers or siblings), but can be extended to the child-animal

interaction in at least some aspects. In regard to rough-and-tumble play children enjoy, even in early stages, to engage in this practice with their dogs, in which the animal will give behavioural feedback on the child's actions indicating how far he/she is allowed to go. According to the comparison between siblings and animals, the way children interact with each other within a family could either influence the behaviour in the Prosocial direction (Vygotsky & Kozulin, 2011) or to the other end of the continuum towards Problematic Behaviours, in relation to aggressive behaviour (Zelkowitz, 1987). Berndt and Bulleit (1985) looked at the different potential influences of sibling types (older or younger siblings) and stated that children with younger siblings are expected to take the leadership role when interacting with peers as well as to display more Prosocial and Aggressive Behaviour.

### **1.6. The Study: Hypothesis and Aim**

Most studies and interventions with animals in the life of children are based on educational settings (Rud & Beck, 2000; Siegel, 2004) or in therapeutic conditions (Flynn, 2000; Schaefer, 2002) but it seems that barely any research has been done in relation to the early childhood development, like children in the age range from three to six visiting kindergartens (the equivalent of play school for children in the age range 2 to 6). This study tries to assess if there is already an effect of companion pets on younger children's social behaviour. A statistical comparison of 2010 shows that Germany has one of the lowest percentages for households owning at least one cat or dog than other European countries (FEDIAF, 2010).

Mörbe (1999) explains that sometimes families are unable to hold an animal in their home based on environmental and economic limitations. This underlines the importance of various interventions in the environment of a child for example in the form of integrating animals in the education system. Rud and Beck (2000) conducted a survey study in elementary schools in Indiana, whereby 26.6% of the teachers who replied had an animal in their classroom. Fish were reported to be the most present animal in a classroom (27.5%) because they are easy to observe and care for and have only minimal distracting qualities. But also mammals (26.3%) and reptiles/amphibians (22.1%) were prioritised animals in classrooms. The teacher reported that the animals were especially used as being studied as an academic subject (31%) and as a creativity factor for writing and drawing assignments (27%). Less frequent were animals cared for by the students (13%) or used for calming the students

down. Only 22.1 % of the teachers saw the role of the animal as related to the psychological well-being of their students. As reported by Siegel (2004) animals teach children a great variety of things and can be used in the educational setting for different factors, like trust and social skills.

Based on previous research this study specifically investigates the differences in social behaviour between German children in their play years (between 3 and 6 years). The children are from a city and the rural area around it in the Northwest of Germany. All the children assessed are from kindergartens in that area. The parents were asked to fill out the translated version of the Social Behaviour Questionnaire (SBQ) developed by Richard Trembly in 1992 (as cited in Lösel, Beelmann & Stemmler, 2002). To decrease the aspect of subjectivity, both parents were asked to separately fill out the questionnaire about their child. Additionally this study accounts for possible confounding variables like siblings and gives the parents the opportunity to qualitatively state any experiences or life events which might have had an important impact on the child.

Based on the previous research it is hypothesised that children growing up with an animal at home will show significantly less problematic social behaviours than children growing up without animals. Based on the nurturing aspect in a human animal companionship it is hypothesised that animal companionship has a greater influence on male children in the age of three to six than on female children. Furthermore it is suggested that children who are growing up without an animal but older siblings and children growing up with an animal and without siblings score similar on the social behaviour questionnaire. Since studies suggest that different kind of animals can have various effects, it is hypothesised that the different species have different influences on the social behaviour during early childhood development, whereby the dog has significantly the greatest influence on the child's social behaviour by actively interacting with the child.



## 2. METHODOLOGY

### 2.1. Material:

This quasi experiment made use of a simple paper and pen questionnaire looking at the Social Behaviour for children of Kindergarten age. The Social Behaviour Questionnaire (SBQ) was originally developed by Tremblay in 1992 and consisted of 38 questions. Since then the questionnaire has been revised and has recently been translated into German by Lösel, Beelmann and Stemmler in 2002. They have also added one additional question (“He/She tortures animals”) so that the current German version of the SBQ (See Appendix Figure 1) consists of 48 items describing the behaviour patterns of children in their Play Years. The applied version is the SBQ-EL4-11, which has been composed for parents to assess their child’s behaviour as accurately and simply as possible. In addition to the Sum of Problematic Behaviours there are 6 primary scales which can be generated: Prosocial Behaviour, Hyperactivity, Physical Aggression, Delinquency, Indirect Aggression, and Emotional Disruption/Anxiety. According to the psychometric features for the SBQ the scales from the original 38 item questionnaire displays satisfactory test-retest reliability ranging from .62 to .76. Even though the age range is limited for 4 year olds to 11 year olds, it is advocated that it is also effective for describing social behaviour of 3 year old children (Lösel, Beelmann & Stemmler, 2002). No attention was given to the diagnostic capacity of the SBQ at any given time.

Each questionnaire package contained two identical versions of the SBQ, a consent form to explain the study, ask for the parents consent, guarantee anonymity and inform participants about their right to withdraw at any time (See Appendix Figure 2) and a short demographic questionnaire (See Appendix Figure 3) The demographic form gathers information regarding the age and gender of the child, and if they have siblings and if so whether they were older or younger siblings. Furthermore, it was asked if the child owned a pet and in case of having an animal at home it was requested to specify what kind of animal(s) and since when. In the event that the family had an animal less than one year, the children weren’t included into the study. A separate question was given to the parents to specify any important influences on the child’s development, which is briefly mentioned in the discussion.

## **2.2. Participants:**

A cluster sampling method was used to select kindergartens in an area of Emsland, in both rural and city regions. Each kindergarten got the opportunity to participate by volunteering at a chosen time during a time frame between July and December 2011. Each kindergarten director was asked personally if they would like to participate. In the end 8 kindergartens with families from various socio-economic backgrounds agreed to participate from different areas with various concepts about childcare practice. Overall, 185 participants were obtained, 58.9% (n = 109) of the families had animals at home, 45.9% (n = 50) were girls and 54.1% (n = 59) were male. 41.1% (n = 76) of the children did not have an animal at home, 48.7% (n = 37) were female and 51.3% (n = 39) were male children. The children's age range was limited to three to six year olds, with a mean age of 4.13 years (SD = 0.984).

## **2.3. Design:**

The study is a cross-sectional between-groups quasi-experimental design looking at the social behaviour of children in kindergarten in the age range of 3 to 6 years old. The main independent variable (IV) was pet ownership distributed into 2 groups: "yes" (pet at home) and "no" (pet at home). Within this main IV different categories were established looking at a spectrum of animal species. The between-subjects variable "Kind of Animal" was categorized into 4 categories: Group 1: dog, Group 2: cat, Group 3: both (dog and cat), Group 4: small animals (rodents, birds, water animals, and other). Since siblings were thought to be a confounding variable it is controlled by using it as an additional IV. The dependent variables (DV) are the total scores of the different scales of the questionnaire. The main dependent variables are the cumulated scores for the Sum of Problematic Behaviours as well as Prosocial Behaviour. For this study the calculated scale of Sum of Problematic Behaviours consists out of five uncategorized items from the questionnaire and five subscales: Hyperactivity, Physical Aggression, Delinquency, Indirect Aggression, and Emotional Disruption/Anxiety.

## **2.4. Procedure:**

Before handing out the SBQ, various possible surveys were discussed with different psychologists working with children in various settings including kindergarten, child and

adolescent psychiatric facilities and other educational institutions. The SBQ was distributed by the kindergarten teacher to the parents and to ensure complete anonymity the parents were able to drop it into a box or if desired to hand it back to the kindergarten teacher. The parents had a time frame of two weeks to return the questionnaire, enabling the parents to take a close look at the behaviours in question. The time necessary to fill out the questionnaire was calculated as approximately 12 minutes. Based on the issue of subjectivity, the participating parents both the Mothers and Fathers were asked to each fill out a questionnaire independently from each other. In the case of a single parent, grandparents, partners, relatives or older siblings were asked to fill out the second questionnaire. Contact addresses were given out so that any additional questions and concerns could be addressed. To reduce the stress level for the parents, the data collecting process started in July 2011 and finished in December 2011, as each kindergarten was able to specify this time range as being the least stressful for their parents to fill out the questionnaire and no other data sampling had occurred in close temporal relation to this study.

## **2.5. Statistical Analysis:**

The statistical programme SPSS18.0 was used for analysing the collected data and Microsoft Office Excel 2007 was used for building graphs and tables.

*Hypothesis 1:* To test for significant differences in the Social Behaviour of children in the age range of 3 to 6 growing up with animals in contrast to children in their play years growing up without pets, two independent samples t-tests were conducted.

*Hypothesis 2:* For comparing the influence of animals on boys in relation to the effect of animals on girls, two-way between-groups analysis of variance (2x2 ANOVA) was conducted as well as a mixed between-within subjects analysis of variance (mixed design ANOVA).

*Hypothesis 3:* A one-way between-groups analysis of variances (one-way ANOVA) and independent samples t-tests were designed to investigate the effect of siblings in relation to pet ownership on the child's Social Behaviour. Furthermore 4x2 between-groups analyses of variances (4x2 ANOVA) were conducted to explore the influence of sibling type and animal ownership on Social Behaviour (Prosocial Behaviour, Problematic Social Behaviour). The sibling constellation (Sibling) is one of the IVs existing of 4 levels of sibling types

(Group 1: no siblings, Group 2: older siblings, Group 3: younger siblings, Group 4: both/older and younger siblings) and animal ownership the other IV is nominally categorised as “yes” (having an animal) and “no” (not having an animal).

*Hypothesis 4:* One-way between-groups analysis of variance (one-way ANOVA) was performed to identify differences in the Social Behaviour (Prosocial Behaviour and the Sum of Problematic Behaviour) of children in relation to what kind of animal they are interacting with, whereby the IV was arranged into the four categories.

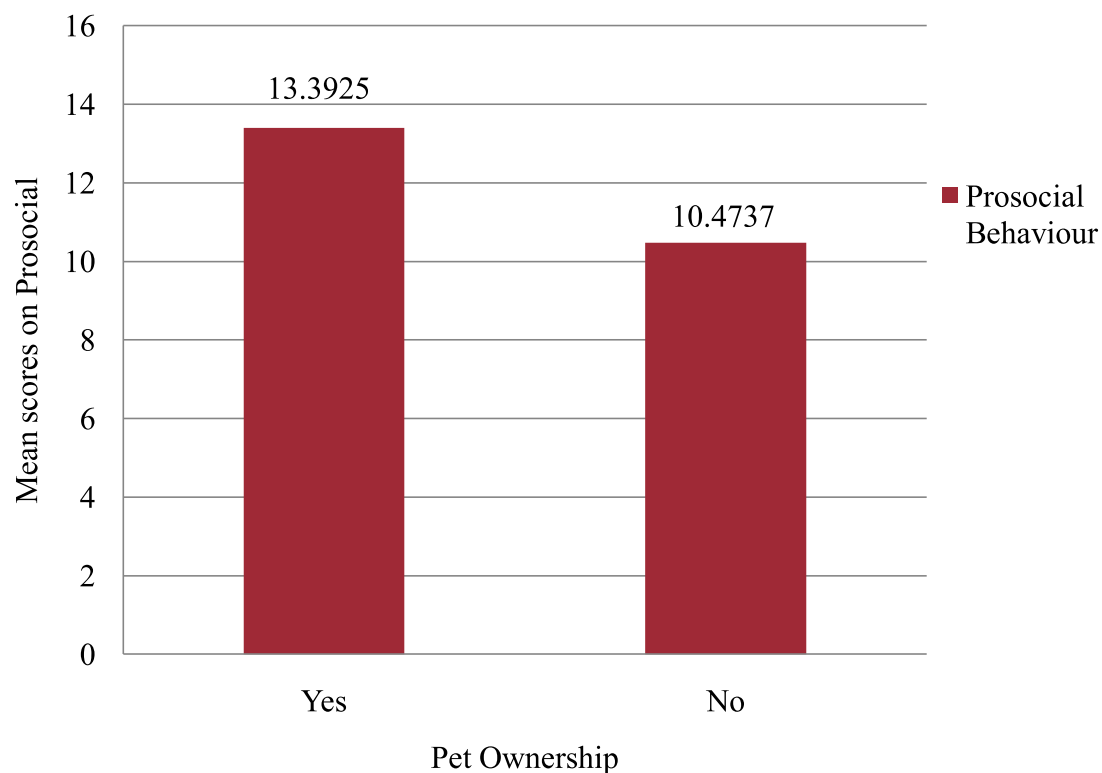
### 3. RESULT:

Inferential statistics were used to explore the contribution of participants for the different groups, as well as to get the means and standard deviation for the depending variables (scales of the SBQ) (See Appendix Table 1).

#### 3.1. First Hypothesis

The first hypothesis is looking at the differences in Social Behaviour between children who are growing up with an animal and children growing up without an animal.

An independent samples t-test found that there was a statistically significant difference between Prosocial Behaviour of children with animals and children without animals ( $t(181) = 5.417, p < .001, 2\text{-tailed}$ ). Children growing up with animals at home were found to have higher scores on Prosocial Behaviour ( $M = 13.393, SD = 3.406$ ) than children having no animals at home ( $M = 10.474, SD = 3.840$ ) (Figure 1). The magnitude of the differences in the means (mean difference = 2.919, 95% CI: 1.856 – 3.982) was quite large (eta squared = .123) (Figure 1).



**Figure 1.** *Bar chart illustrating the mean scores for Prosocial Behaviour for children with animals at home and children without animals at home.*

No significant difference was found between the Problematic Behaviour between children with animals and children without animals.

### 3.2. Second Hypothesis

It is hypothesised that the effect of animals on social behaviour is greater on male children than on female children.

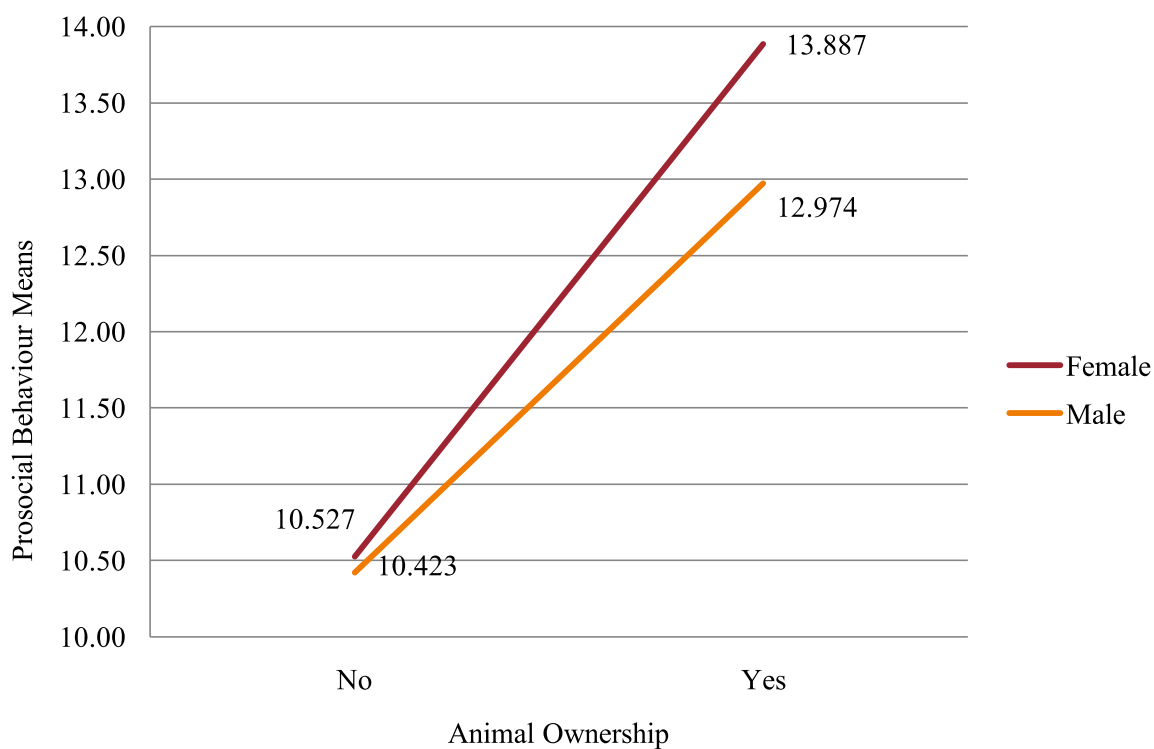
A 2x2 between-groups ANOVA was performed to explore the impact of gender and pet ownership on Prosocial Behaviour and the Sum of Problematic Behaviour. The children were categorized either as owning an animal or not. The interaction effect between gender and pet ownership was not statistically significant, neither for Prosocial Behaviour,  $F(1, 179) = 0.562, p = .455$ , nor for Problematic Behaviour,  $F(1, 174) = 0.272, p = .602$ . A significant main effect for animal pet ownership was found on Prosocial Behaviour,  $F(1, 179) = 29.945, p < .001$ ; however, the effect size was relatively small (partial eta squared = 0.143). Furthermore, a significant main effect was discovered for gender on Problematic Behaviour,  $F(1, 174) = 11.786, p = .001$ , with a small effect size (partial eta squared = 0.063).

Post hoc independent samples t-tests were conducted to explore statistically significant differences between female participants (Female) with pet ownership (Yes) and female participants without pet ownership (No) (Table 2.1., Figure 2.1a.). Furthermore post hoc independent samples t-tests were performed to investigate statistically significant differences between male participants (Male) with pet ownership and male participants without animals at home (Table 2.1., Figure 2.1b.).

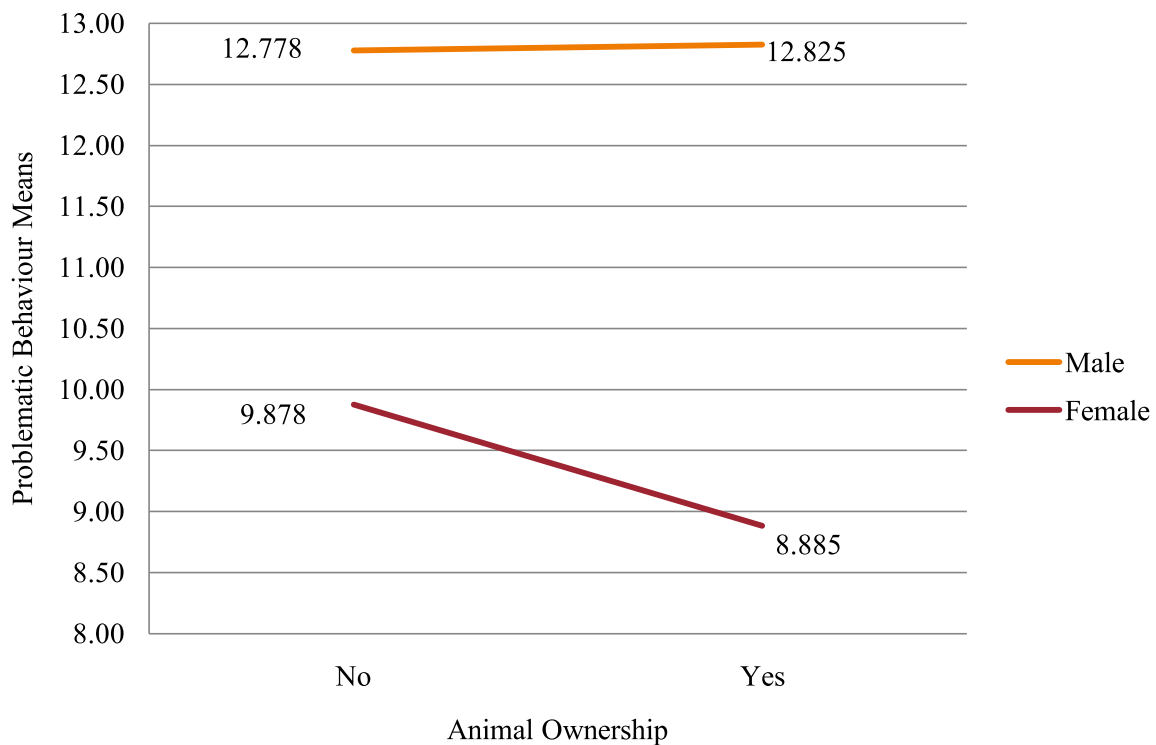
**Table 2.1.** Table for the post-hoc independent sample t-test showing the scores for male and female participants.

Variables		Mean	SD	t	df	p-value	95% CI	Eta-squared
<b>Prosocial (Female)</b>	Yes	13.887	3.419	4.213	84	.000*	1.774 to 4.947	.174
	No	10.527	3.965					
<b>Problematic (Female)</b>	Yes	8.885	5.288	-0.842	83	.402	-3.338 to 1.352	.008
	No	9.878	5.519					
<b>Prosocial (Male)</b>	Yes	12.974	3.367	3.487	95	.001*	1.099 to 4.004	.113
	No	10.423	3.769					
<b>Problematic (Male)</b>	Yes	12.825	7.796	0.030	91	.976	-3.087 to 3.180	.000
	No	12.778	6.750					

Note: \*significant at 0.05 level, 2-tailed



**Figure 2.1a.** Line Graph showing the mean scores for Prosocial Behaviour for male participants with/without animals and female participants with/without animals.



**Figure 2.1b.** Line Graph showing the mean scores for Prosocial Behaviour for male participants with/without animals and female participants with/without animals.

A mixed design ANOVA was conducted to assess the impact of two different independent variables (gender of the child and pet ownership) on children's scores on types of Problematic Social Behaviour (Hyperactivity/Inattentive, Physical Aggression, Destruction/Delinquents, Indirect Aggression and Emotional Disturbance), as measured by the Social Behaviour Questionnaire (SBQ). The interaction effect between gender and pet ownership for Problematic Social Behaviour was not significant, Wilks' Lambda = 0.961,  $F(4, 171) = 1.722$ ,  $p = .147$ , partial eta squared = 0.039. But there was a substantial main effect for gender on Problematic Social Behaviour, Wilks' Lambda = 0.854,  $F(4, 171) = 7.292$ ,  $p < .001$ , partial eta squared = 0.146.

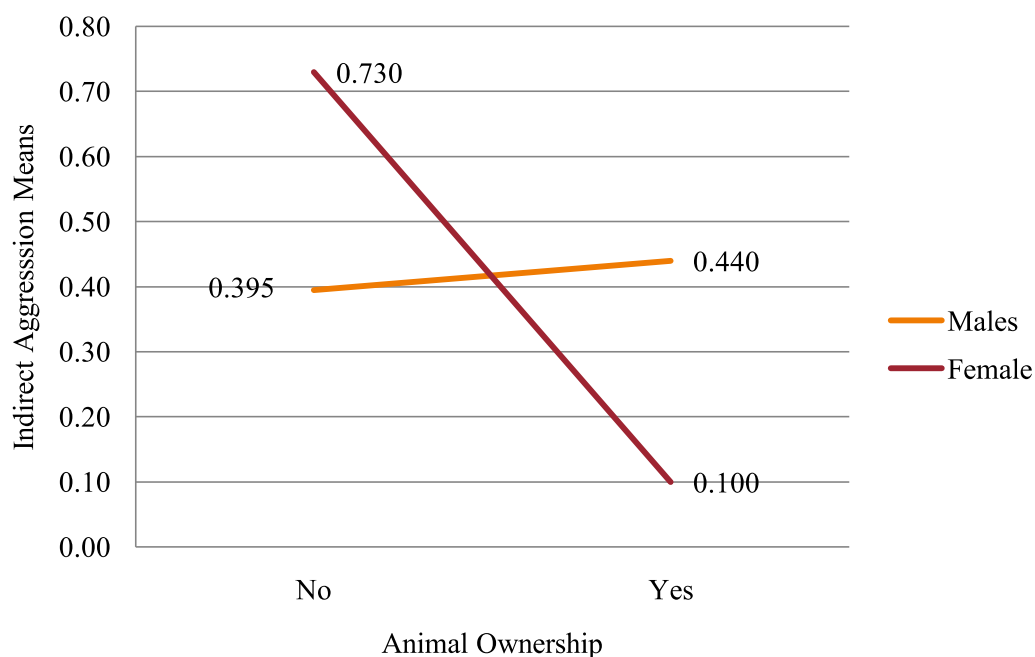
Post hoc independent samples t-tests explored statistically significant differences between female children owning a pet and for female children who don't own a pet on the subscales of Problematic Social Behaviour (Table 2.2., Figure 2.2.).



**Table 2.2.** Table illustrating the post-hoc independent sample t-test showing the differences between female children with/without animal.

Variables		Mean	SD	t	df	p-value	95% CI	Eta-squared
<i>Hyperactivity/ Inattentive</i>	Yes	3.949	3.434	0.206	83.569	.837	-1.194 to 1.471	.000
	No	3.811	2.777					
<i>Physical Aggression</i>	Yes	0.820	0.973	2.021	84.807	.046*	0.006 to 0.741	.045
	No	0.446	0.753					
<i>Destruction/ Delinquents</i>	Yes	0.816	0.967	-0.604	84	.548	-0.615 to 0.328	.004
	No	0.960	1.232					
<i>Indirect Aggression</i>	Yes	0.100	0.286	-3.755	40.460	.001*	-0.969 to -0.291	.142
	No	0.730	0.990					
<i>Emotional Disturbance</i>	Yes	2.100	1.237	-1.648	65.346	.104	-1.153 to 0.111	0.031
	No	2.623	1.604					

Note: \*significant at 0.05 level, 2-tailed



**Figure 2.2.** Line graph showing the mean scores for Indirect Aggression for males and females with/without animals.

The post hoc independent samples t-test looked at significant differences between male participants with or without pet ownership in relation to the five subscales for the Sum of Problematic Behaviour (Table 2.3. Figure 2.2.).

**Table 2.3.** Table illustrating the post-hoc independent sample t-test showing the differences between male children with/without animal.

<b>Variables</b>		<b>Mean</b>	<b>SD</b>	<b>t</b>	<b>df</b>	<b>p-value</b>	<b>95% CI</b>	<b>Eta-squared</b>																																										
<b><i>Hyperactivity/ Inattentive</i></b>	Yes	5.661	4.118	0.622	95	.535	-1.102 to 2.108	.004																																										
	No	5.158	3.495						<b><i>Physical Aggression</i></b>	Yes	1.655	1.733	0.232	95	.817	-0.590 to 0.747	.000	No	1.577	1.451	<b><i>Destruction/ Delinquents</i></b>	Yes	1.153	1.172	-0.682	95	.497	-0.741 to 0.363	.005	No	1.342	1.453	<b><i>Indirect Aggression</i></b>	Yes	0.440	0.843	0.270	94	.788	-0.285 to 0.375	.000	No	0.395	0.718	<b><i>Emotional Disturbance</i></b>	Yes	2.297	1.436	0.006	96
<b><i>Physical Aggression</i></b>	Yes	1.655	1.733	0.232	95	.817	-0.590 to 0.747	.000																																										
	No	1.577	1.451						<b><i>Destruction/ Delinquents</i></b>	Yes	1.153	1.172	-0.682	95	.497	-0.741 to 0.363	.005	No	1.342	1.453	<b><i>Indirect Aggression</i></b>	Yes	0.440	0.843	0.270	94	.788	-0.285 to 0.375	.000	No	0.395	0.718	<b><i>Emotional Disturbance</i></b>	Yes	2.297	1.436	0.006	96	.996	-0.625 to 0.629	.000	No	2.295	1.665						
<b><i>Destruction/ Delinquents</i></b>	Yes	1.153	1.172	-0.682	95	.497	-0.741 to 0.363	.005																																										
	No	1.342	1.453						<b><i>Indirect Aggression</i></b>	Yes	0.440	0.843	0.270	94	.788	-0.285 to 0.375	.000	No	0.395	0.718	<b><i>Emotional Disturbance</i></b>	Yes	2.297	1.436	0.006	96	.996	-0.625 to 0.629	.000	No	2.295	1.665																		
<b><i>Indirect Aggression</i></b>	Yes	0.440	0.843	0.270	94	.788	-0.285 to 0.375	.000																																										
	No	0.395	0.718						<b><i>Emotional Disturbance</i></b>	Yes	2.297	1.436	0.006	96	.996	-0.625 to 0.629	.000	No	2.295	1.665																														
<b><i>Emotional Disturbance</i></b>	Yes	2.297	1.436	0.006	96	.996	-0.625 to 0.629	.000																																										
	No	2.295	1.665																																															

Note: \*significant at 0.05 level, 2-tailed

### 3.3. Third Hypothesis

Furthermore it is suggested that siblings have the same effect like animals on the social behaviour of children and therefore it is hypothesised that children with an animal but without a sibling and children without an animal but a sibling show similar scores on the SBQ.

A One-way ANOVA was conducted to investigate the impact of siblings on Prosocial Behaviour and the Sum of Problematic Behaviours. The children were divided into four groups in relation to their siblings (Group 1: No Siblings, Group 2: Older siblings, Group 3:

Younger Siblings, Groups 4: Both (older and younger) Siblings). There was no statistical significant difference at the  $p < 0.05$  level in Prosocial Behaviour scores ( $F(3,179) = 0.722, p = .540$ ) or the Sum of Problematic Behaviours ( $F(3, 174) = 0.523, p = .667$ ) for the four groups.

4x2 ANOVAs were conducted to investigate the influence of sibling type and animal ownership on Social Behaviour. The two DVs used were the Sum of Problematic Behaviours and Prosocial Behaviour as measured by the SBQ. The first IV was the four sibling types: Group 1: No Siblings, Group 2: Older Siblings, Group 3: Younger Siblings, Group 4: Both siblings. Animal was the variable assessing pet ownership and categorises participants according to if they possess any kind of animal. This was the second IV. Based on the nature of the IVs the ANOVA has multivariate characteristics. Interpreting first the results for Prosocial Behaviour the interaction effect between the types of sibling and pet ownership was not significant,  $F(3,169) = 0.340, p = .796$ . There was no statistically significant main effect for the type of sibling,  $F(3, 169) = 0.565, p = .639$ , but for pet ownership there was a statistically significant main effect,  $F(1, 169) = 18.809, p < .001$ . For the Sum of Problematic Behaviour neither a statistically significant interaction effect,  $F(3, 169) = 0.769, p = .513$ , nor any statistically significant main effects either for sibling type,  $F(3, 169) = 0.805, p = .639$ , or  $F(1, 169) = 0.350, p = .555$ .

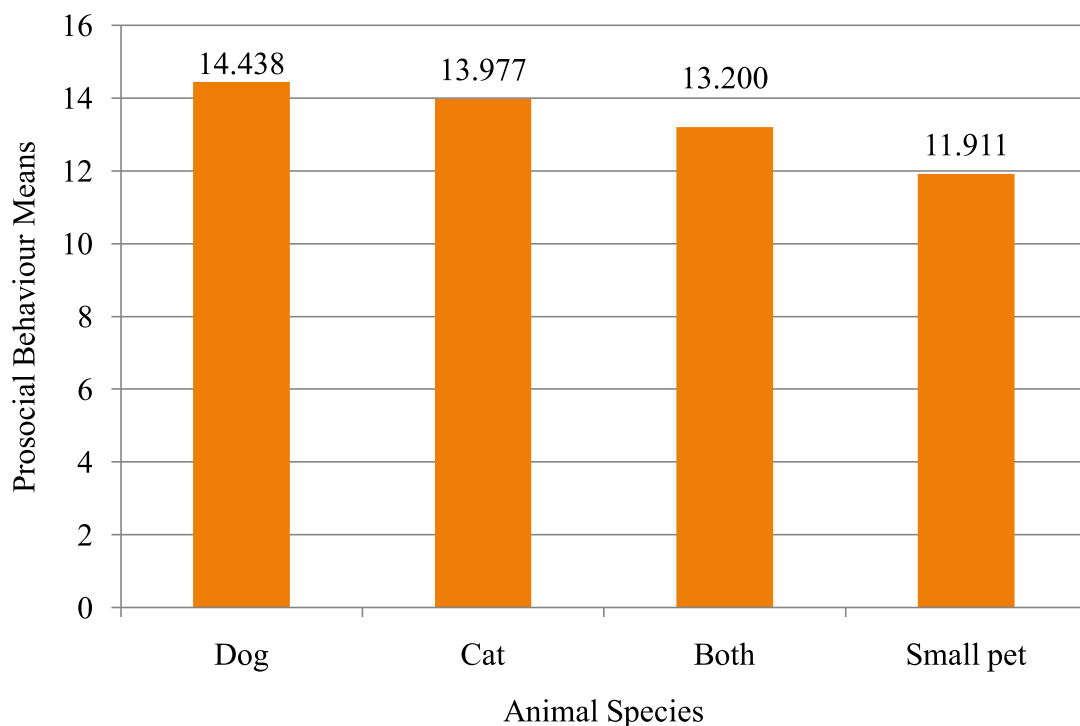
Significant differences between children with a pet but without a sibling and children without pets but siblings on Prosocial Behaviour have been found via an independent samples t-test,  $t(83) = 4.096, p < 0.001, 2$ -tailed. Children with an animal and without a sibling ( $M = 14.250, SD = 3.158$ ) have been shown to have higher degrees of Prosocial Behaviour than children without animals but siblings ( $M = 10.476, SD = 3.893$ ) with a 95% confidence interval ranging from 1.941 to 5.607. No significant differences were found between the two groups on the Sum of Problematic Behaviour ( $t(82) = 0.132, p = .895, 2$ -tailed).

For the different subscales of Problematic Behaviour (Hyperactivity/ Inattentive, Physical Aggression, Destruction/Delinquents, Indirect Aggression and Emotional Disturbance/ Anxiety) as well as the Sum of Problematic Behaviours several independent samples t-tests were conducted whereby only for Indirect Aggression significant differences between children with siblings but without pets and children without siblings but pets were found,  $t(75.57) = -2.943, p = .004, 2$ -tailed). Children without siblings but with a pet ( $M = 0.13, SD = 0.458$ ) display less Indirect Aggression than children without pets but siblings ( $M = 0.57, SD = 0.913$ ).

### 3.4. Fourth Hypothesis

Based on the direct contact some animals are able to give, it is suggested that the different animal species will show different effects on the social behaviour of children in their play years. A one-way ANOVA was performed to explore the impact of the different pet kinds on levels of Prosocial Behaviour and Sum of Problematic Behaviours. The children were divided into four groups according to their pet (Group 1: dogs, Group 2: cats, Group 3: both (dog and cats), Group 4: small animals (rodents, fish, birds and reptiles)) (Figure 3.).

There was a statistically significant difference at the  $p < 0.05$  level in Prosocial Behaviour scores for the four pet groups:  $F(3, 102) = 3.202, p = 0.026$ . Despite reaching statistical significance, the actual difference between the groups was quite small. The effect size, calculated using eta squared, was 0.09. Post-hoc comparisons using the Bonferroni test indicated that the mean scores for Group 1 ( $M = 14.438, SD = 3.071$ ) was significantly different from Group 4 ( $M = 11.911, SD = 3.702$ ). Group 2 ( $M = 13.977, SD = 3.702$ ) did not differ significantly from either Group 1, 3 or 4 (Figure 3.). Furthermore no significant differences were found between Group 3 ( $M = 11.911, SD = 3.702$ ) and Groups 1, 2 or 4.



**Figure 3.** Bar diagram showing the Prosocial Behaviour Means across the animal species.

## **4. DISCUSSION:**

This study investigates the effect of pet ownership on the Social Behaviour of children in their play years.

### **4.1. Prosocial Behaviour**

#### *4.1.1. First Hypothesis*

The main statement of this study is that animals have a statistically significant effect on the Social Behaviour of children. The tests conducted looked at the measured Prosocial Behaviour of children in their Play Years suggesting that especially Prosocial Behaviour is highly influenced by animal ownership. The results of the independent samples t-test show that the children have statistically significant higher scores. This corresponds with the current literature suggesting that animals, as social contact for the child, can teach the child different behaviours via modelling. Even though the children are in the beginning of their social development and just begin building up the cognitive ability to understand the view of others, the presence of pets seems to aid that development (Figure 4). It seems that already by the age of three, children display different levels of Prosocial Behaviours, even though they enter the new social environment in the same manner as children growing up without animals. The difference could be explained by the establishment of the self the child was able to develop by growing up with an animal (Alper, 1993) and therefore has an advantage by feeling comfortable and safe in the social interaction with other children. Furthermore the previously learnt trust in the animal and the learnt responsibility and empathy aid the child to build relationships to his/her new peers (Melson, 2007; Rud & Beck, 2000; Siegel, 2004). But the advantage seems to be a constant factor, indicating that based on the child-animal bond the child becomes continuously influenced and hence the children in the different age groups with an animal at home show higher levels of Prosocial Behaviour at every age than the children who are growing up without an animal.

#### *4.1.2. Second Hypothesis*

A 2x2 between-groups ANOVA which was conducted to see if the gender of the child in combination with owning an animal had an impact on the Prosocial Behaviour of children

demonstrated that the combination of being either male or female in combination with either owning an animal or not, did not have a significant effect. Looking within a gender (female or male children) on the children who had animals, post-hoc tests showed that actually female children seemed to be more influenced than male children (Figure 2.1a).

The fact that animals influence male children almost as much as female children supports the finding that independent from gender animals can trigger an increase in positive Social Behaviour. Nevertheless it was originally hypothesised that based on the fact that boys are mostly less encouraged to practice nurturing behaviours (Daly & Morton, 2009; Grier, 1999), male children's Social Behaviour is significantly higher influenced than female children's Social Behaviour. That they don't reach such high scores as the female participants could have multiple reasons. One might be that even though the animals reinforce the nurturing behaviour it is just one aspect of Prosocial behaviour. Children in their play years learn a lot of behaviours and social rules from the people in their Microsystem as well as become increasingly affected by their Mesosystem, consisting out of their peers and teachers from kindergarten (Bronfenbrenner, 1986).

Via the process of social learning the child observes his/her parents and experiences how the mother behaves and which roles the females have in the family in relation to what roles the father fulfils in the family (Bandura, 1999). Even though the strict gender differentiation in relation to role fulfilment decreases, parents still encourage gender specific traits in their children. Vicky et al. (1993) studied the behaviour of parents towards their children and found that parents were concerned about gender identification of their children, only 39% of the parents agreed to fulfil a non-traditional task as a model for their children. Besides the direct observable behaviour, the media (books, TV shows) and toys play an influencing role on the child in relation to their identification. Vicky et al. (1993) observed that 68% of the parents bought toys for their children that were considered traditional for the child's gender and only 2% brought toys which were defined as gender neutral. Even though 76% of the parents stated that they think children should be encouraged to play with non-traditional toys, the implementation differed indicating that in actual fact 75% of the parents encourage their children to play with traditional toys. Based on the early influences on the child, starting with the colour of the child's clothes the parents choose as well as the media the child is exposed to (Anderson & Hamilton, 2005), the gender identification sets in before the child is even aware of his/her own gender.

To display Prosocial Behaviour children need to be able to recognize the body language, including facial expressions, to differentiate between emotional states of their peers. The ability to judge an authentic emotional expression is based on the child's capacity to not only pay attention to the openly expressed emotion but also the underlying cues indicating hidden emotions (Gosselin, Perron, Legault & Campanella, 2002). Already 4 year old children rate genuine smiles more authentic than faked smiles (Thibault, Gosselin, Brunel & Hess, 2009). Alper (1993) states that children can learn to read body language based on the interaction with animals and their direct way to express needs and emotions. As the child's age increases, a child's ability to recognize facial expression refines and increases due to cognitive development. The difference between facial expression recognition for males and females and its influence on the Social Behaviour can be explained in terms of female children being slightly ahead of their male peers in terms of development (Bandura, 1999). The cognitive development and the recognition of the social cues can be understood as a partial explanation for the increase of Prosocial Behaviour across the four age groups.

#### *4.1.3. Third Hypothesis*

The third hypothesis stated that since children are highly influenced by their Microsystem, especially until the age of three, siblings can be thought to have a great influence on the child's Social Behaviour. It is thought that older siblings might have a similar function to animals based on their ability to function as a role model and help the children before entering the broader social context to learn empathy, responsibility and establishing an identity (Melson, 2007; Rud & Beck, 2000; Siegel, 2004). In relation to younger siblings the children are able to learn and practice nurturing, which is another crucial aspect for developing an understanding for other people and therefore highly linked to Prosocial Behaviour (Thompson & Gullone, 2003). Therefore a one-way ANOVA was carried out to explore the impact of siblings on Prosocial Behaviour, whereby it was differentiated between four groups of sibling types: Group 1: No Siblings, Group 2: Older Siblings, Group 3: Younger Siblings, Group 4: Younger and Older Siblings. No significant differences were found between the four groups on their levels of Prosocial Behaviour, which let's suggest that sibling type might not have as important an influence as previously thought. To get a better understanding, a 4x2 ANOVA was performed to investigate the influence of sibling types and animal ownership. The absence of an interaction effect suggests that regardless of the presence of a sibling or having any form of sibling, it has no effect on the total scores for

Prosocial Behaviour on either children with pets or children without pets. For pet ownership a statistically significant main effect was found, in contrast to sibling type, which supports that in fact animals are the influencing factor when looking at a child's Prosocial Behaviour. The post hoc independent samples t-test looked at differences between children having a sibling and no animals and children having an animal and no siblings on levels on their Prosocial Behaviour. The children in the category "having an animal and not having a sibling" scored significantly higher than the children in the other category, which supports the previous findings that animals might be one cause for that type of Behaviour.

These findings seem to be contradicting with what has been hypothesised prior to conducting the study, but can be explained by analysing how animals give feedback and teach the child different aspects of behaviours. Animals are able to give unconditional positive feedback and aren't as judgemental as humans (Otterstedt, 2001). The way of communication the child is able to have with the animal is related to the level of trust the child can have in the bond. Studies found that animals are in many cases the first living creature the child's turns to for receiving comfort (Covert, Whiren, Keith and Nelson, 1985). It also strengthens the findings which have been described as the "ice-breaker" function of an animal in situations where the child or person has problems to interact in a social context, by building a relationship to the animal the individual is enabled to find trust in relationships with other people (Holz, 2006). In relation to children who suffer with a disorder or disability, that can be either: physical, mental or psychological, the unconditional positive feedback they obtain from their animal aids them in building up self acceptance, self-efficacy and self-beliefs by experiencing that they are accepted the way they are, that their different condition doesn't make a difference to the animal. Furthermore they can make the experience that they are needed and are able to be responsible in their conditions (Otterstedt, 2001). These aspects in relation to the animal-child interaction in comparison with the interaction between siblings are mostly not influenced by any kind of rivalry which is often observable in children within a family. Furthermore the aspect of sibling rivalry has to be taken into account when looking at the social behaviour of children.

#### *4.1.4. Fourth Hypothesis*

But not every animal is able to give the same kind of feedback and therefore has different effects on the child's Social Behaviour. A one-way ANOVA was conducted to



examine the effect of the different pet kinds on the levels of Prosocial Behaviour. For this reason the children were divided into four groups: Group 1: dogs, Group 2: cats, Group 3: both (dog and cats), Group 4: small animals (consisting of rodents, fish, birds and reptiles). Significance was found between the group with dogs and the group with small animals. This indicates that the effect on the Social Behaviour is decreasing from dogs to cats, from cats to both dogs and cats, where the smallest effect was found for the group with the small animals (Figure 3).

These findings are coherent with the previous findings stating that dogs based on their direct response are able to give the best response to children than other animals (Alper, 1993). Dogs depend more on humans and require a greater involvement of the child in daily interaction than cats do. Cats, even though they are able to give a direct response like dogs, behave in a more independent way than dogs in relation to feeding, their daily exercise, and their interaction with humans. The small animals had a statistically significant lower effect on Prosocial Behaviour than the other animal groups, a comparison of the mean scores of the children who don't interact with animals at home and children who have small animals at home indicates that they have an increasing effect on the child's Prosocial Behaviour. This can be illustrated that even though they can't give a lot of feedback they teach the child aspects of nurturing and responsibility, which are defined as aspects of Prosocial Behaviour (Baron, Branscombe & Byrne, 2009).

## **4.2. Problematic Behaviour**

Besides the effect of animals on Prosocial Behaviour, it was investigated in the influence of pets on the Sum of Problematic Behaviours. This category comprises five different subscales consisting of Hyperactivity/Inattentive, Physical Aggression, Destruction/Delinquents, Indirect Aggression and Emotional Disturbance.

### *4.2.1. First Hypothesis*

Regarding the main hypothesis looking at differences in Social Behaviour no significant differences were found between children with animals at home and children without animals. A closer analysis of the effect of animals on Problematic Behaviours was conducted when looking at gender differences in relation to the impact of animals on the Sum

of Problematic Behaviours. Nevertheless for the female participants a decrease in Problematic Behaviours can be observed in the form of a tendency shown in the Line Graph (Figure XX). The Problematic Behaviour for male children seems not to be influenced by pet ownership.

#### *4.2.2. Second Hypothesis*

The second hypothesis looking at the interaction of gender and pet ownership on the scores for Problematic Behaviours revealed that there was no interaction effect, indicating that gender in combination with pet ownership doesn't influence the Sum of Problematic Behaviours. The post-hoc test conducted looked at the subscales for Problematic Behaviours in relation to the scores of females with an animal in comparison to females without an animal. The independent samples t-test found significant differences between these groups in relation to their scores on Physical Aggression and Indirect Aggression. The higher levels of Physical Aggression found for those with an animal need to be interpreted with caution since the p-value stating the significance is just slightly in the range for significant results.

Owens (1995) suggests that when comparing types of aggressions, female children show more indirect aggression than male children. Renouf et al. (2010) state that different types of aggression can be observed during a child's development since it coincides with their cognitive abilities. Based on cognitive development and their understanding of the social environment, children move from physical aggression and aided by the development of a greater ability to verbally express aggression, they begin to engage in more acts of indirect aggression and use less confrontational methods. Children normally master the Theory of Mind within the age range of 3 to 5 years and become able to understand that each person has a different perspective of reality. Their study found that children who were classified as having Theory of Mind skills scored more highly on indirect aggression, but only if the Prosocial Behaviour skills are quite low. In regards to the previous results, this is coherent with the findings for the first and second hypotheses. The findings indicate that the children/girls with animals showed higher Prosocial Skills, which means that they would be less inclined to display Indirect Aggression than the children (without animal) with lower Prosocial Behaviour. Children with animals and without siblings display higher level of Physical Aggression and a lower level of Indirect Aggression which is suggested to be caused by having to discipline the animal the child feels more comfortable in engaging in more direct confrontation.

For males this effect doesn't seem to occur in the same manner, since no significant differences were found for any of the subscales of Problematic Behaviour between boys who have an animal and boys who don't have an animal. Owens (1995) stated that boys display more physical and verbal aggression over their development and don't engage in as much indirect aggression as girls do. Furthermore, the type of play boys engage in is more active and mostly a kind of rough-and-tumble play. This is suggested to be largely due to gender stereotyping through the parents, who are more inclined to engage in rough-and-tumble play with a male infant than with a female (Vicky et al., 1993). On the basis of the interaction of a male child with his parents and peers and the types of play the child predominantly participates in, the child internalizes these behavioural patterns and applies them in the interaction with his pet.

#### *4.2.3. Third Hypothesis*

It was hypothesised that children with animals and without sibling and children without animals but siblings score similar on the SBQ. A conducted One-way ANOVA didn't find statistically significant differences between the four sibling groups (none, older sibling, younger sibling and both) on the Sum of Problematic Behaviour. The following 4X2 ANOVA explored the effect of the four siblings type and animal ownership on the child's Social Behaviour. Again no statistically significant results were found, indicating, that neither sibling type, nor animal ownership or both of them seemed to have an effect on the Sum of Problematic Behaviour. The further post-hoc tests conducted confirmed that no statistically significant differences were found in relation to children with an animal and without siblings and children without animals but with siblings. When differentiated between the five subscales of the Sum of Problematic Behaviours, children without siblings, but with a pet displayed significantly less Indirect Aggression than children without pet but sibling.

As mentioned in the previous findings, research suggests that Indirect Aggression is related with Theory of Mind skills where low Prosocial Behaviour has a crucial mediating role (Renouf et al., 2010). Previous analyses of the scores indicated that children without animals at home show lower scores of Prosocial Behaviour than the children who have animals at home. When analysing these scores the interference and influence of sibling type was not controlled for. Only the impact of animals was looked at. Even though animals might aid the child's cognitive development and might stimulate an earlier and better understanding

of the Theory of Mind, the presence of siblings can be seen as triggering a similar effect due to practice. The aspect of sibling rivalry can be understood as to why differences with regard to Indirect Aggression independent from gender are observable. Due to sibling rivalry, siblings try to become favoured and be seen as the “good” child by their parents. By applying indirect Aggression, a child is able to make his/her sibling look bad to others and reach the desired feedback from their parents as to whether they have done this successfully. This can be seen as a plausible explanation for why when looking at the influence of siblings in regard to animal ownership independent from gender of the child Indirect Aggression has been found to be statistically significantly higher for children without animals but with siblings.

### **4.3. General Evaluation**

With regard to the findings for Prosocial Behaviour it is coherent with the previous findings and the hypotheses were mostly supported by the analysis of the data. In relation to which gender is influenced more by animal ownership and the role of siblings for the Prosocial Behaviour different findings were observed. The Sum of Problematic behaviours did not seem to be influenced by animal ownership alone. Gender however had an affect and again sibling type didn't seem to play a role.

When previous research is taken into account some of the observations were able to be explained even though they didn't fulfil the stated hypothesis, for some of the other findings, especially for the Problematic Behaviours, suggestions were made built on literature which need to be looked at in future research and limitations of this study should be addressed if possible.

Prior to starting the study it was obvious that the aspect of the parent's subjectivity might be a critical point which needed to be addressed. With the intention of increasing the objectivity of the study two people in the social context of the child (like mother and father) were asked to fill out the SBQ independent from each other. In future research it is suggested that a third party like the kindergarten teacher be involved in the evaluation process which was not applied in this study due to time constraints and not having the required version of the SBQ for the teacher. Furthermore the SBQ's questions about the Problematic Behaviours are formulated quite harshly (e.g. “He/She tortures animals”), which could have been the reason why some of the parents got defensive of their children and did not answer as accurately as possible. The researchers were informed of this occurrence through feedback given to the

kindergartens from the parents. Based on the diagnostic element of the questionnaire it could be possible that the questions were not sensitive enough to detect differences in Problematic Behaviour scores within children who are displaying regular Social Behaviour patterns. Therefore, a more sensitive questionnaire in regards to Problematic Behaviours should be applied to explore the effect of animals on this type of behaviour. This would be especially important for gaining an insight into the findings of the types of Aggression in combination with gender differences and animal ownership.

Original the study was intended to be a longitudinal and cross-sectional study exploring the development of Social Behaviour within children in their Play Years. But due to parental concerns and a large proportion of participant's wish to remain anonymous this could not be implemented. This should be addressed in subsequent research in this field to explore what changes can be observed during a child's development and attempt to control for more confounding variables. Since siblings were thought to have an important influence on the Social Behaviour of the child it was addressed in the third hypothesis and is suggested to be looked at in future studies to get a better understanding of the findings. In case of a longitudinal study it is proposed to investigate at when the first influence of the animal on the child is observable and especially how much interaction is necessary to increase a child's Prosocial Behaviour. These findings are important for establishing applications and animal-assisted interventions for young children.

Furthermore for generalising and applying these findings to the general population it is necessary that independent researchers replicate this study and extend the geographical research area. One major strength of the current study is that the data was collected from kindergartens that had different socioeconomic backgrounds. The sample size was satisfactory especially because the distributions for the different groups (e.g. animal ownership, gender, and type of animals) were equally distributed. Based on the nature of the data, quite robust analyses were able to be conducted.

In addition to the quantitative data, parents were able to give additional information about the development of their child. When exploring the data given in these answers, a pattern was seen in that one beneficial factor was often related to pet ownership. For instance children with different disabilities or disorders seem to have an animal which can be argued as having the function of an emotional support and bridge for the interaction with other children (Covert, Whiren, Keith & Nelson, 1985; Levinson & Mallon, 1997).

#### **4.4. Possible Applications**

Even though the findings suggest that animals have a statistically significant influence on a child's Social Behaviour, more research has to be done to generalize the studies and test for ecological validity. Nevertheless it is suggested to develop kindergarten programmes which enable children to interact with animals on a daily basis. Since dogs have been found to have the greatest effect on the Social Behaviour of children, it is proposed to develop a "dog-assisted-kindergarten-programme". These programmes could be focused on children who have a hard time socializing and interacting with their peers. Especially in the beginning when children enter the social environment of the kindergarten the first time, the dog (or if desired a smaller animal) can be used as a bridge between children as well as possibly giving them a place to go to when overwhelmed by the new situation. Since children are mostly inexperienced in the handling of animals, supervision in some kind would be suggested. Even though dogs seem to have the most significant influence on a child's Social Behaviour, the animal must be chosen according to what care can be prepared.

Furthermore it could aid children who have been hospitalised for a longer time due to a disease and have to start building new social interactions whereby their peers might react differently to them, so that the animal can function as an "ice-breaker" for building friendships and emotional support in times of stress. In this context the child-animal bond is invaluable for children with traumatic experiences, like maltreatment, neglect or death of a close person, enabling the child to build trust with living creatures again. Next to only focusing on institutional and educational setting it is debatable if it is possible to allow children the interaction with an animal. This could be done by inviting children from the general population to animal shelters where child and animal get the chance to interact.

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## 6. APPENDIX

**Social Behavior Questionnaire**  
**Elternversion 4-11 Jahre (SBQ-EL4-11) – Deutsche Fassung**

Auf den folgenden Seiten finden Sie Beschreibungen von Verhaltensweisen, die Kinder zeigen. Bitte lesen Sie jede einzelne Beschreibung durch und entscheiden Sie, inwieweit diese Beschreibung auf Ihr Kind zutrifft. Sie können zwischen vier möglichen Antworten wählen:

- 0 = für mein Kind trifft diese Beschreibung nicht zu  
 1 = für mein Kind trifft diese Beschreibung manchmal oder etwas zu  
 2 = für mein Kind trifft diese Beschreibung meistens zu  
 8 = nicht beurteilbar; darüber kann ich keine Auskunft geben

	trifft nicht zu	trifft manch- mal/ etwas zu	trifft meistens zu	nicht beurteil- bar
1. Es zeigt einem anderen Kind, das einen Fehler gemacht hat, sein Mitgefühl.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
2. Es kann nicht still sitzen, es ist unruhig oder überaktiv.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
3. Es zerstört seine eigenen Sachen.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
4. Es hilft einem anderen Kind, das verletzt wurde.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
5. Es stiehlt zuhause.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
6. Es wirkt traurig, unglücklich oder depressiv.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
7. Es kämpft oft mit anderen Kindern.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
8. Es hilft freiwillig mit, ein Durcheinander aufzuräumen, das jemand anderes verursacht hat.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
9. Es ist unaufmerksam; hat Schwierigkeiten, bei einer Sache zu bleiben.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
10. Es bringt andere Kinder dazu, sich gegen einen Gleichaltrigen zu verschwören, den es nicht leiden kann.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
11. Es ist nicht so glücklich wie andere Kinder.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8
12. Es zerstört Sachen unserer Familie bzw. die von anderen.	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 8

	trifft nicht zu	trifft manch- mal/ etwas zu	trifft meistens zu	nicht beurteil- bar
13. Wenn es Streit oder Auseinandersetzungen gibt, wird es versuchen, diese zu beenden.	0	1	2	8
14. Es ist ein zappeliges, nervöses Kind.	0	1	2	8
15. Es ist in der Schule/im Kindergarten ungehorsam.	0	1	2	8
16. Es kann sich nicht konzentrieren bzw. hat eine kurze Aufmerksamkeitsspanne.	0	1	2	8
17. Es ist sehr furchtsam oder ängstlich.	0	1	2	8
18. Wenn es auf jemanden wütend ist, dann schließt es mit anderen aus Rache Freundschaft.	0	1	2	8
19. Es ist impulsiv und handelt ohne nachzudenken.	0	1	2	8
20. Es schummelt oder erzählt Lügen.	0	1	2	8
21. Es bietet anderen Kindern, die Schwierigkeiten mit einer Aufgabe haben, seine Hilfe an.	0	1	2	8
22. Es ist besorgt.	0	1	2	8
23. Es hat Schwierigkeiten, so lange zu warten, bis es an der Reihe ist.	0	1	2	8
24. Wenn ein Gleichaltriger es aus Versehen verletzt hat (z.B. es gestoßen hat), glaubt es, dass dieser es absichtlich getan hat, und reagiert dann ärgerlich und beginnt eine Rauferei.	0	1	2	8
25. Es neigt dazu, Dinge allein zu tun, ist ein Einzelgänger.	0	1	2	8
26. Wenn es auf jemanden wütend ist, erzählt es hinter dessen Rücken Gemeinheiten.	0	1	2	8
27. Es greift andere Kinder körperlich an.	0	1	2	8
28. Es tröstet ein Kind, das weint oder betrübt ist.	0	1	2	8
29. Es weint sehr oft.	0	1	2	8
30. Es ist zerstörungswütig.	0	1	2	8

	trifft nicht zu	trifft manch- mal/ etwas zu	trifft meistens zu	nicht beurteil- bar
31. Es gibt leicht auf.	0	1	2	8
32. Es bedroht andere.	0	1	2	8
33. Es hilft spontan, etwas aufzuheben, das ein anderes Kind fallen gelassen hat (z.B. Stifte oder Bücher).	0	1	2	8
34. Es kann sich nicht länger als ein paar Minuten auf etwas konzentrieren.	0	1	2	8
35. Es erscheint unglücklich, weinerlich oder bedrückt.	0	1	2	8
36. Es ist grausam und gemein zu anderen oder tyrannisiert andere.	0	1	2	8
37. Es starrt ins Leere.	0	1	2	8
38. Wenn es auf ein Kind wütend ist, bringt es andere dazu, nicht mehr mit diesem Kind zu reden.	0	1	2	8
39. Es wirkt nervös und angespannt.	0	1	2	8
40. Es tritt, beißt oder schlägt andere Kinder.	0	1	2	8
41. Es lädt Kinder zum Mitspielen ein.	0	1	2	8
42. Es stiehlt außerhalb von zuhause (z.B. im Supermarkt oder in der Schule/im Kindergarten).	0	1	2	8
43. Es ist unaufmerksam.	0	1	2	8
44. Es fühlt sich offensichtlich nicht wohl.	0	1	2	8
45. Es hilft anderen Kindern, die sich krank fühlen.	0	1	2	8
46. Wenn es auf jemanden wütend ist, erzählt es ein gemeinsames Geheimnis weiter.	0	1	2	8
47. Es lobt die Arbeit von weniger fähigen Kindern.	0	1	2	8
48. Es quält Tiere.	0	1	2	8

**Figure 1:** German version of the Social Behaviour Questionnaire (in the package for the parents the questionnaire was attached behind the Demographic Questionnaire).

Liebe Eltern,

Dieses Schreiben geht an Sie, weil ich Sie um Teilnahme an meiner Umfrage bitte. Ich heiße Mareike Weihrauch und studiere zurzeit Psychologie in Dublin, Irland. Für meine Bachelorarbeit wird gefordert, dass wir uns ein Thema aussuchen und eine Befragung durchführen. Ich habe mich schon immer für das Feld der Kinder- und Jugendpsychologie interessiert. Da ich geborene Papenburgerin bin habe ich mich entschlossen, meine Daten im Emsland und den angrenzenden Landkreisen zu sammeln.

An diesem Schreiben ist ein Fragebogen angeheftet, welchen ich Sie bitte auszufüllen. Es wäre schön, wenn zwei Erziehungsberechtigte den Bogen ausfüllen würden. Es wäre gut wenn sie kennzeichnen würden, wer welchen Bogen ausgefüllt hat (z.B. Vater, Mutter, Oma, Lebensgefährte, etc.) Ich frage keine persönlichen Daten ab, welche Rückschlüsse auf die Familie zulassen, da ich Ihnen gerne höchste Anonymität und damit Sicherheit vermitteln will. Zudem werden die Daten auf einer geschützten Externen Festplatte gespeichert.

Die Studie befasst sich mit der Einflussnahme von Haustieren auf die Entwicklung von Kindergartenkindern, aus diesem Grund frage ich zu Beginn des Fragebogens ob Tiere in ihrem Haushalt vorhanden sind. In der Auswertung des Fragebogens unterscheide ich dann, ob Kinder die mit einem Tier in häufigen Kontakt sind, ein anderes sozial Verhalten zeigen. Bitte lassen Sie sich nicht abschrecken von dem Fragebogen, dieser ist standardisiert und erstellt worden aufgrund von Beobachtungen von Erziehern, und ich habe nicht die Absicht Sie zu verunsichern.

Ich wäre Ihnen sehr dankbar, wenn Sie sich ein paar Minuten Zeit nehmen würden und die Fragen so gut wie möglich ausfüllen würden. Natürlich ist alles freiwillig und Sie können sich entschließen es nicht auszufüllen oder abzugeben. Wenn Sie irgendwelche Bedenken, Fragen oder Anmerkungen haben wenden Sie sich gerne an mich und ich beantworte Ihnen gerne jegliche Fragen.

**Wenn Sie den Fragebogen nicht ausfüllen möchten, dann geben Sie bitte trotzdem den Fragebogen unausgefüllt zurück.**

Viele Dank für Ihre Unterstützung.

Mit freundlichen Grüßen

Mareike Weihrauch

Tel: [REDACTED]

email: [REDACTED]



**Figure 2:** *Consent Form which was given to the participants.*

Demographische Daten

Dieser erste Teil ist notwendig um die Kinder den Altersgruppen zuzuordnen und um in Kenntnis zu bringen ob Tiere im nahen Umfeld der Kinder sind. Bitte kreisen sie die betreffende Antwort an oder füllen die Lücke aus.

Familienkonstellation:

- 1) Alter des Kindes: \_\_\_\_\_
- 2) Geschlecht des Kindes: Mädchen    Junge
- 3) Anzahl der älteren Geschwister: \_\_\_\_\_
- 4) Anzahl der jüngeren Geschwister: \_\_\_\_\_

Haben Sie Tiere zu Hause mit denen das Kind in Kontakt ist?                      Ja        Nein

Wenn „ja“ welche und wie viele?

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Haben Sie irgendwas was Sie gerne erwähnen würden, dass speziellen Einfluss auf die Entwicklung Ihres Kindes hat/hatte?

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**Figure 3:** *Demographic questionnaire which was distributed to the participating parents.*

**Table 1:** *Frequency Tables and Descriptive Statistics for the main IVs and DVs.***Categorical Data**

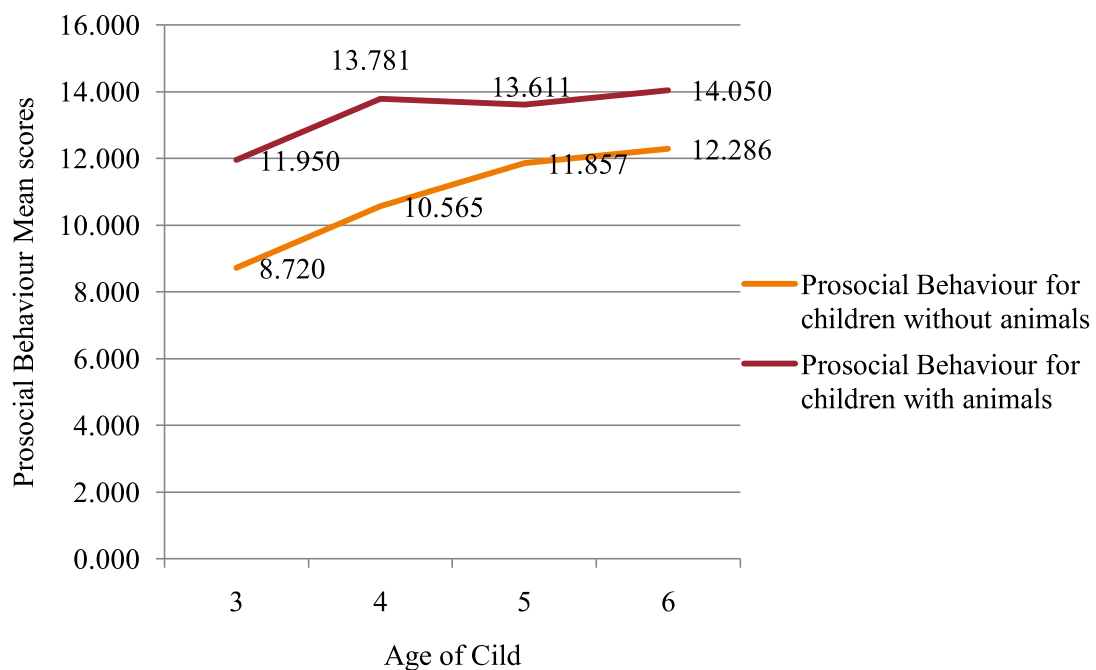
<b>Variables</b>		<b>N</b>	<b>Percent</b>
<i>Animal Ownership</i>	Yes	109	58.9%
	No	76	41.1%
<i>Animal Ownership “Yes” x Gender</i>	Female	50	45.9%
	Male	59	54.1%
<i>Animal Ownership “No” x Gender</i>	Female	37	48.7%
	Male	39	51.3%
<i>Kind of Animal</i>	Dog	33	30.3%
	Cat	22	20.2%
	Both (Dog & Cat)	26	23.9%
	Small Animals	28	25.7%

**Continuous Data***Animal Ownership “Yes”*

<b>Variables</b>	<b>N</b>	<b>M</b>	<b>SD</b>
<i>Prosocial</i>	107	13.393	3.406
<i>Hyperactivity/Inattentive</i>	108	4.884	3.901
<i>Physical Aggression</i>	108	1.269	1.486
<i>Destruction/Delinquents</i>	108	1.000	1.092
<i>Indirect Aggression</i>	108	0.282	0.667
<i>Emotional Disturbance</i>	108	2.206	1.346
<i>Sum of Problematic Behaviours</i>	105	11.024	7.018

*Animal Ownership “No”*

<b>Variables</b>	<b>N</b>	<b>M</b>	<b>SD</b>
<i>Prosocial</i>	76	10.474	3.840
<i>Hyperactivity/Inattentive</i>	75	4.493	3.213
<i>Physical Aggression</i>	76	1.026	1.291
<i>Destruction/Delinquents</i>	75	1.153	1.412
<i>Indirect Aggression</i>	75	0.560	0.874
<i>Emotional Disturbance</i>	76	2.454	1.633
<i>Sum of Problematic Behaviours</i>	73	11.308	6.286



**Figure 4:** Line Graph illustrating the Mean scores for Prosocial Behaviour across the age groups differentiating between pet owner and not pet owner.