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Humane Education: the Effects of Animals in the Classroom on Children's Empathy in Japanese Elementary Schools

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THESIS APPROVAL

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ABSTRACT

An abstract of the thesis of Mika Maruyama for the Master of Science in Psychology presented May 9, 2005.

Title: Humane Education: The Effects of Animals in the Classroom on Children's Empathy in Japanese Elementary Schools

Although humane education, promoting children's kindness toward animals, has been evaluated as a factor influencing children's kindness toward humans later in their life, the effect of a classroom pet hasn't been well studied. The current study investigated the influence of intensified daily interactions with living animals in the classroom on the development of empathy among Japanese children. Specifically, the study examined (a) the effect of introducing animals into the classroom on children's empathic behaviors and attitudes, and (b) the generalization of this animal-directed empathy to humans.

Eight hundred fifty three students (in grades two through five) from ten elementary schools in Japan either engaged in intensive, guided interactions with two to three guinea pigs per class (the experimental group, E group) or did not interact with guinea pigs or otherwise receive special curricula (the control group, C group). Students were further divided into two groups by grade: younger students (second and third graders) and older students (fourth and fifth graders). Student in the E group cared for the guinea pigs throughout the academic year. Students completed surveys

designed to measure children's empathic attitudes toward animals and humans at the beginning of the academic year and again eleven months later, at the end of the year.

Students' self-reported empathy toward animals significantly correlated with reported empathy towards people for all ages tested. In addition, within-participant comparisons of E versus C group posttest scores between younger and older students suggest that introducing a pet into the classroom may be more effective in supporting empathic development for older students than with younger students. The daily experiences of non-verbal communication with animals may help children become more likely to consider the feelings of "others" and to take into account another person's point of view.

HUMANE EDUCATION: THE EFFECTS OF ANIMALS IN THE CLASSROOM ON CHILDREN'S EMPATHY IN JAPANESE ELEMENTARY SCHOOLS

by

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CHAPTER I: INTRODUCTION

Animals have been a critical presence to humans throughout history: as food products, instruments for defense, and pets. Animals have long been perceived as beneficial to human's well-being, and it has long been assumed that humans naturally form psychological bonds with animals. It is believed that animals, specifically companion animals (e.g., pet dogs), have a tremendous impact on human's psychological and physiological well-being (e.g., Levinson, 1962; 1969; 1972).

More recently, attention to animals as companions has been focused on healing humans psychologically. Pets may represent a mental health resource of vast importance in our technological society, as they did in primitive human society. Animals were originally domesticated in primitive society for their economic and emotional benefits to humans (Levinson, 1972). The past couple of decades have provided significant technological, economic, and societal changes throughout the world. In 1990 only 3 % of the US population lived in rural areas, and 97% lived in large urban areas. In contrast, 83 % of the U.S. population lived in rural America, and only 17 % lived in large urban areas in 1890 (as cited in Kidd & Kidd, 1997). These increases in urbanization as well as technological, economical, and societal advances have led to important changes in relationships among people and their pets. It is speculated that people today have fewer opportunities to directly bond with other

people (e.g., using the internet or a vending machine to buy goods instead of communicating/interacting with people at a store). Humans are now seeking peace of mind, and the presence of animals seems to have healing and relaxing effects on humans (see Beck & Katcher, 1996). This area of study is gaining attention particularly among child psychologists, counselors, medical doctors, educators and researchers from various other fields. Researchers have started to address the use of animals in school settings.

The purpose of the current study is to investigate whether bonding with animals will promote humans' psychological well-being. Specifically, the purpose of this study is to determine whether animals can effectively promote children's empathy, and whether children's empathy toward animals will generalize (transfer) to humans. Although the current study is based on previous studies conducted in the US (i.e., Ascione, 1992), we intensified the degree of children's engagement with animals by providing children with the opportunity for everyday interactions with animals, as opposed to earlier work in the U.S., which only provided a traditional humane education program without everyday contact. The current study, via survey methodology, focused on how more intensive interactions with living animals, compared to a traditional humane education program without contact with living animals, will influence children's empathy. Thus, the study explores: a) whether intensified humane education in the school setting will influence children's empathy; and b) whether Japanese children will experience the same benefits as US children have experienced in past humane educational research.

Psychological Processes Engaged in Humane Education

When we communicate or interact with animals, we often make assumptions based on animals' behaviors in order to interpret animals' responses. When we communicate with animals, we have to pay much more attention to the partner we are interacting with than when we communicate with humans because animals do not give us a clear verbal response. An animals' inability to speak forces children to evaluate what animals are experiencing (e.g., thinking, feeling, etc.) and what their needs are through interpreting their behaviors and projecting how they themselves might feel. Guiding children to be mindful of animals' needs and to treat animals with sympathy have been shown to affect children's future behavior toward other humans (Ascione, 1992). By interacting with and caring for animals, children learn to interpret non-verbal signals based on behaviors and contexts. This empathic orientation is expected to generalizable toward humans. Therefore, introducing animals to children is expected to not only increase their current understanding of non-verbal behaviors, it is also expected to increase their future empathy toward humans.

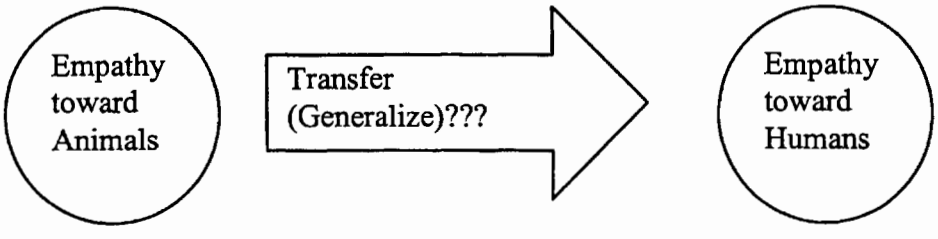

Figure 1 Diagram for psychological processes in humane education

CHAPTER II: LITERATURE REVIEW

Interaction with Animals: Physiological and Psychological Effects on Humans

Research and clinical observations have shown that bonding with animals can have a positive effect on human health. Ascione (1992) discussed that employing animals in children's psychological treatment can be highly effective for children with emotional problems. Animals can also effectively support normally developing children who experience stress during critical moral development stages. Bonding with animals has been shown to result in both psychological and physiological effects. Serpell (1991) reported a highly significant reduction in minor health problems and considerable improvement in psychological health. Animal assisted therapy has been shown to reduce blood pressure and stress levels for humans, and result in changes in speech patterns and facial expressions (Friedmann et al., 1983; Baun et al., 1984; Katcher et al., 1984; Katcher, 1988; Wilson, 1991; Allen et al., 1991; Anderson et al., 1992). Robin and Benssel (1985) found that people's blood pressure tends to rise when they talk to other people, although people's blood pressure tends to lower when they talk to or observe animals. These findings all point to the beneficial and influential benefits animals provide to humans.

The Effect of Physical Contact

As infants begin to grow, the caregiver supplies them with the warmth and softness that infants associate with love and security. According to the seminal "contact comfort" work of Harlow and Zimmerman (1959), physical contact with a caregiver, primarily the mother, which includes her soft and comforting presence,

contributes significantly to the formation of attachment (Bowlby, 1969). These experiences make infants associate soft, pleasurable tactile sensations with a secure sense, and the desire for this contact appears to be human nature (Levinson, 1984). Levinson (1984) explained this contact releases endorphins in the nervous system, which alleviate anxiety and help to form the foundation of the social attachment.

It is argued that soft contact may begin to evoke experiences of being loved and secure. Subjective reports found that soft touch and stroking sensations have been shown to reduce tension and produce relaxation (Levinson, 1984). A possible mechanism for these effects might be that soft contact brings about the opiate receptors in the limbic system, corpus stratium and hypothalamus through the production of endorphins (Pert & Gulley, 1977). Endorphins are a by-product of complex, biochemical reactions in the brain, which are not yet fully understood.

Although many public elementary schools in Japan have "soft" pets, such as rabbits, schools tend to keep pets outside of classroom (e.g., corner of the school yard). In the survey study conducted by Hatogai (2004), he found that 88 % of public elementary schools have pets, yet 95.4 % of them keep them outside of classroom, and only 1.4 % of them keep pets inside of the classrooms. Unfortunately, the combination of the location and a lack of time or encouragement from others (i.e., teachers, peers or guardians) make it unlikely that students will interact with these "soft" pets. Those schools that have a pet inside of the classroom tend to choose fish as pets because they are easy to care for and there are reduced concerns about allergies. Japanese schools that have a "soft" pet (e.g., hamsters, rabbits, guinea pigs)

inside of classroom are rare. However, the current study anticipated that "soft" pets will be more likely to affect children's empathy and may intensify the degree of attachment between animal and child. Thus, the study intended to expose the experimental group to guinea pigs in order to expose students to the benefits of a "soft" pet.

Attachment to Animals

Attachment theory provides a useful framework for understanding children's relationship with pets, as well as with others in their social network. Bowlby (1969) defined attachment as a strong affectional tie that binds a person to an intimate companion. Although this definition implies that attachment exists only between humans, a study by Melson and Fogel (1989) found that young children displayed attachment behaviors toward animals, especially their pets.

Levinson (1984), the pioneer of animal assisted therapy, stated that psychotherapy is alive and effective, provided that it has either one or both of the following ingredients: touch comfort and human or animal companionship. He emphasized that physical contact with animals and attachment formation to companion animals can make psychotherapy more effective. Bowlby (1969) stated that both animal and human companionship, which is a psychologically based set of behaviors, are initiated by attachment behavior, which is a biologically based set of actions. As discussed above, touching a soft object (e.g., a security blanket) arouses pleasant feelings. Young children are often attached to a "security blanket" and this attachment often promotes children's adaptive behaviors by enabling them to draw on

their inner resources even when their primary attachment figures (i.e., caregivers) are separated from them (Levinson, 1984). Levinson (1984) explained, "by extension from the transitional object (e.g., blanket), secure, euphoric feelings can be transferred to a real animal, familiar, soft, and furry, such as a dog" (p. 134).

One of the classic studies of attachment was conducted by Harlow and Zimmerman. Harlow and Zimmerman (1959) investigated how baby monkeys form attachments with different types of fake "mother" figures. The researchers reared baby monkeys in cages with two "mother" figures, one made of wires, which was equipped with a bottle of food, the other made of wire covered with soft cloth, which was not equipped with a food source. One group of monkeys had both types of mother (wire and wire with cloth), while the other group had only the wire "mother." Harlow found that both groups of monkeys spent significantly more time with the cloth "mother," especially when they were in distress. Follow-up studies showed that those monkeys that had never been touched by another monkey developed severe emotional and social pathology, and an aversion to touching and being touched later in life (Lichtenstein & Sackett, 1971). This study indicates that tactile stimulation is very important for monkeys to grow up psychologically healthy. Prescott (1976) asserted that humans who have been deprived of tactile stimulation in early childhood may develop similar symptoms. Although we have to be careful about generalizing research results from animals, the behavior of primates has frequently been found to parallel human behavior (Levinson, 1984). Hence, these studies imply that physical contact (e.g., touching), especially contact with soft items, makes humans feel

comfortable and secure. These experiences are particularly important during early developmental periods for both human and animals.

Attachment theory suggests that children form an internal working model of every attachment relationship (Bretherton, 1985). Their internal model consists of the ideas and feelings about a relationship, which the child stores as mental representations. These cognitive constructs are viewed as developmentally significant because they make the attachment relationship cognitively available to the child even when the attachment object is physically absent. In addition, some attachment relationships are generalized, making them applicable to other, similar relationships (Melson, 1991). For instance, the internal working model of the mother-child relationship is thought to be carried into adulthood; when a child grows up and becomes a parent, the internal working model provides the initial ideas for this next-generation mother-child relationship (Melson, 1991). It is important to note that even if children cannot form attachment securely with their caregiver, they may be able to experience compensatory attachment with a pet.

Although the percentage of pet ownership reported varies, studies consistently report a high percentage of pet ownership. Today, dogs and cats are the most popular home pets in the US. Kidd and Kidd (1985, 1987) reported that the ability to attach to pets begins as early as 18 months. Bustad (1996) pointed out that our changes of lifestyle necessitate animal companionship. Many people live alone and many married couples are choosing not to have children. Many fathers and mothers work outside the home, usually at different locations and sometimes on different schedules.

Children spend most of the time at school or daycare centers, and even at home children often spend a great deal of time watching TV. This deprivation of nurturing opportunities has resulted in increased stress, depression, and loneliness. These changes have led to serious challenges to the overall health and well-being of a significant segment of our population (Bustad, 1996). Companion animals can serve as nurturers for many people, promoting touching, playing, and sharing with few time restraints.

The nuclear family and close neighborhood are typically the primary places in which the human emotions of love and empathy are taught. There has been a decrease in extended families and close-knit neighborhoods in the 20th century (Levinson, 1980). These meso-systems provided learning experiences for attaining socio-emotional needs in the past. The decline of those experiences for children has created a need for a new source of prosocial learning experiences. Introducing children to animals may fill the current void in children's prosocial learning experience because companion animals' unconditional love may help meet children's psychological needs. Levinson (1969) described the relationship between children and companion animals as unconditional, and pointed out the importance of animals' acceptance of children "as is" without feedback or criticism. Children often perceive their companion animals as their most understanding listener. Beck and Katcher (1996) suggested that pets exhibit many of the characteristics of the trusting mother. The pet is unconditional, devoted, attentive, loyal and non-verbal. All of these elements are evidenced in mother-child relationships. Thus, there is a reason to think that animals

may compensate or enhance children's socialization and attachment, and this may help increase well-being.

Roots of Humane Education

Although research on children's relations with animals, including humane education implemented by teachers has been conducted prior to this century, empirical research in this area is a recent phenomenon as Asicone (1997) pointed out. However, the approach to animal-child interaction became dramatically popular after Levinson (1962) advocated animals' effectiveness in testing human's psychological well-being. Scientific research on the effect of humane education has gained attention since the early 1980s.

Although efforts at humane education in the school setting have been concentrated in the lower elementary grades (Cameron, 1983), Fitzgerald (1981) suggested introduction of animals is more influential when children reach the ages that they could take on daily chore responsibilities. Since no standardized curricula for humane education has been established (Cameron, 1983), researchers have implemented various types of humane educational programs in an effort to determine how different types of programs affect children. Such researchers were interested in how children make moral decisions, what motivates them to help others, how they learn, think, and feel about animals, and how they interact with humans and animals.

One of the early studies on humane education in a school setting was conducted by Vockell and Hodal in 1980. The researchers implemented a one-time humane education program in the classroom and assessed the children's humaneness

after the one-day program. The program consisted of a single school visit (third through sixth graders) by a humane educator using printed materials and posters. Students were randomly assigned into three groups: *Intensive Treatment Group* (received a 60-minute presentation with audio-visual enrichment taught by trained humane education facilitators with print and poster materials), a *Light Treatment Group* (received print and poster materials), and a *Control Group* (no materials or programs were provided).

Vockell and Hodal (1980) developed a questionnaire, "Billy and the Fireman Test" to assess children's humane attitudes toward animals. Students were told that the house of a boy (Billy) who is about the same age as they are is now on fire. The fireman has told Billy that his house would be totally burned down, but he could save only three things from his house before his house would be totally lost. Students are given a list of ten objects in the house (e.g., cats, dogs, computer, bankcard) and asked to choose three of them that they think Billy should save. The rationale behind this instrument is that a person with humane attitudes toward animal life will likely choose the animals since they cannot be replaced. Vockell and Hodal found that the mean scores observed in the two treatment classes on the Fireman Test exceeded that of the control group. However, the lack of pre-treatment data may limit the generalizablity of the results as the possibility of pre-existing differences cannot be ruled out.

Fitzgerald (1981) replicated Vockell and Hodal's study. He investigated the impact of humane education on fifth and sixth graders by dividing them into four different groups. Three of the conditions were identical to the treatments used by

Vockell and Hodal (i.e., *Intensive Treatment, Light Treatment, Control Group*), and the new group was exposed to "*Repeated Treatment*" in order to examine the impact of the length of humane education. In the *Repeated Treatment Group*, four humane education lessons were given to the repeated treatment group every other week over a two-month period. Fitzgerald hypothesized that this repeated treatment would have a greater impact on attitude development than either of the other two treatments. The Fireman Test was used in a pre-post-test design. Contrary to Fitzgerald's hypothesis, the analysis of covariance of the Fireman Test (pre-test scores as covariate) indicated significant improvement of the mean score for the *Intensive Treatment* condition. In other words, children's scores in the *Intensive Treatment Group* were significantly above that observed for the *Repeated Treatment, Light Treatment,* and *Control groups*. Fitzgerald concluded that a tight, specific, focused program, combined with good pedagogical strategies and classrooms presentation could have a positive impact on children's humane attitudes.

Ascione (1992) examined the impact of a year-long humane education program. Thirty-two classrooms (first, second, fourth, and fifth graders) were randomly assigned into the experimental and the control group. The experimental group was introduced to humane education with printed materials. The effects of the program on children's attitudes toward animals, as well as generalization of effects to human-directed empathy were measured. Ascione developed surveys used to assess children's humane attitudes toward animals (Primary Attitude Scale and Intermediate Attitude Scale), and he used Bryant's questionnaire to assess children's empathic

skills toward humans (Empathy Index). Ascione found no significant attitudinal differences in second graders' post-test scores on the attitude scale between the experimental and control groups. However, he found significant differences on fourth graders' score between the control group and the experimental group. Ascione also found that attitude scale scores of both younger students (first and second graders) and the older students (fourth and fifth graders) were significantly correlated with Bryant's Empathic Index questionnaire. Ascione concluded that these correlations provide evidence for a relationship between children's humane attitudes toward animals and their human directed empathy.

Promoting children's kindness toward animals has been evaluated as a factor influencing their future empathy toward humans (Ascione, 1992, 1993, 1997). Numerous studies have shown that children who spend time with, care for, and interact with animals are more likely to show empathic behaviors toward humans in the future (e.g., Ascione, 1992, 1993, 1997; Cameron, 1983, Fitgerald, 1981, Nakagawa, 1998). Literature from several researchers (Arkow, 1998; George, 1998; Levinson, 1969) indicates that the introduction of animals into the lives of children is particularly effective in developing morality, empathic behaviors, self-esteem, self-control, and responsibility. Most significantly, an animal's dependence on children can teach behaviors not typically acquired through formal curriculum. Specifically, an animal's dependency can teach children responsiveness to needs, interpretation of non-verbal behaviors, and assuming responsibility for others.

Origin of Empathy

The definition of prosocial/altruistic behavior differs amongst psychologists from diverse theoretical background. Ascione (2002) defined empathy as "a critical component of prosocial behavior, a term that connotes kindness, helping, cooperation, nurturance, and unselfishness in our relations with others" (p. 19). Eisenberg (1977) defined prosocial behavior as "actions that are intended to aid or benefit another person or group of people without the actor's anticipation of external rewards" (p. 4). Finally, Staub (1978) defined prosocial behavior simply as behavior that benefits other people.

According to Eisenberg (1983), school aged children who are exposed to a generous model are more generous themselves than are children who have not been exposed to a generous model. Similar effects have been found in preschoolers' and kindergartners' imitation of prosocial models. Moreover, the effects of observing a prosocial model have been found to persist over time and have been shown to generalize to new and different situations (Staub, 1971, Yarrow, Scott, & Waxler, 1973). Borke (1973) found that three-year-old children (American and Chinese) are capable of differentiating between happy and unhappy responses in other people and can recognize social situations associated with these responses regardless of their cultural background. Those findings may imply that introducing animals into children's micro systems may increase their familiarity with empathic behaviors regardless of different cultural backgrounds. In other words, introducing a prosocial

target (i.e., animals) to children may establish linkages that encourage with children's empathic behaviors toward humans.

Gender Differences in Children's Empathy

Numerous research studies have found that there is a significant interaction between children's gender and their empathic skills (e.g., Eisenberg, 1983, 1989; Owens & Ascione, 1990). It has been reported that girls are more likely to be more sympathetic to others and to be better care takers than boys. Observational studies of children with unfamiliar infants found that boys decrease and girls increase their behavioral interest in and responsiveness toward babies as they approach the age of five (Melson & Fogel, 1982). According to Melson and Fogel (1982), children do this as they acquire gender-appropriate behaviors, because nurturing others is linked to gender-role characteristics. As a result, boys and girls establish differing repertories of nurturance-related skills (Melson & Fogel, 1982).

Interestingly, when children's ideas about babies and their care were assessed, Melson, Fogel, and Toda (1986) found that boys were just as knowledgeable regarding baby care as girls were. When children were directly observed, however, boys showed less interest in nurturing babies. Melson, Forgel, and Toda discovered that children select from among multiple "targets" of nurturance, depending upon availability, gender-role, expectations, and other factors. Boys may develop more ideas about animals than do girls. Theoretically, the view that children select among multiple "targets" of nurturance suggests that boy's interests in animals may increase at about the time when their interest in baby-directed nurture declines, suggesting that

babies are less available to boys as targets of nurturance (Melson & Fogel, 1990). Fullard and Reiling (1976) reported that boys preferred animal pictures to human pictures as early as second grade. In addition, boys have been found to mention animals more frequently than do girls in reports of dreams (Van der Castle, 1983). When asked to generate a list of animals, boys aged 8 to 16 mentioned approximately twice as many different animals than did girls of similar age (Freed, 1965). Melson and Fogel (1990) discovered the mean of boys' test score on knowledge concerning animal care was higher than the mean score of girls. Because girls are found to have greater verbal skills than boys, it seems unlikely that the results are due to gender differences in language development.

According to Berman and Goodman (1984), boys decrease their behavioral interest in human infants and avoid or resist caregiving situations as they reach the period from preschool to the early elementary years. Yet, boys' knowledge concerning human infant increases with age, and the presence of younger sibling increases that knowledge, just as it does for girls (Melson, Fogel, & Toda, 1986). However, with respect to cognition about animal care, boys seem to gain even more than girls do with advancing age and benefit more from the presence of a younger sibling. This supports the view that young boys may be more receptive toward knowledge concerning animals than girls, because caring for animals is not associated with the same pattern of gender differences as infant care.

Although boys might not show empathic behaviors as often as girls, possibly due to perceptions relating to gender-role desirability, the current study expects that

exposure to animals will promote empathic behaviors toward animals among both boys and girls. In terms of the proposed study, differences between boys and girls should be detected with initial measures, (i.e., girls may score higher on the initial measures of empathy). This is particularly likely with the younger second and third grade students. It is, however, expected that boys will then show strong effect in empathy and nurturance behavior in the post experience measures. These gains could be influenced by age, yet I am not prepared to make any specific age by gender interaction predictions.

The Impact of the Educational System on Japanese Students

The Japanese educational system is highly demanding. In acknowledgement of the effect of the competitive educational system on Japanese students, the Ministry of Education cut school attendance from six days to five days a week. Facing the shortened schedule, most elementary schools cut extra programs, such as moral education, in order to accommodate the shortened hours. Japanese students are now going to *juku* (a cram school) on the weekends to catch up for these missed school days (Dolly, 1993). Ironically, the changes in school hours that originated for the purpose of preventing overly high demands made children's life more stressful. The U.S. Department of Education (2002) indicated that Japanese mothers start worrying about their children's academic achievement from pre-elementary school and many of them put their children into *juku* as early as age three. Japanese children have less time to spend with their parents and fewer chances to engage in activities outside of school because they spend most of the day in school and at *juku* (Dolly, 1993).

Lack of family bonding and parents' under-involvement in children's activities have been implicated in the development of violent behavior among children (Verlinden, 2000). Juvenile crime and delinquency are currently among the most serious social problems in Japan. Recently, serious crimes such as a brutal murder of a family member or teacher, hijacking, and serial killing committed by highly educated children have increased dramatically in Japan. The Japanese Metropolitan Police (2004) reported that one fourth of the criminals who were arrested in 2004 were juveniles (aged 14 to 19). The competitive society in Japan puts great value on academic achievement and many children are suffering under this extreme pressure. The stress of juveniles may be one of the factors that drives youth into crimes and delinquencies.

Taking this incident and increase of brutal juvenile crimes into consideration, the Japanese Juveniles Acts revised its applied age from "older than 16 years old" to "older than 14 years old" in 2001. However, this change has not impacted the rate of juvenile crimes. For example, random attacks on homeless people and strangers committed by young children are still reported daily. As long as it is socially acceptable to judge children only by their academic achievement, Japanese children will continue to experience a lack of freedom and potentially a numbing to the value of life (including animals, other humans, and even themselves).

Evaluating Humane Education as a Prevention of Juvenile Delinquencies and Crimes

The past studies have found that children's aggressive behavior can be taught (Bandura, Ross, & Ross, 1963). Thus, there is reason to think that if physical

aggression can be induced, then it can also be prevented by teaching children strategies to deflect aggressive behavior, such as skills promoting empathic attitudes and behavior (Eisenberg, 1992; Belloso-Curiel, 2002).

Often very young children treat animals in very cruel ways without intending to harm. Ascione (1993) defined cruelty to animals as "socially unacceptable behavior that intentionally causes unnecessary pain, suffering, or distress to and/or death of animal" (p. 2). Attention to the relation between cruelty to animals, or animal abuse, and serious violent behavior has increased in the past two decades. There is a relationship between children who display cruelty toward animals and their later violence against people. Research has consistently found high correlations between adult criminals and histories of animal abuse. For instance, a recent study of school shootings in the United States reported that 45 % of the perpetrators had a history of animal abuse when they were young (Verlinden, 2000). Felthous and Kellert's (1987) data showed that a high percentage of prisoners, 52% of aggressive prisoners, and 17% of the non-aggressive prisoners were cruel to animals when they were young. Felthous and Kellert found that most people who were cruel to animals had histories of impulsive and aggressive behavior in childhood. Such children typically begin by abusing small animals (e.g., insects, fish), and then move on to harming or killing socially valued animals, such as dogs and cats. The original excitement elicited by such horrific acts often fades, which entices these children to target an even more socially valued animal: humans (Ascione, 1999). Such a cycle has often been reported by researchers (e.g., Arkow, 1998; Lockwood & Ascione, 1998).

Because preventing youth violence is one of the most significant issues that Japan faces today, animal abuse committed by young children has gained attention in Japan. Although the competitive style of the Japanese educational system has been proven to cause stress and this stress may be correlated with increased crimes perpetrated by students, few intervention programs have been developed. Nakagawa (1997) stated that humane educational programs and classroom pets help children's moral development, which in turn reduces students' stress levels. However, Nakagawa (1997) pointed out a lack of humane education programs and research in Japan, even though the psychological and social development of children has been shown to benefit from animal contact. Today's Japanese children are less sensitive to nature and their surroundings. Since they are educated from when they are very young and all they have to do is to study hard, Japanese children have fewer opportunities to learn how to interact with diverse people in different settings or how to consider other's feelings. This lack of experience may leave children unprepared to deal with their anger or sadness when they face an unexpected situation.

Dolly (1993) stated that today's Japanese children easily lose their tempers; this tendency is often seen in children who are highly educated and have high expectations for academic achievement placed on them by their parents and teachers. Children are more likely to reduce their aggression level of display when they interact with animals in their early years (Nakagawa, 1997). In addition to reducing their levels of aggression, children will be able to develop the ability to understand their

pets' non-verbal messages, and this ability is linked to human-directed empathy and the ability to understand other's internal states.

Finch (1989) suggested that researchers and educators begin to link humane education to current social problems such as child abuse and delinquency. Milburn (1989) defined humane education as "an attempt to develop altruism and a sense of compassion in a world where all other pressures are in opposition to it" (p. 74). Finch commented, "Humane education has the potential of being one of the most effective ways of teaching empathy toward animals and people. In making such a statement, humane education must dedicate itself to deliberately teaching transference" (p. 68).

Early intervention is critical in the prevention and reduction of aggression in childhood and adolescence. Providing children opportunities to care for animals may encourage children to be mindful to animals, which may serve as a prevention strategy for avoiding cruelty toward animals and perhaps other people in the future. One of the explicit assumptions of humane education programs is "transference", also known as generalization as Finch (1989) referred. Transference suggests that encouraging children to be mindful to animal needs and to treat animals with kindness, will affect the way children will treat other humans (Finch, 1989). Introducing animals to children not only increases their current understanding of non-verbal behaviors but also increases future understanding and empathic behavior toward humans. It is clear that humane education programs aim to enhance interpersonal relations through emphasis on interspecies relations. Thus, introducing children to humane education

and teaching them to care for animals may reduce aggression and maltreatment of animals, and possibly humans.

CHAPTER III: DEVELOPMENTAL THEORY

Developmental Processes and Mechanisms

If taking care of pets impacts children's social, emotional, or cognitive systems, what are the mechanisms or processes that produce these changes? Several developmental theories may be useful in thinking about how to explain changes that result from children's interactions with pets in the classroom. Among these are: Piaget's Constructivist Theory; Vygotsky's Sociocultural-Historical Theory; and Bandura's Social Learning Theory. Each of these perspectives and what they offer the current analysis is discussed below.

Piagetian Cognitive Development Theory

Piaget (1969) has identified four major periods of cognitive development: the sensorimotor stage, the preoperational stage, the stage of concrete operations, and the stage of formal operations. Based on Piaget's theory, second and third graders are expected to be in the preoperational stage and fourth and fifth graders primarily in the concrete operational stage. The main characteristics of preoperational thought are egocentrism, rigidity of thought, semilogical reasoning, and limited social cognition.

Egocentrism implies that children tend to perceive, understand, and interpret the world in terms of the self, and they cannot take another person's perceptual or conceptual perspective. Rigidity and semilogical thought refer to the idea that children in this stage think about the "before" and "after" states but ignore the process, and they focus on appearance rather than reality. As a result, preoperational children are incapable of conservation. Children often fail to distinguish between the certain

properties of objects because they are unable to apply the concept of reversibility. Children in this stage do not possess the cognitive operations that would help them to overcome their perceptually based intuitive reasoning, inability to understand or apply reversibility, transformations, or steps of reasoning (Piaget & Inhelder, 1969). Limited social cognition is exemplified in that children in this stage judge the wrongness of behaviors according to external incidents, such as how much damage was done and whether the act was punished (Miller, 1998). Children in this stage ignore internal variables, such as the person's intentions.

The second and third graders in the current study should be in the preoperational stages and may not be able to generalize their empathic behaviors toward animals to humans. Children in this stage may lack the ability to take another's perspectives. They may not see animals and humans as the same animate creatures that cannot be replaced. Although interacting with animals may stimulate and train children's private speech (Vygotskian view), interacting with animals may not be as effective in promoting preoperational children's perspective taking abilities because they may lack the ability to apply what people feel to what animals feel.

In contrast, children in concrete operational stages (aged 7 to 11) are more successful in applying cognitive operations in thinking about objects, situations, and events that they have seen, heard, or otherwise experienced. Children in this stage have few difficulties in solving problems involving conservation or reversibility. Piaget (1969) suggested that children can apply their operation schemes only to objects, situations, or events that are real or imaginable. Although concrete

operational children are less egocentric than preoperational children, they still have some difficulties with role taking and communication. Concrete operational children are beginning to take intentions into account while making moral judgments and displaying increasing awareness of the subtle social relationships in the family, peer group, and larger society (Miller, 1998).

Following Piaget's theory of cognitive development, fourth and fifth graders in the concrete operational stage are expected to be able to transfer their empathy or concerns toward animals to humans, or humans to animals because they are able to coordinate and apply the relevant schemes involved in the situation. In addition, children in this stage are beginning to learn and develop their concept of social relationships. Introducing concrete operational children to animals during such a sensitive period may produce optimal results in terms of teaching empathic behaviors toward others.

Piagetian Theory of Cognitive Equilibration

Piaget (1969) stressed that children are active and curious explorers who are constantly challenged by a variety of novel stimuli and events that are not immediately understood. He believed that these imbalances between children's modes of thinking and environmental events prompt them to make mental adjustments that enable them to cope with puzzling new experiences and thereby restore cognitive equilibrium. Piaget viewed children's intelligence as being driven by a mismatch between children's internal schemes (existing knowledge) and the external environment, which stimulates cognitive activity and intellectual growth. Piaget described the child as a

constructivist: an organism that acts on novel objects and events and thereby gains some understanding of their essential features. Children's constructions of reality or interpretations of objects and events depend on the knowledge available to them at that point in time. The more immature the children's cognitive system, the more limited their interpretation of an environmental event.

I hypothesize that children's cognitive development can be enhanced by daily interactions with animals. Animals may be a more effective "tool" to assist children in learning empathic behaviors because children have to think and take action by themselves, due to animals' inability to reinforce children with vocal direction. Even when children take care of animals, they will not get a clear response from animals immediately. Therefore, children have to compare animals' reactions from past experience (i.e., existing schemes), compare or match these behaviors, and internalize whether or not their behaviors toward the animal were successful. The children's internal thinking is expected to shape their schemes and enhance their cognitive development.

Vygotsky's Sociocultural-Historical Theory

Vygotsky (1962) asserted that in the process of cognitive development children acquire their culture's values, beliefs, and problem-solving strategies through collaborative dialogues with more knowledgeable members of society. While Piaget stressed children's independent work, Vygotsky (1962) pointed out that more experienced others (e.g., instructors or parents) play a significant role in children's learning process and cognitive development. Through other's guidance, children first

understand the instruction and eventually internalize this information, applying it to regulate their own performance. Children learn by actively participating in culturally relevant activities with more skilled partners who provide necessary help and encouragement. A main goal of this scaffolding is to shift the regulation of activity from the tutor to the child. As children interact with adults or more capable peers whose ability is slightly ahead of them, they not only gain new information but learn how to think. Although Rogoff (1990) emphasized that tutors should not explicitly instruct children in face-to-face interaction, children can learn from skilled tutors at a distance by observing everyday activities without any intention to teach children on the tutor's part. Observing other's caring behaviors will assist children in adapting their understanding to new situations, structuring problem solving attempts, and assisting them with assuming responsibility for managing problem solving (Rogoff, 1990).

By providing animals in the classroom, students will have more opportunities to engage in the same activities with other peers (e.g., cleaning the cage). As Johnson and Johnson (1989) claimed, cooperative learning is effective for children in promoting their cognitive development and social skills. Children are often more motivated when they are working through a problem with other peers. In cooperative learning, children have to explain their own ideas to others and to resolve conflicts. These experiences help children to examine their own ideas more closely and to become better at expressing them so that they can be understood.

In addition to the importance of guidance and participation, Vygotsky emphasized the importance of cultural influences. Although Piaget claimed children's development is universal, Vygotsky addressed children's differences across the world. Different cultures emphasize different kinds of tools, skills, and social interaction because of different cultural needs and values (Miller, 1998). The Japanese culture values social ties and dependency, whereas American culture values autonomy and independence (Miller, 1998). It is expected that guided participation would be more effective for Japanese children who have been taught to value social ties and dependency. Regardless of culture, however, introducing animals into the classroom setting is expected to be influential on children's development of empathic skills and cognitive thinking skills.

Bandura's Social Learning Theory

The social learning theory of Bandura emphasizes the importance of observing and modeling other's behaviors and attitudes. Social learning theory explicates human behavior in terms of a continuous reciprocal interaction between behavioral, cognitive, and environmental determinants (Bandura, 1977). Researchers have found that young children's empathy is associated with age (Borke, 1973), yet Bandura's reciprocal interaction also expects to see influence outside of age in developing empathy. Providing children an opportunity to interact with animals may provide a key influence on the development of children's empathy.

For instance, Bandura, Grusec, and Menlove (1967) reported on children interacting with a dog after they observed their peers playing with it. This finding

shows that observing peers can facilitate the acquisition and modification of children's activities. Additionally, similarity between the model's and the observer's age increases the effectiveness of the model (Bandura, Ross, & Ross, 1963). Bandura (1977) explained that generalization can be processed more easily when models are similar to observers. In further support of this assertion, Owens and Ascione (1990) found that children (third, fourth, and fifth graders) were more likely to imitate models belonging to a similar age group than an adult age group. In addition, these children were more likely to imitate prosocial behaviors of models that were familiar and preferred.

Given the above research findings, I expect that children who interact with animals in a school setting among same age classmates are more likely to successfully develop empathy than children who only interact with a pet at home. By observing other classmates who have knowledge of caring for pets, children can facilitate their caring behaviors by imitating peers' behaviors. Taking care of an animal with their classmates will teach children the right way of handling animals and this may promote children's empathic behaviors toward animals. Thus, it is expected that the learning experiences with animals will help children to be more kind to humans.

However, social learning theory could also suggest that children might also imitate other children's undesirable behaviors (e.g., torturing animals). There may be a need for adjustment or consideration where the classroom pets need to be placed (e.g., place the pet where everyone can closely monitor) in addition to teachers' guidance toward those students' negative behaviors.

Current Research Questions

As mentioned at the beginning of this paper, the purpose of this study is to investigate whether animals are effective in promoting the development of children's empathic behaviors and attitudes and whether children's empathy toward animals will generalize (transfer) to humans. Additionally, we seek to identify whether Japanese children will demonstrate the same benefits that were found in past humane education research with U.S. children. For the purpose of this study empathy is defined as an increased frequency of thinking about how another might think, feel or act.

Research on animals in the classroom setting has been minimal across the nations; therefore, the current research will also serve as a component for cross-cultural research in the future as the study will later be replicated with data from the US (to be collected in 2005). Although the previous US studies found significant positive influences from humane education on children's empathic behaviors towards animals and humans, they were only provided traditional humane education programs, which did not include everyday animal and child contact (i.e., Vockell & Hodal, 1980; Fitzerald, 1981; Ascione, 1992). Fitzgerald (1981) found that children in an intensified humane education program (long-term humane education program) significantly improved participants' scores on humane attitudes toward animals over and above improvements found with children who received traditional humane education. The current study is based on a study conducted by Ascione in 1992, however I focused on how intensified daily interactions with living animals, compared to a traditional humane education program without any animals, influenced children's

empathic skills. I also identified whether there were age, and/or gender differences in children's empathic skills.

The Younger Students

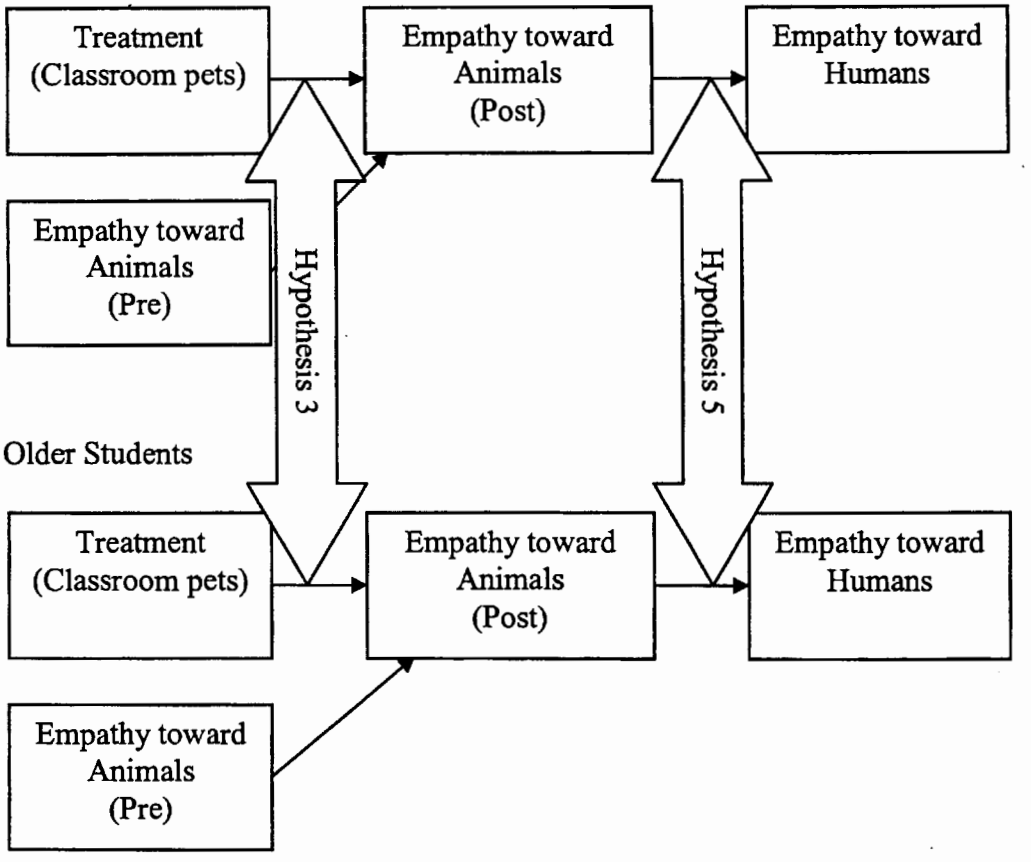

Figure2 Diagram for the study hypotheses

At-Home Exposure to Animals during the Early Stage

Children who have had experiences with pets at home might show different scores on measures of Primary Attitude Scale (PAS) or Intermediate Attitude Scale (IAS) than children who have not had experience with pets at home. Social learning theory would predict that having pets at home could influence the learning of empathy

for second, third, fourth, and fifth grades; in other words social learning theorists would not anticipate age or developmental differences. Piagetian theory, on the other hand, would predict that having pets at home might encourage decentering and perspective-taking. The current study follows predications that could be made when applying Piagetian theory: 1) The older students (fourth and fifth graders) with pets should show higher scores than the younger students (second and third graders) with pets on PAS and IAS; and 2) Among the younger students, those with prior experience caring for pets at home would score much higher on surveys assessing humane attitudes toward animals.

Hypotheses of Current Study

Given the research questions discussed previously, the following hypotheses were constructed.

Hypothesis 1: There will be no significant group differences between the experimental group (E group) and the control group (C group) for the younger students (second and third graders) on scores of empathy measurements (PAS, IAS, and Fireman Test) both in the pre-test and the post-test.

Hypothesis 2: Students in the older (fourth and fifth graders) experimental group (E group) will score significantly higher on empathy measurements than the older students in the control group (C group) in the post-test while there will be no score difference across the group in the pre-test.

Hypothesis 3: The classroom mean scores of the older students (fourth and fifth graders) on empathy measurements will show significant improvement from the

pre-to the post-tests while the younger students (second and third graders) will not show change in scores from the pre to the post tests.

Hypothesis 4: The classrooms mean scores in the post-test for the classrooms with pets (experimental group: E group) on the empathy measurement (PAS, IAS, and Fireman Test) will significantly increase from pre-test, while the control group (C group) will show little change in scores.

Hypothesis 5: The experimental group's post-test Primary Attitude Scale (PAS) and Intermediate Attitude Scale (IAS) scores will be significantly positively correlated to higher scores on the Bryant's Index of Empathy, while no significant correlations will be observed between the same measures for the control group. Specifically, correlations of the older students will be significantly higher than correlations of the younger students. This will provide an estimate of whether increases in empathy toward animals generalize to or is associated with higher empathy toward people.

CHAPTER IV: METHOD AND PRECEDURE

Overview

In order to examine how pets in the classroom would affect children's empathic skills, stakeholders and I invited nine elementary classrooms in Japan to participate in the study. Students were grouped into "the younger students" (second and third graders) and "the older students" (fourth and fifth graders). To examine the impact of animals, we divided the participants into two groups: the experimental group (E group) and the control group (C group). Guinea pigs were introduced into the E group classrooms, while C group did not receive any special curricula, such as humane education programs. The academic year of Japanese elementary school starts in April and ends in March. Thus, surveys were collected at the beginning of the program (May, 2003) and again at the end (March, 2004) to examine changes of students' empathy development.

The surveys were designed to measure children's humane attitudes toward animals and humans. The survey instruments have previously been validated by other researchers and consisted of both quantitative and qualitative measures. Results were compared regarding the amount of children's development in empathy throughout the year. In addition to students' surveys, teachers of E group also completed surveys designed to assess how teachers perceive students' changes during the program. Throughout the study, the E group occasionally received traditional humane education with veterinarians, learning how to care for animals and about animal life.

An analysis of variance was conducted to assess the impact of presence/absence of a classroom pet on children's attitudes toward animals and humans. Gender, experience with animals, and attendance to other schools in addition to the elementary school were also entered as factors in the analyses along with grade level (cross-sectional comparison).

Participants

Participants consisted of 366 second graders, 77 third graders, 29 fourth graders, and 381 fifth graders from 9 different elementary schools in Japan. In the post-test, 386 second graders, 74 third graders, 27 fourth graders, and 387 fifth graders from 9 different elementary schools were returned the survey. Male and female students were equally represented in the sample. Because having an animal inside of the classroom is relatively new idea in Japan, support and understanding from school, teacher, and parents were required (e.g., pets may cause some problems for students with allergies). In addition, researchers investigated each experimental classroom to make sure they were qualified to have an animal inside of the classroom and to take care of it for a year. Only qualified schools where teachers volunteered were provided with an animal for the classroom. Participants were not completely randomly selected and the research sample consists of selected convenience samples. In addition to these two groups (E group and C group), two classes (two classrooms from second graders and one classroom from fifth graders) filled out the survey to assess test-retest reliability of the Background Information Survey that was developed for this study.

They retook the same questionnaire two weeks after they took the questionnaire at the first time.

Animals

Each experimental classroom was provided with two or three guinea pigs to be kept inside of the classroom throughout the academic year. The animals used in the study were brought from the school-pet organization (most Japanese elementary school buy school pets from this organization) and were fully vaccinated. The Japanese Veterinarian Association provided supervision and medical care of the pets during the program and took custody of the animals after its completion.

One of concerns that schools face in encouraging children to interact with animals is the treatment of children who had allergies to animals. Although humane education or introduction of a classroom pet should be equally beneficial to all students, the restriction or rules for students who have allergies to animals should be made clear to prevent development of students' negative attitudes or feeling toward animals. The US Environmental Protection Agency recommends one way to minimize any ill effects on students is to locate the animals in one part of the classroom and keep the area clean (Sack, 2003). In the current study, we recommended that students with allergies to animals use gloves and masks when they physically interacted with a classroom pet. Although necessary allergic treatment and appropriate advice were given, we encouraged all students in the E group to interact (physically or non-physically) with animals regardless of their allergic background.

Measures

Participants completed a set of questionnaires that consisted of a Primary Attitude Scale (for second and third graders), Intermediate Attitude Scale (for fourth and fifth graders), Billy and the Fireman Test, and the Background Information Survey, at the beginning of the program and at the end of the program. Bryant's Index of Empathy survey was also given at the post-test period. See appendices B, C, D, E, F & G. Additionally, teachers (of the E group) scored each student's engagement level and replied to relevant questions about student's behavior changes throughout the program. See appendices H & I.

For each analysis, the main independent variables were treatment (experimental [E] or control [C]), age group (the younger students: second and third graders, the older students: fourth and fifth graders.) and gender.

Primary Attitude Scale (PAS)

This questionnaire was developed by Ascione to evaluate first and second grade children's humane attitude and treatment of animals. The scale consists of 23 items with "*Yes*" or "*No*" response format. More humane responses are scored as 2 points and the less humane response is scored as 1 point. Scores range from 23 to 46. The PAS has been previously validated by Ascione in 1992 (Coefficient alpha was .63). Example questions are: 1) "Do dogs hate to sit in a car with the window closed when it's really hot outside?"; 2) "Do you think that you would like to be a person who takes care of animal when you grow up?"; and 3) "Do you think animals need laws to protect them?"

Intermediate Attitude Scale (IAS)

This questionnaire was developed by Ascione to evaluate third, fourth, fifth, and sixth grade children's humane attitude and treatment of animals. The scale consists of 36 items with 4-Likert scale ranging from "*Strongly Agree*" to "*Strongly Disagree.*" More humane response received score of 4 and less humane response receives a score of 1 point. Scores range from 36 to 144. This version of the PAS was validated also by Ascione in 1992 (Coefficient alpha was .69). Samples questions are: 1) "All cats like to be take on trips"; 2) "People should not try to make wild animals become pets"; and 3) "There are good things about all animals even those I don't like."

Billy and the Fireman Test

This questionnaire was developed by Vockell and Hodal (1980) to assess children's attitudes toward animal life. Children are told that the house of a boy who is about the same age as they are is now on fire. The fireman has told the boy that his house would be totally burned down, and he could save only three things from his house before house would be totally lost. Students are given a list of ten objects in house (i.e., cats, dogs, computer, bankcard) and have to choose three of them that they think the boy in this story should save. Students who chose animals to save received score of one for each animal, thus scores range 0 to 3. The rationale behind this instrument is that a person with favorable attitudes toward animal life will choose the animals, since they cannot be replaced. This instrument has been validated in another technical report (Vockell 1979).

Background Information Survey

This survey was developed by Maruyama and Nakagawa for the current study in 2002. The background information survey aims to assess students' daily activities, family formation, experience with home pets, and relationships with friends, siblings, teachers, and neighbors. Subsequently, the older students were asked whether they had been a perpetrator or an eyewitness of animal abuse. Lastly, four questions to assess students' moral reasoning assessment questions were added. All students were asked how they would react if they saw: 1) their friend; 2) a school pet; 3) a wandering animal on the street; or 4) their home pet attacked by strangers. The younger students have four choices to choose: 1) "I would help him/her even if I were alone"; 2) "I would go to get a teacher or an adult"; 3) "Even though I feel sorry for him/her, I would pretend not to notice it because I don't want to fight with my friend"; or 4) "I would not help because it's none of my business". And the older students have five choices: 1) "I would help him/her even if I were alone"; 2) "I would go get a teacher or an adult"; 3) "Even though I feel sorry for him/her, I would pretend that I did not notice it because I would be scared"; 4) "I would help only if people who were attacking were small in number and looked weaker than me"; or 5) "I wouldn't help him/her because it's none of my business." Coefficient alpha was .82 (See Appendix J). Other sample questions in the Background Information Survey include: 1) "How often do you attend any other schools besides elementary school?"; 2) "Do you think you are a shy person?"; 3) "How often do you play with your brother and/or sister?"; 4) "Have you treated animal (e,g., dogs, cats, and rabbit) cruelly (hitting or kicking)?";

and 5) "What would you do if you saw some people attacking a wandering animal (e.g., cat, dog) outside?"

Index of Empathy

This questionnaire was developed by Bryant to assess children's empathy toward humans. The scale consists of 22 items with yes-no response. More empathic response received score of 2 and less humane response receives a score of 1 point. Coefficient alphas were reported to range from .54 to .79. Samples questions are: 1) "It makes me sad to see a girl who can't find anyone to play with"; 2) "People who kiss and hug in public are silly"; 3) "Boys who cry because they are happy are silly"; 4) I really like to watch people open presents, even when I don't get a present myself"; and 5) "Seeing a boy who is crying makes me feel like crying."

Teachers' Questionnaire

Teachers in the experimental classrooms were asked to fill out the feedback survey at the end of the program. Teachers were asked to rate (5-Likert scale) each student's observable changes throughout the program and their own attitude toward the program (Open-ended questionnaire). Sample questions are: 1) "Having a classroom pet was beneficial to my students"; 2) "Having a classroom pet was a lot of extra work and was not worth to have"; 3) "I would like to have a classroom pet next year too"; 4) "Having a classroom pet only beneficial to a small number of students"; 5) "What were the most difficulties to have a classroom pet?" (Open-ended); and 6) "What was the most benefit having a classroom pet?" (Open-ended).

Teacher's Questionnaire: Student Rating

Teachers in the experimental classrooms were asked to rate each student's observable behavior changes throughout the program. Sample questions are: 1) "What were the engagement levels when this student had a classroom pet *at the beginning*?"; 2) "What re the engagement levels *now*?"; 3) "How often did this student show empathic behaviors toward the classroom pet *at the beginning"*; 4) "How often does the student show empathic behaviors toward the classroom pet *now*?"

Procedure

The stakeholders (The Non-Profit Organization (NPO) Knots, School board in Kobe Japan, Ochanomizu University, Japan, Principal of Japanese School Pet Organization, and the Japanese Veterinarian Association) and I selected nine elementary schools across Japan. Selection of the experimental classrooms groups was based on whether volunteer veterinarians, who would aid in the research, lived close to the schools.

Informed consent forms were obtained at the beginning of the study from students' classroom teachers and each school's principals. (See appendix A). This letter informed participants, school principals, teachers, and parents of the purpose of the study and of the rights of the participants in the study. Students were informed of the voluntary nature of questionnaires. Parent/guardian consent was not collected because asking parents/guardians to complete such a form is considered inappropriate in Japan. Customarily, researchers in Japan only ask parents/guardians to sign informed consent forms when there is a strong possibility that the research may cause

significant physical harm or death. Therefore, asking parents/guardians to sign such a form is likely to cause considerable unease. Rather than collecting consent forms from parents/guardians, the local school board was responsible for protecting the safety and well-being of students who participated. The school board reviewed all the study materials to ensure that all procedures and materials were appropriate.

As a result, all schools that were approached with a request to obtained informed consent forms from parents/guardians refused to participate. In recognition of the different requirements and research traditions in the United States, the school principals and classroom teachers agreed to fill out consent forms permitting students' participation. Participants' parents/guardians were informed about the procedures and questionnaires relating to this project. Researchers and the veterinarian met with children's parents in order to explain the project. Finally, parents were encouraged to ask questions and contact researchers at any point during the time of study if they had any questions.

Pre-Existing Differences

Before I analyzed the results for the research hypotheses, I investigated students' possible pre-existing differences on empathy measures before the program was implemented. The study found that there were a few pre-existing differences between the experimental and control groups before the program was implemented, and that these pre-existing differences needed to be considered when the research hypotheses were analyzed. All significant differences across the E and C groups in the pre-test are presented here.

Primary Attitude Scale (PAS)

The Primary Attitude Scale (PAS) was employed in order to assess the younger students' humane attitudes towards animals. A two-way factorial analysis of variance (ANOVA) was conducted to evaluate the treatment effects on the younger students' scores in the pre-test. Additionally, home pet ownership (Home pet) and having siblings (Sibling) were also investigated as factors.

The ANOVA indicated a significant main effect for the Treatment in the pre-test, $F(1, 380) = 9.32$, $p < .01$, partial $\eta^2 = .02$. The younger students in the E group ($M = 41.25$, $SD = 2.21$) scored significantly higher than the younger students in the C group ($M = 39.77$, $SD = 2.46$) on PAS in the pre-test. In addition, the main effect for Gender was significant, $F(1, 380) = 11.47$, $p < .01$, partial $\eta^2 = .03$. Female students scored significantly higher than male students on PAS in the pre-test (See Table 1 for means and standard deviations). Therefore, there were pre-existing differences across the group (E-C groups) before the treatment was implemented.

Intermediate Attitude Scale (IAS)

The Intermediate Attitude Scale (IAS) was employed in order to assess the older students' humane attitudes towards animals. A two-way factorial analysis of variance (ANOVA) was conducted to evaluate the treatment effects on the older students' score on IAS in the pre-test. No significant differences were found for the experimental vs. control groups in the pre-test. Also, no main effects for Gender,

having siblings (Sibling), home pet ownership (Homepet), or interactions between the variables were found.

Billy and the Fireman Test (Fireman Test)

The Younger Students (Second and Third Graders)

A two-way factorial analysis of variance was conducted to evaluate the effects of taking care of pets in the classroom treatment (E group) on the younger students' score on the Fireman Test in the pre-test. The ANOVA indicated a significant main effect for Treatment in the pre-test, $F(1, 377) = 6.06$, $p < .05$, partial $\eta^2 = .02$. The younger E group students ($M = 1.62$, $SD = 1.14$) scored significantly higher than the C group students ($M = 1.30$, $SD = 1.07$) on Fireman test in the pre-test. There were no other significant main effects (Homepet, Sibling), and no significant interactions (Treatment x Gender, Treatment x Home Pet, and Treatment x Sibling) were found.

The Older Students (Fourth and Fifth Graders)

The ANOVA indicated that the main effect for the older Treatment group on the Fireman Test was not significant in the pre-test, (E group $M = 1.97$, $SD = 1.13$; C group $M = 2.04$, $SD = 1.12$), $F(1, 421) = .36$, $p = .55$. However, the main effect for Gender was significant, $F(1, 421) = 19.71$, $p < .001$, partial $\eta^2 = .05$. Older female students scored significantly higher than older male students on the pre-test Fireman Test (See Table 4 for means and standard deviations). The main effects for Home pet and Sibling were not significant, and no significant interactions were found in the pre-

test. Thus, while there was a gender difference existing prior to the treatment, the study did not find any other pre-existing differences before the study.

Background Information Survey

The Background Information Survey assessed students' daily activities, family formation, experience with home pets, and relationships with friends, siblings, teachers, and neighbors. Subsequently, the older students were asked whether they had been a perpetrator of animal abuse in order to investigate whether the treatment program could serve as an intervention strategy for animal abuse. Lastly, four questions were given to assess students' moral reasoning. Two-way contingency table analyses were conducted to evaluate whether students' background was different across the groups (E group and C group).

In the younger students (second and third graders), there were no significant differences between the E and the C groups on questions about activities outside of schools, pet ownership, and family structure in the pre-test background information survey.

However, in the older students (fourth and fifth graders), differences were found between the E group and C group in the pre-test time period. In the pre-test, the older E group students were more likely to interact with elderly people (Always/often/sometimes help/talk to elderly people = 86.9 %) than the C group students (Always/often/sometimes help/talk to elderly people = 73.7 %), $\chi^2(1, N = 437) = 7.46, p < .01$. There were no other significant differences between the groups in the pre-test.

Moral Reasoning Development

In order to assess whether students would be more likely to show development in their moral reasoning, four questions were asked. All students were asked to choose one option of how they would react if they saw 1) their friend, 2) a school pet, 3) a wandering animal on the street, or 4) their home pet attacked by strangers.

In the younger students' pre-test, the E group students were significantly more likely to help wandering animals on the street (Help alone = 76.6 %) than the C group students (Help alone = 54.7 %), $\chi^2(3, N = 438) = 17.99, p < .001$. In the older students' pre-test, the E group students were significantly more likely to help classroom/school pet (Help alone = 62.2 %) than the C group students (Help alone = 43.3 %), $\chi^2(4, N = 404) = 9.53, p < .05$.

These pre-existing differences need to be considered when the readers read the hypothesis analyses in the post-test, which is presented below.

CHAPTER V: ANALYSIS OF DATA

Process of Data Coding

After I collected all the surveys from each elementary school in Japan, the surveys were coded into SPSS version 11.5 by four trained undergraduate research assistants who were all native Japanese speakers. Each research assistant was paired with another research assistant and the two assistants coded the same data. After the research assistants finished coding the data, they matched their own data entries with their partner's in order to check for accuracy. All data entries were matched, thus minimizing mis-entry of data by assistants.

Missing Data

Although the stakeholders encouraged students to answer all questions, some students skipped questions on surveys. In order to obtain as much accurate data as possible, I employed a mean imputation technique for these randomly missing data. The mean imputation technique estimated the missing values by using predicted values gained from existing data. If students did not answer 30 percent of the survey or answered questions in a certain pattern (e.g., chose "*Yes*" for all questions or made one circle for 20 questions), I employed listwise deletion.

Data analyses

The students were divided into two groups accordingly to Piaget's cognitive developmental theory. Students were put into either the "younger students" (second and third graders who were considered to be predominantly in the Piaget's preoperational stage or concrete operational stage) or the "older students" (fourth and

fifth graders who were considered to be in the concrete operational stage). The dependent variables were students' scores on empathy measurement (PAS, IAS, Fireman Test, and Index of Empathy). First, I will report the analysis of research hypothesis analysis, then I will report the meaningful findings from background information surveys.

Because the nature of the study assured participants anonymity to reduce potential socially desirable responses, the study could not match individual scores from the pre-test to the post-test. Therefore, detailed statistical analyses were performed separately on the pre-test and the post-test data, then we treated the classroom as the unit of analysis in order to compare the classroom's pre/ post attitudinal changes. Analyses for the effects of having versus not having a classroom pet were performed for groups of students according to their age or level of cognitive development. Hypothesis 1 and 2 were specifically constructed in order to compare the individual score differences in the pre-test and the post-test. Hypothesis 3 and 4 were constructed in order to compare the classroom mean score improvement across the study. For each hypothesis, I will present the results from the post-test for the younger experimental and control group students, then the analysis results of the older students in the post-test. All pre-existing differences before the treatment was implemented (i.e., significant differences found in the pre-test) were discussed the previous section "Pre-Existing Differences."

Analyses of Hypotheses

The main independent variables were Treatment (Experimental [E] or Control group [C]) and Gender (Male or Female). Having a pet at home or not (Home Pet) and having a sibling(s) or not (Sibling) were additionally employed in the pre-test as independent variables to investigate whether there were preexisting differences among students' scores on empathy measurements before the program was implemented as a result of having experiences with siblings or pets at home. The dependent variables were the scores on empathy measurements (Primary Attitude Scale, Intermediate Attitude Scale, Billy and the Fireman Test, and Index of Empathy). The Primary Attitude Scale (PAS) was used for measuring the younger students' humane attitude toward animals, and Intermediate Attitudes Scale (IAS) was used for the older students. The difference between PAS and IAS was the number of items and the way each question was modified to make them age appropriate. The format for Billy and the Fireman Test and Index of Empathy was the same for each age group in the study.

Individual as a Unit of Analysis

In order to test hypothesis 1 and 2, the study examined the pre-post empathy scores for the experimental and control groups as measured by the PAS, IAS, and the Fireman Test. Analyses of the pre-test and the post-test were performed separately to reveal the individual student's empathy score differences for the each test.

Hypothesis 1: There will be no significant group differences between the experimental group (E group) and the control group (C group) for the younger students (second and third graders) on scores of empathy measurement (PAS, IAS,

and Fireman Test) both in the pre-test and the post-test.

Hypothesis 2: Students in the older (fourth and fifth graders) experimental group (E group) will score significantly higher on empathy measurements than the older students in the control group (C group) in the post-test while there will be no score difference across the group in the pre-test.

Primary Attitude Scale (PAS)

The Primary Attitude Scale (PAS) was employed in order to assess the younger students' humane attitude toward animals. The scale consists of 23 items with a "*Yes*" or "*No*" response format. More humane responses are scored as 2 points and the less humane response is scored as 1 point. Thus, scores range from 23 to 46.

A two-way factorial analysis of variance (ANOVA) was conducted to evaluate the treatment effects on the younger students' scores in the post-test. The main effect (Treatment) and the interaction effect (Treatment x Gender) were tested using the multivariate criterion of Wilks' lambda (Λ). The first hypothesis asked if there are significant group differences between the younger (second and third graders) experimental (E group) and the control (C group) group students on scores of empathy measurement (PAS, IAS, and Fireman Test) in the post-test.

The ANOVA indicated a significant main effect for the Treatment, $F(1, 417) = 74.53$, $p < .001$, partial $\eta^2 = .15$. The younger students in the E group ($M = 41.52$, $SD = 1.87$) scored significantly higher than the younger students in the C group ($M = 37.83$, $SD = 3.89$) on PAS in the post-test (See Table 1 for means and standard

deviations). However, the main effect for Gender was not significant, F (1, 417) = 2.26, p = .13, partial η^2 = .01. Interaction between Treatment and Gender was also not significant, F (1, 417) = .04, p = .83, partial η^2 = .00.

Because the study found that the main effects for the Treatment and Gender in the pre-test was also significant, findings in the post-test will not support the hypothesis 1. The main effect for Home Pet and Sibling were not significant, F (2, 380) = 2.00, p = .12, partial η^2 = .01, F (1, 380) = .03, p = .85, partial η^2 = .00.

Table 1 *Means and Standard Deviations of Primary Attitude Scale (The younger students: Individual as a unit of analysis)*

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
E group	40.54 (2.56) n = 32	41.78 (1.76) n = 43	41.25 (2.21) n = 75	41.12 (1.97) n = 40	41.84 (1.73) n = 51	41.52 (1.87) n = 91
C group	39.36 (2.63) n = 164	40.19 (2.21) n = 166	39.77 (2.46) n = 330	37.56 (3.92) n = 165	38.10 (3.85) n = 165	37.83 (3.89) n = 330

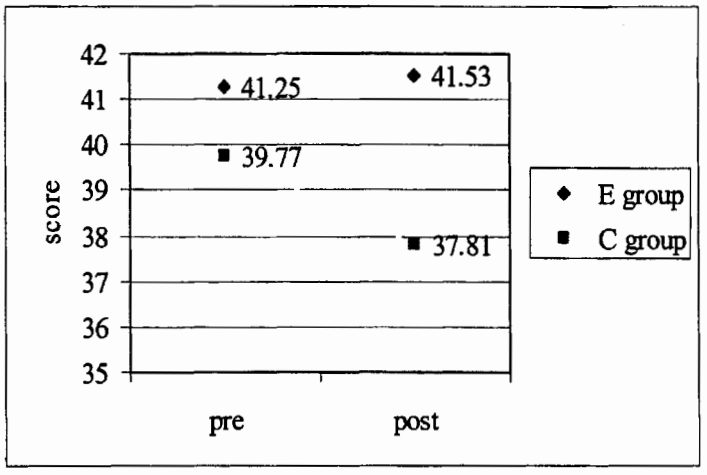

Figure 3 Mean Pre-test and Post-test Scores of Primary Attitude Scale (Individual as a unit of analysis)

The Intermediate Attitude Scale (IAS) was employed in order to assess the older students' humane attitude toward animals. The scale consists of 36 items ranging from "*Strongly Agree*" to "*Strongly Disagree.*" Most humane response received a score of 4 and least humane response receives a score of 1 point. Thus, scores range from 36 to 144.

A two-way factorial analysis of variance (ANOVA) was conducted to evaluate the treatment effects on the older students' scores on IAS in the post-test. The main effect (Treatment) and the interaction effect (Treatment x Gender) were tested using the multivariate criterion of Wilks' lambda (Λ).

The second hypothesis predicted older (fourth and fifth graders) experimental group (E group) students would score significantly higher than the older control group (C group) students in the post-test, but that while would be no score differences across the group in the pre-test.

As predicted, the ANOVA indicated that the main effect for Treatment was significant in the post-test, $F(1, 439) = 9.29, p < .01$, partial $\eta^2 = .02$. The E group students ($M = 101.63$, $SD = 7.60$) scored significantly higher than the C group students ($M = 98.53$, $SD = 9.05$) on IAS in the post-test. Additionally, the main effect for Gender was also significant, $F(1, 439) = 21.82, p < .001$, partial $\eta^2 = .05$. Female students scored significantly higher than male students did on IAS in the post-test (See Table 2 for means and standard deviations). Because the main effects (Treatment and Gender) were not significant in the pre-test, this finding will support the hypothesis 2. The interactions between Treatment and Gender were not significant in the post-test, $F(1, 439) = 1.40, p = .24$, partial $\eta^2 = .00$.

Table 2

Means and Standard Deviations of Intermediate Attitude Scale (The older students: Individual as a unit of analysis)

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
E group	98.56	102.27	100.42	98.79	104.41	101.63
	(7.19)	(6.63)	(7.13)	(7.65)	(6.51)	(7.60)
	$n = 52$	$n = 52$	$n = 104$	$n = 51$	$n = 52$	$n = 103$
C group	101.12	102.93	101.94	97.00	100.35	98.53
	(8.91)	(8.47)	(8.75)	(10.11)	(7.21)	(9.05)
	$n = 187$	$n = 154$	$n = 341$	$n = 185$	$n = 155$	$n = 340$

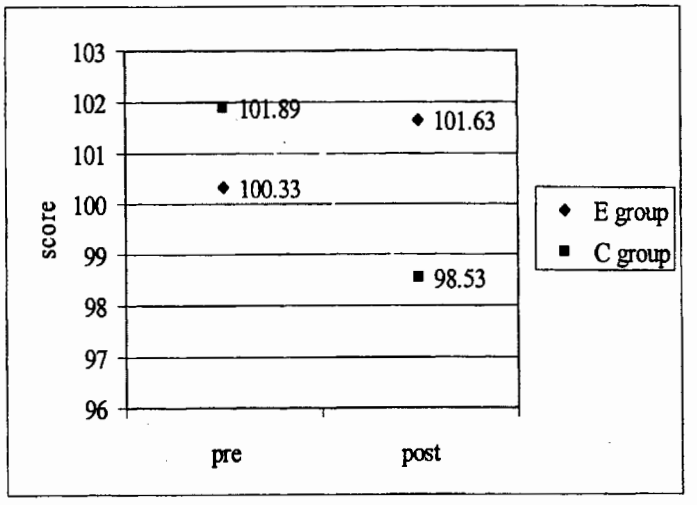

Figure 4 Mean Pre-test and Post-test Scores of Primary Attitude Scale (Individual as a unit of analysis)

Billy and the Fireman Test (Fireman Test)

The Billy and the Fireman Test (Fireman Test) was employed in order to assess students' humane attitudes toward animals' life. Students are given a list of ten objects in house (i.e., cats, dogs, computer, bankcard) and had to choose three that they think the boy whose house was burning down should save from the fire. Students who chose to save animals received a score of 1 for each animal, thus scores range from 0 to 3.

The Younger Students (Second and Third Graders)

A two-way factorial analysis of variance was conducted to evaluate the effects of taking care of pets in the classroom treatment on the younger students' score on the Fireman Test in the post-test. The main effect (Treatment) and the interaction effect (Treatment x Gender) were tested using the multivariate criterion of Wilks' lambda

(Λ). Factors were Treatment and Gender, and the dependent variable was the score on the Fireman Test

The ANOVA indicated that the main effect for the Treatment in the post-test was not significant, $F(1, 415) = 3.00, p = .84$. However, the main effect for Gender was significant, $F(1, 415) = 5.24, p < .01$, partial $\eta^2 = .03$. Female students scored significantly higher than male students did on this measure of valuing the life of animals (See Table 3 for means and standard deviations). The interaction between Treatment and Gender was not significant, $F(1, 415) = 1.47, p = .23$, partial $\eta^2 = .00$.

However, because the study found the significant main effects for the Treatment in the pre-test (discussed in the "Pre-existing Differences"), the study cannot rule out the pre-existing differences of the younger students' humane attitude toward animals measured by the Fireman Test.

Table 3

Means and Standard Deviations of Billy and the Fireman Test (The younger students: Individual as a unit of analysis)

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
E group	1.58 (1.34) $n = 31$	1.65 (1.10) $n = 43$	1.62 (1.14) $n = 74$	1.77 (1.11) $n = 39$	2.00 (.99) $n = 54$	1.90 (1.04) $n = 93$
C group	1.14 (1.02) $n = 163$	1.45 (1.10) $n = 166$	1.30 (1.07) $n = 329$	1.39 (1.13) $n = 162$	1.93 (1.08) $n = 164$	1.67 (1.13) $n = 326$

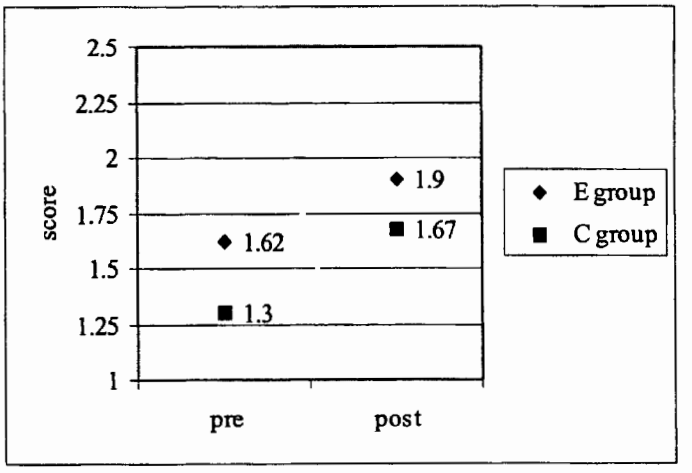

Figure 5 Mean Pre-test and Post-test Scores of Billy and the Fireman Test (The younger students: Individual as a unit of analysis)

The Older Students (Fourth and Fifth Graders)

A two-way factorial analysis of variance was conducted to evaluate the effects of treatment on the older students' score on the Fireman Test in the post-test. The main effect (Treatment) and the interaction effect (Treatment x Gender) were tested using the multivariate criterion of Wilks' lambda (Λ). Factors were Treatment and Gender, and dependent variable was the score on the Fireman Test.

The ANOVA indicated that the main effect for Treatment was not significant in the post-test, $F\,(1, 439) = .08, p = .78$. However, the main effect for Gender was significant, $F\,(1, 439) = 31.29, p < .001$, partial $\eta^2 = .13$. Female students scored significantly higher than male students did on the Fireman Test (See Table 4 for means and standard deviations). There were no significant interactions between Treatment and Gender.

Table 4

Means and Standard Deviations of Billy and the Fireman Test
(The older students: Individual as a unit of analysis)

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
E group	1.50 (1.15) $n = 52$	2.44 (.90) $n = 52$	1.97 (1.13) $n = 104$	1.41 (1.12) $n = 49$	2.57 (.79) $n = 53$	2.01 (1.12) $n = 102$
C group	1.85 (1.18) $n = 191$	2.28 (.98) $n = 150$	2.04 (1.12) $n = 341$	1.72 (1.20) $n = 183$	2.32 (.91) $n = 157$	1.99 (1.12) $n = 340$

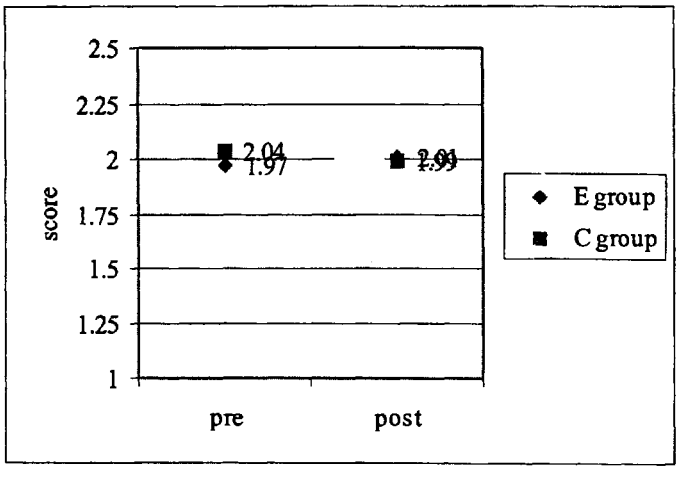

Figure 6 Mean Pre-test and Post-test Scores of Billy and the Fireman Test
(The older students: Individual as a unit of analysis)

Although the study hypothesized that there would be no significant differences on empathy scores among the younger students (hypothesis 1), while students in the older E group will score significantly higher than the older students in the C group in

the post-test while there would be no score difference across the groups in the pre-test (hypothesis 2), findings from the analyses with individual as a unit of analysis indicates that the post-test score of both the younger and the older E group students were significantly higher than the C group post-test score. Specifically, female students regardless of groups (E or C groups) tended to score higher than male students on empathy measurement. The analysis also found that having a pet at home or having siblings were not significant factors on students' score on empathy measurements. Findings were more complex for the younger students as the pre-test scores on empathy measures were significantly higher for the E group, some ambiguity in interpreting the results. As expected, the E group significantly scored higher than the C group both at the pre-test and the post-test. However, average score for the C group in the post-test dropped, while the only minimal changes were found in the E group. These findings will be discussed in more detail in the next section.

Classroom as a Unit of Analysis

Following to the analyses "individual as a unit of analysis", I explore whether treatment lead to differences in students' empathy as measured by the PAS, IAS, and the Fireman Test to compare the classroom's pre-post attitudinal changes. Thus, the following analysis treated the classroom as a unit of analysis.

Hypothesis 3: The classroom mean scores of the older students (fourth and fifth graders) on empathy measurement will show significant improvement from the pre-to the post-tests while the younger students (second and third graders) will not show change in scores from the pre to the post tests.

Hypothesis 4: The classrooms mean scores in the post-test for the classrooms with pets (experimental group: E group) on the empathy measurement (PAS, IAS, and Fireman Test) will significantly increase from pre-test, while the control group (C group) will show little change in scores.

A two-way mixed factorial analysis of variance was conducted to evaluate the treatment effect on students' empathy score measurements (PAS, IAS, and the Fireman Test) from the pre-test time period to the post-test time period for the two groups (E group and C group). Factors were Treatment and Gender, and the dependent variable was the score on the empathy measurement (PAS, IAS, Fireman Test). The main effect (Pre- versus post-test score), and the interaction effects (Pre- versus post-test score x Gender; Pre- versus post-test score x Treatment) were tested using the multivariate criterion of Wilks' lambda (Λ).

Primary Attitude Scale (PAS)

A two-way mixed factorial analysis of variance (ANOVA) revealed that the main effect for the younger students' Pre- versus post-test score was not significant, $\Lambda = .97, F(1, 20) = .68, p = .42$. Additionally, both interaction effects (pre- versus post-test score x Gender; Pre- versus post-test score x Treatment) were not significant, $\Lambda = .99, F(1, 20) = .01, p = .91$, $\Lambda = .96, F(1, 20) = .91, p = .35$ (See Table 5 for means and standard deviations). This finding may suggest that having a pet in the classroom may not be effective with the younger older students (See Table 5 for means and standard deviations).

Table 5

Means and Standard Deviations of Primary Attitude Scale (The younger students: Classroom as a unit of analysis)

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
E group	40.95 (.54) $n = 2$	41.98 (.41) $n = 2$	41.46 (.72) $n = 4$	41.32 (.34) $n = 2$	41.84 (.16) $n = 2$	41.58 (.37) $n = 4$
C group	39.33 (.34) $n = 10$	40.06 (.73) $n = 10$	39.70 (.72) $n = 20$	37.67 (3.32) $n = 10$	38.48 (3.49) $n = 10$	38.07 (3.34) $n = 20$

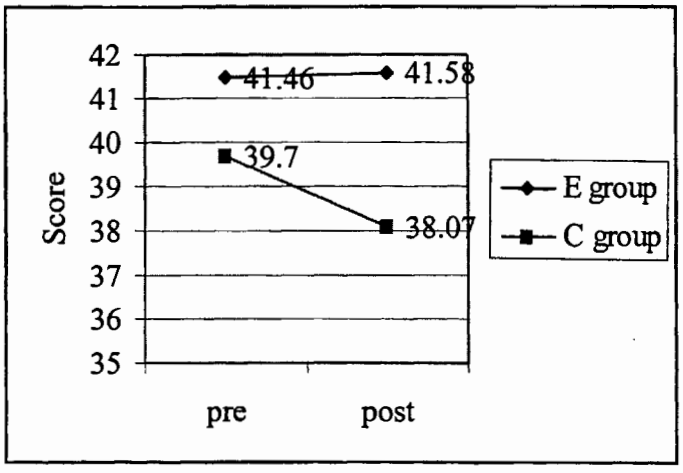

Figure 7 Mean Pre-test and Post-test Scores of Primary Attitude Scale (Classroom as a unit of analysis)

Intermediate Attitude Scale (IAS)

A two-way mixed factorial analysis of variance (ANOVA) revealed that the main effect for the older students' Pre- versus post-test score was not significant, $\Lambda =$

.97, $F(1, 22) = .59$, $p = .45$. However, while the interaction effect between Pre- versus post-test score and Gender was not significant, $\Lambda = .97$, $F(1, 22) = .74$, $p = .40$, the interaction effect between Pre- versus post-test score on IAS and Treatment (E group and C group) was significant, $\Lambda = .82$, $F(1, 22) = .48$, $p < .05$, partial $\eta^2 = .18$ (See Table 6 for means and standard deviations). This finding suggests that the E group students (classroom with pets) showed significantly greater gains in empathy measurement (IAS) from the pre-test to the post-test than C group students that did not have any pets in the classroom. This finding may also suggest that having a pet in the classroom may be more effective with the older students, because there were no significant interactions on treatment with the younger students using the PAS.

Table 6

Means and Standard Deviations of Intermediate Attitude Scale (The older students: Classroom as a unit of Analysis)

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
E group	98.58 (3.10) $n = 3$	101.95 (2.94) $n = 3$	100.27 (3.27) $n = 6$	99.04 (2.68) $n = 3$	104.60 (3.30) $n = 3$	101.82 (4.07) $n = 6$
C group	101.19 (5.02) $n = 10$	102.84 (3.41) $n = 10$	102.02 (4.26) $n = 20$	97.18 (5.85) $n = 10$	100.39 (3.15) $n = 10$	98.78 (4.86) $n = 20$

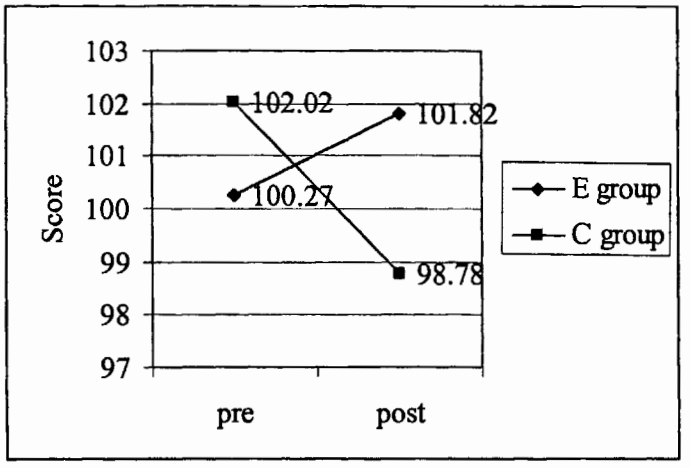

Figure 8 Mean Pre-test and Post-test Scores of Intermediate Attitude Scale (Classroom as a unit of analysis)

Billy and the Fireman Test

The Younger Students (Second and Third Graders)

A two-way mixed factorial analysis of variance (ANOVA) revealed that the main effect for the younger students' Pre- versus Post-test was not significant, $\Lambda = .93$, $F(1, 20) = 1.57$, $p = .23$. Additionally, both interaction (Pre- versus post-test score x Gender, Pre- versus post-test score x Treatment) were not significant, $\Lambda = .99$, $F(1, 20) = .01$, $p = .91$, $\Lambda = .92$, $F(1, 20) = 1.64$, $p = .21$. The Pre- versus post-test score of the E group (pre-test $M = 1.72$, $SD = .41$; post-test $M = 1.72$, $SD = .61$) was not significantly different from the Pre- versus post-test score of the C group, (pre-test $M = 1.30$, $SD = .36$; post-test $M = 1.72$, $SD = .35$). (See Table 7 for means and standard deviations).

Table 7

Means and Standard Deviations of Billy and the Fireman Test (The younger students: Classroom as a unit of analysis)

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
E group	1.52 (.57) $n = 2$	1.93 (.10) $n = 2$	1.72 (.41) $n = 4$	1.42 (.87) $n = 2$	2.02 (.08) $n = 2$	1.72 (.41) $n = 4$
C group	1.15 (.33) $n = 10$	1.45 (.33) $n = 10$	1.30 (.36) $n = 20$	1.62 (.33) $n = 10$	1.81 (.37) $n = 10$	1.72 (.35) $n = 20$

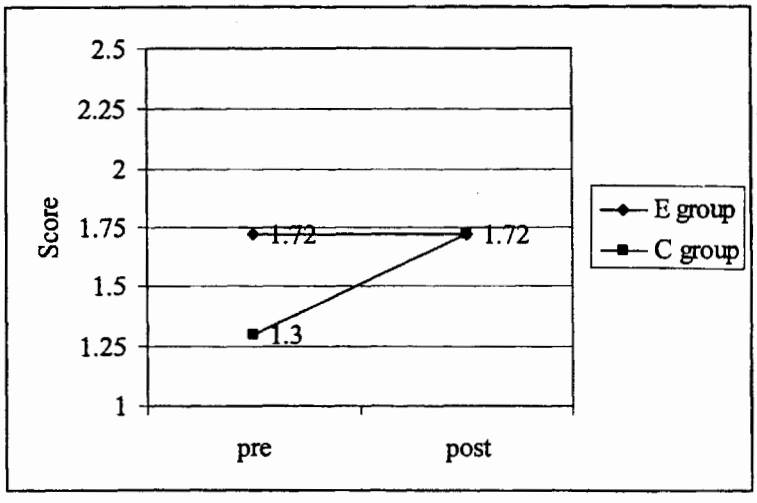

Figure 9 Mean Pre-test and Post-test Scores of Billy and the Fireman Test (Classroom as a unit of analysis: The younger students)

The Older Students (Fourth and Fifth Graders)

For the older students, the main effect for Pre- versus post-test score was not found, $\Lambda = .99$, $F(1, 22) = .01$, $p = .92$. While the interaction effect Pre- versus post-

test score and Treatment was not significant, $\Lambda = .99$, $F(1, 22) = .03$, $p = .86$, the interaction between Pre- versus post-test score and Gender was significant, $\Lambda = .78$, $F(1, 22) = 6.41$, $p < .05$. Female students significantly changed their score on the Fireman Test from the pre-test time to the post-test time (pre-test E group $M = 2.10$, $SD = .41$; C group $M = 2.05$, $SD = .49$; post-test E group $M = 2.57$, $SD = .20$; C group $M = 2.20$, $SD = .27$) than male students did (pre-test E group $M = 1.89$, $SD = .28$; C group $M = 2.05$, $SD = .36$; post-test E group $M = 1.44$, $SD = .31$; C group $M = 1.83$, $SD = .54$). (See Table 8 for means and standard deviations)

Table 8

Means and Standard Deviations of Billy and the Fireman Test (The older students: Classroom as a unit of analysis)

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
E group	1.89 (.28) $n = 3$	2.10 (.41) $n = 3$	2.00 (.33) $n = 6$	1.44 (.31) $n = 3$	2.57 (.20) $n = 3$	2.00 (.66) $n = 6$
C group	2.05 (.36) $n = 10$	2.05 (.49) $n = 10$	2.05 (.42) $n = 20$	1.83 (.54) $n = 10$	2.20 (.27) $n = 10$	2.01 (.45) $n = 20$

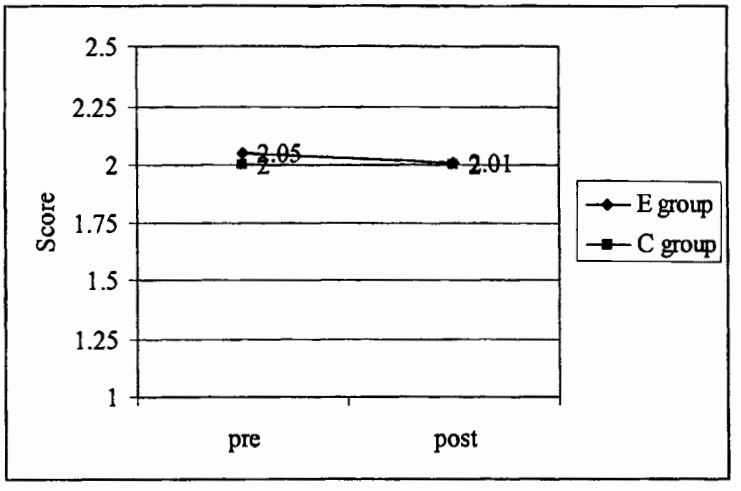

Figure 10 Mean Pre-test and Post-test Scores of Billy and the Fireman Test (Classroom as a unit of analysis: The older students)

The study hypothesized that the classroom mean scores of the older students (fourth and fifth graders) on empathy measurement would show significant improvement while the younger students (second and third graders) would show less change in scores across the program (hypothesis 3), and the classrooms mean scores in the post-test for the classrooms with pets (experimental group: E group) on the empathy measurement (PAS, IAS, and Fireman Test) would significantly increase from pre-test, while the control group (C group) would show little change in scores (hypothesis 4). Findings from analyses with classroom as a unit of analysis found that the interactions between the older students' score improvement (pre- vs. post-test score) and the treatment (with or without classroom pets) were significant while no significant interactions were found in the younger students' data. This may indicate

that the treatment may be more effective for the older students, and this finding is consistent with the findings from individual as a unit of analysis.

Generalization of Empathy from Animals to Humans

One of the main goals of the study was to determine whether children's empathy toward animals would be generalized to human directed empathy.

Hypothesis 5: The experimental group's post-test Primary Attitude Scale (PAS) and Intermediate Attitude Scale (IAS) scores will be significantly positively correlated to higher scores on the Bryant's Index of Empathy, while no significant correlations will be observed between the same measures for the control group. Specifically, correlations of the older students will be significantly higher than correlations of the younger students. This gives an idea of whether increases in empathy toward animals generalizes to or is associated with higher empathy toward people. A Pearson product-moment correlation coefficient analysis was performed to evaluate whether children's humane attitudes toward animals (PAS and IAS scores) were related with empathic skills toward humans (Index of Empathy score). Additionally, fisher's *z* transformation was conducted to investigate whether correlations between empathy toward animals (PAS or IAS) and empathy toward humans (Index of Empathy) were significantly different across the group (E group x C group; male x female). Because the sample of each group was different, I employed fisher's value *z* transformation technique in order to compare the correlations across the different groups.

For the younger students, there was a significant correlation between humane attitude toward animals (PAS) and empathy toward humans (Index of Empathy), $r = .19, p <. 001$. Although the fisher's z statistics were not significant (fisher's $z = 0.39$, $p = .70$), the correlations between PAS score and Index of Empathy score of the E group students were higher ($r = .21, p < .001$) than the C group students ($r = .15, p < .001$) descriptively. In addition, correlations of male students ($r = .21, p < .01$) were higher than that of the female students ($r = .12, p = .08$) (fisher's $z = .67, p = .50$) descriptively.

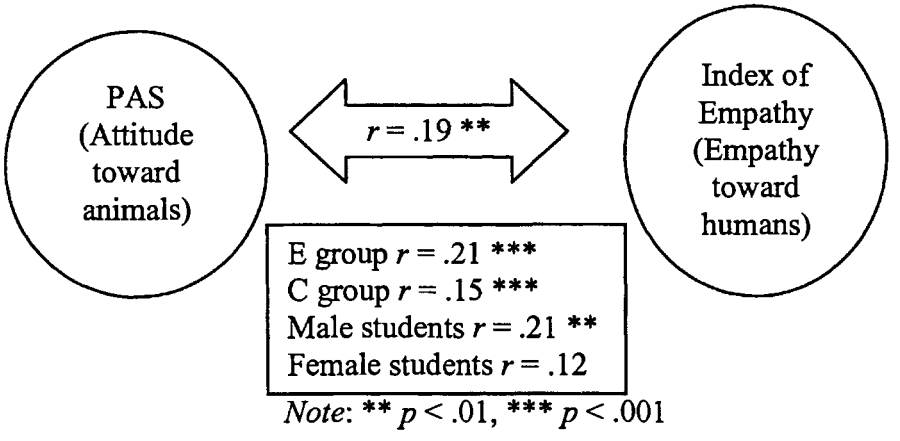

Figure 11 Correlations between Empathy toward Animals and toward Humans (The Younger Students)

For the older students, significant correlations between humane attitude toward animals (IAS) and toward humans (Index of Empathy) were found ($r = .50, p < .001$). Again, fisher's z statistics were not significant (fisher's $z = .57, p = .57$), yet the correlations between IAS score and Index of Empathy score of the C group students were higher ($r = .50, p < .001$) than the E group students ($r = .43, p < .001$)

descriptively. In addition, the correlations of male students ($r = .48, p < .001$) were higher than that of the female students ($r = .44, p < .001$) (fisher's $z = .37, p = .71$) descriptively. See Table 9 for means and standard deviations.

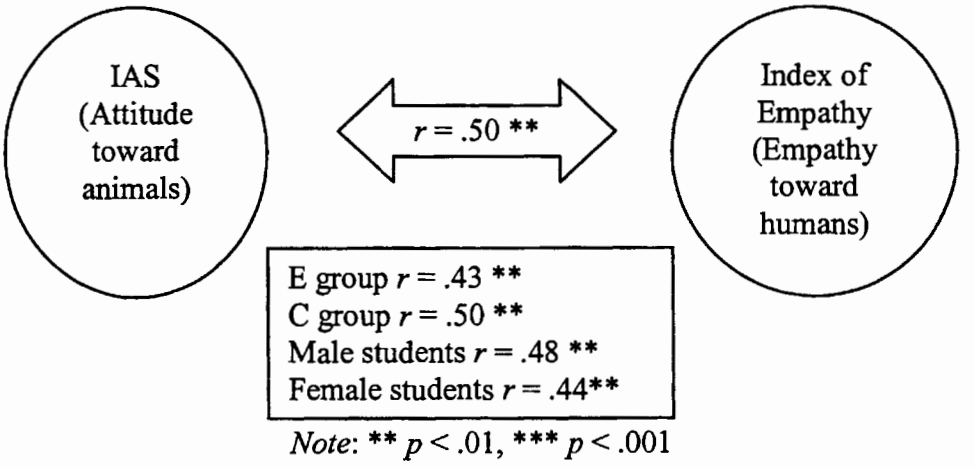

Figure 12 Correlations between Empathy toward Animals and toward Humans (The Older Students)

Overall findings are consistent with Ascione's study (1992), that found that both the younger (first and second graders) and the older (fourth and fifth graders) students' attitude scale scores were significantly correlated with Bryant's Empathic Index questionnaire ($r = .31, p < .001$ for the younger students; $r = .34, p < .001$) respectively. Additionally, I found that male students' correlation between empathy toward animals and humans was higher than those of female students descriptively. This finding may support the notion that animals may effectively promote children's empathy, especially among male children (c.f. Melson & Fogel, 1982).

Subsequently, the correlations between attitude toward animals and empathy toward humans across the students' age group (the younger students vs. the older

students) were compared with fisher's z value in order to investigate the students' development of perspective taking, as Piaget claimed.

I found a significant difference across the students' age group. The older students correlations between attitude toward animals and empathy toward humans ($r = .50, p < .001$) were significantly higher than the younger students'($r = .19, p < .001$), fisher's $z = 4.10, p < .001$. Additionally, when only male students' correlations between attitude toward animals and empathy toward humans across the age group (the younger male students vs. the older male students) were compared, again the older male students' correlations ($r = .43, p < .001$) were significantly higher than the younger male students' ($r = .21, p < .01$), fisher's $z = 2.31, p < .01$. This finding may support the idea that the older students who are anticipated in the concrete operational stage, are more capable of taking perspective of another than the younger students who are anticipated in the preoperational stage.

Table 9

Means and Standard Deviations of Index of Empathy (Post-test) (Individual as a unit of analysis)

	The Younger students			The Older students		
		Mean	SD		Mean	SD
E group	Male (n = 40)	35.48	3.35	Male (n = 51)	35.62	3.64
	Female (n = 51)	37.36	2.29	Female (n = 52)	37.78	2.51
	Total (n = 91)	36.52	2.94	Total (n = 92)	36.71	3.29
C group	Male (n = 165)	34.68	3.36	Male (n = 186)	34.09	4.36
	Female (n = 165)	36.51	2.72	Female (n = 159)	36.36	3.30
	Total (n = 330)	35.59	3.18	Total (n = 345)	35.13	4.06

Moral Reasoning Development

In order to assess whether students showed changes in their moral reasoning skill, they were asked to choose one option of how they would react if they saw either: 1) their friend; 2) a school pet; 3) a wandering animal on the street; or 4) their home pet; attacked by strangers. The younger students had four choices: 1) "*I would help him/her even if I were alone*"; 2) "*I would go to get a teacher or an adult*"; 3) "*Even though I feel sorry for him/her, I would pretend not to notice it because I don't want to fight with my friend*"; or 4) "*I would not help because it's none of my business.*" The

older students had an additional choice: "*I would help only if people who were attacking were small in number and looked weaker than me.*"

In both younger and older students' post-test, there were no significant differences in younger students' helping behavior decisions across the group. In the older students' post-test, there were no significant differences were found across the group.

Children's Animal Maltreatment Experiences

The study examined students' animal abuse experiences, both as a perpetrator and a witness, to investigate whether the treatment of having classroom pets could serve as an intervention for students' abuse of animal experiences. Because of the sensitivity of the question, only the older students were asked about their experiences of animal abuse for the past six months. Students were asked: 1) self as an abuser of socially valued animals (e.g., dog, cat); 2) self as an abuser of less socially valued animals (e.g., fish, insect); 3) self as a witness of a friend/a family member's abusive behaviors of socially valued animals (e.g., dog, cat); 4) self as a witness of a friend/a family member's abusive behaviors of less socially valued animals (e.g., fish, insect). However, only own abuse experiences of students will be discussed here.

Among the older students, 19.7 % of students reported their own abusive experiences toward socially valued animals (e.g., dog, cat) in the pre-test (vs. 23.1% in the post-test). The pre-test mean of IAS of students who reported abusive experiences toward socially valued animals ($M = 95.55$, $SD = 8.96$) was significantly lower than IAS mean of students who reported no abusive experiences toward socially valued

animals ($M = 102.02$, $SD = 8.29$), $t\ (430) = 2.42$, $p < .05$. However, the post-test mean of IAS of students who reported their abuse experiences of socially valued animals was not significantly lower than IAS mean of students who reported no abuse experience of socially valued animals, $t\ (431) = 1.77$, $p = .08$. Male students reported significantly more animal abuse episodes than female students in both the pre-test, $\chi^2(1, n = 85) = 17.81$, $p < .01$ and the post-test, $\chi^2(1, n = 100) = 18.72$, $p < .01$ (See Table 10 for descriptive statistics).

Additionally, 41.1 % of students (vs. 38.5 % in the post-test) reported their own abusive experiences toward less social valued animals (e.g., fish, insect) in the pre-test. The pre-test mean of IAS of students who reported abuse experiences toward less socially valued animals ($M = 100.48$, $SD = 8.34$) was significantly lower than IAS mean of students who reported no episode of abuse experience toward socially valued animals ($M = 102.32$, $SD = 8.58$), $t\ (434) = 2.23$, $p < .05$ (See Table 11 for the descriptive statistics). However, the post-test mean of IAS of students who reported their abuse experiences of less socially valued animals was not significantly lower than IAS mean of students who reported no episodes of abuse experiences of socially valued animals, $t\ (421) = 1.19$, $p = .24$. Male students reported significantly more animal abuse experience episodes than female students in both the pre-test, $\chi^2(1, n = 179) = 10.14$, $p < .01$, and the post-test, $\chi^2(1, n = 163) = 9.96$, $p < .01$ (See Table 11 for descriptive statistics).

Although the number of E group students who treated socially less valued animals cruelly decreased from the pre-test time to the post-test time (E group pre-test

= 48.1 %, E group post-test = 39.2 %, C group pre-test = 39.0 %, C group post-test = 38.8 %), the number of students who treated socially valued animals cruelly increased (E group pre-test = 15.5 %, E group post-test = 27.0 %, C group pre-test = 20.9 %, C group post-test = 21.5%). This may be an indication that treatment might not be effective to all students, and increase of students' stress as they reach the higher grades might cause increase number of animal abuse experiences at the post-test time.

Table 10

Means and Standard Deviations of the Older Students who abused Socially Valued Animals Maltreatment on Intermediate Attitude Scale

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
Had Experience of Abuse	99.65 (8.64) $n = 64$	99.24 (10.09) $n = 21$	95.55 (8.96) $n = 85$	95.82 (10.45) $n = 72$	102.94 (7.30) $n = 28$	97.81 (10.15) $n = 100$
No Experience of Abuse	102.39 (8.38) $n = 173$	101.66 (8.21) $n = 174$	102.02 (8.29) $n = 347$	98.31 (9.37) $n = 158$	100.79 (7.32) $n = 174$	99.59 (8.43) $n = 332$

Table 11

Means and Standard Deviations of the Older Students who abused Less Socially Valued Animals Maltreatment on Intermediate Attitude Scale

	Pre-test			Post-test		
	Male	Female	Total	Male	Female	Total
Had Experience of Abuse	100.30 (8.50) $n = 114$	100.80 (8.10) $n = 65$	100.48 (8.34) $n = 179$	96.48 (8.62) $n = 101$	102.05 (7.30) $n = 62$	98.60 (8.56) $n = 163$
No Experience of Abuse	103.23 (8.44) $n = 124$	101.47 (8.66) $n = 133$	102.32 (8.58) $n = 257$	98.32 (10.48) $n = 121$	100.88 (7.40) $n = 138$	99.66 (9.17) $n = 259$

Teachers' Feedback/Student Rating Survey

Teachers in the experimental classrooms were asked to fill out the feedback survey at the end of the program. Teachers were asked to rate (5-point Likert-type scale) each student's observable changes throughout the program and their own attitude toward the program (open-ended questionnaire). Six teachers returned the feedback survey and each student's rating scale survey.

Although this was a small sample size, all teachers agreed that having a classroom pet was beneficial for their students (*Strongly Agree* = 66.7 %, *Agree* = 33.3 %), and 50 % of teachers answered that they would like to have a classroom pet next year, too. Teachers did not support the idea that having a classroom pet was only beneficial to a small number of students (*Strongly Disagree* = 16.7 %, *Disagree* = 33.3 %, *Not Sure* = 50 %). It is important to note that half of the teachers felt that having a

classroom pet was a lot of extra work and did not feel hassle was worthwhile (*Strongly Disagree* = 33.3 %, *Disagree* = 16.7 %, and *Not Sure* = 50 %).

A two-way within-subjects analysis of variance was conducted to evaluate the teachers' rating survey of each student's observable behavioral changes from the beginning of the program to the end of the program. Behavioral change (main effect) and gender x main effect interaction effect were tested using the multivariate criterion of Wilks' lambda (Λ).

Students' Engagement Level

Teachers in the E group rated each student's engagement level (e.g., playing with the classroom pets, taking care of the classroom pets) on a 5-point Likert-type Scale (1 = *Very Weak*, 2 = *Weak*, 3 = *Average*, 4 = *Strong*, and 5 = *Very Strong*). The main effect for engagement level improvement was significant, $\Lambda = .90$, $F(1, 205) = 22.55$, $p < .001$. Engagement levels for both male students (M at the beginning = 2.46, $SD = .77$, M at the end = 2.67, $SD = .74$) and female students (M at the beginning = 3.19, $SD = .91$, M at the end = 3.39, $SD = .89$) significantly increased throughout the program. The interaction effect (engagement level improvement x gender) was not significant, $\Lambda = 1.00$, $F(1, 205) = .04$, $p = .83$. This finding suggests that both males and females showed improved engagement with their classroom pets. See Table 12, 13, and 14 for detailed descriptive statistics.

Table 12

Teacher's Questionnaire: Student Rating
(Q1,2: What were the engagement levels (e.g., playing with, talking to) when students have a classroom pet?)

	At the Beginning	At the End
Very Weak	6.20 %	1.90 %
Weak	25.40 %	23.90 %
Average	50.70 %	47.40 %
Strong	11.50 %	19.60 %
Very Strong	6.20 %	7.20%

Table 13

Teacher's Questionnaire: Student Rating
(Q3. How often do they take care of a pet when they have a responsibility?)

None	1 %
Rarely	22 %
Sometimes	30.10 %
Often	27.80 %
Every time	19.10 %

Table 14

Teacher's Questionnaire: Student Rating
(Q4. How often do they take care of a pet voluntarily?)

None	6.20 %
Rarely	42.10 %
Sometimes	32.50 %
Often	15.30 %
Every time	3.80 %

Empathy toward the Classroom Pet

Teachers rated each student's empathic behavior toward their classroom pets on a 5-point Likert-type scale (1 = *Very Weak*, 2 = *Weak*, 3 = *Average*, 4 = *Strong*, and 5 = *Very Strong*). I defined "empathy" here as "behaviors that include cleaning cage without being asked, expressing concern for food or health of pets, and other behaviors that are beneficial to animals."

A two-way mixed factorial analysis of variance was conducted to evaluate the empathy score improvement of all E group students from the beginning of the program to the end of the program. The main effect for improvement of empathic behaviors toward classroom pets was significant, $\Lambda = .86$, $F(1, 205) = 32.75$, $p < .001$. Empathic behaviors for both male students (M at the beginning = 2.50, $SD = .70$, M at the end = 2.67, $SD = .74$) and female students (M at the beginning = 2.99, $SD = .66$, M at the end

= 3.28, *SD* = .78) significantly improved throughout the program. This finding suggests that both males and females showed increased empathic behaviors toward their classroom pets. See Table 15 for detailed descriptive statistics.

Table 15

Teacher's Questionnaire: Student Rating
(Q5.6. How often do they show empathic behaviors toward the classroom pet?)

	At the Beginning	At the End
None	3.30 %	1.90 %
Rarely	27.80 %	24.90 %
Sometimes	59.30 %	46.40 %
Often	7.70 %	24.40 %
Every time	1.90 %	2.40%

Empathy toward Peers

Teachers rated each student's empathic behaviors toward their peers on a 5-point Likert-type scale (1 = Very Weak, 2 = *Weak*, 3 = *Average*, 4 = *Strong*, and 5 = *Very Strong*). A two-way mixed factorial analysis of variance found that the main effect for improvement of empathic behaviors toward peers was significant, $\Lambda = .92$, $F(1, 205) = 15.81$, $p < .001$. Empathic behaviors toward peers for both male students (*M* beginning = 2.78, *SD* = .70, *M* at the end = 2.88, *SD* = .70) and female students (*M* beginning = 3.15, *SD* = .80, *M* at the end = 3.31, *SD* = .84) significantly improved throughout the program. No significant interaction was found. This finding suggests

that both male and female students showed improved empathic behaviors toward their peers. See Table 16 for detailed descriptive statistics.

Table 16

Teacher's Questionnaire: Student Rating
(Q7.8. How often did they show empathic behaviors toward peers?)

	At the Beginning	At the End
None	1.90 %	1.00 %
Rarely	22.50 %	19.60 %
Sometimes	53.10 %	50.70 %
Often	20.10 %	24.40 %
Every time	2.40 %	4.30 %

Teachers' Open-Ended Feedback Survey

In the open-ended survey, most E group teachers addressed that taking care of classroom pets on weekends and holidays was one of the difficulties they faced. Some students were able to take the classroom pet home with the permission of their parents on weekends and holidays. However, many students lived in apartments that did not allow pets, and therefore not all students could take a turn bringing the classroom pet home. Additionally, teachers were concerned for students who had asthma or allergies to animals, and had difficulties gaining parental understanding and support.

On the other hand, most teachers pointed out that students showed more empathic behaviors toward classroom pets and their classmates. Some students started to come to school earlier so that they could take care of classroom pets (e.g., cleaning the cage, feeding or petting them). Many students and their parents voluntarily brought food for their classroom pets. Some students told their teachers that school became a more fun place because of the classroom pet. Teachers reported that many students started to interpret out loud their classroom pets' feelings while observing animals' behaviors, and students reported to teachers any small change they found because students worried about their classroom pets' health. In addition, teachers noted that students developed friendships with other classmates and responsibility through taking care of classroom pets together. In sum, all teachers reported that having classroom pets influenced their students positively, and students started to treat classroom pets and other students more humanely toward the end of the program. Any teachers suggested that having a classroom pet was the most effective tool to promote students' development of empathy in their busy daily life, and this development of empathy toward classroom pets was reportedly believed to be connected to empathy toward peers.

Treatment Intensity Comparison

Because a more intensified program "with pets" was experienced in the experimental classrooms in Japan, the empathy scores of Japanese students in the current study were expected to be higher than the US students' scores in the previous study (Ascione, 1992), which used a more traditional approach to humane education

on all measures of humane attitudes toward animals (i.e., Primary Attitude Scale, Intermediate Attitude Scale). In order to compare the treatment effect (intensive interaction with animals) with prior studies on traditional humane education programs (e.g., Ascione, 1992), the effect sizes were compared. The effect sizes for Ascione's (1992) study were computed using the reported standard deviation and score means. The effect size of the younger students' scores in Ascione's study ($d = .83$) was stronger than the current study's effect size (E group: $d = .20$). The effect size of the older students' scores in Ascione's study ($d = 1.57$) was also stronger than the current study's effect size ($d = .37$).

This finding was against the prediction of the study. However, I could not detect whether this difference was due to difference of the treatment, culture value, or some other extraneous factors. Additionally, I found that different trend on students' score changed across the study. While the US experimental group students improved and the US control group students' scores remained the same, I found that Japanese experimental group students' score remained the same while Japanese control group students' scores significantly dropped across the year. This trend, dropping scores across the year of Japanese control group students, might be an indication of their increasing stress, yet further investigation will be needed. Replicating the current study across the nations will be helpful to further investigate the treatment effects across cultures.

CHAPTER VI: DISCUSSION

Summary of Results

The current study had to treat individual data within each test (the pre-test or the post-test) as a unit of analysis or treat each classroom as a unit of analysis in order to compare the pre-post changes, because it was not possible to match the individual changes across the year given the nature of anonymity in the survey. While this analysis approach made it more difficult, the study found relatively consistent results from each analysis and some meaningful findings.

For the younger students, the study did not find significant score changes throughout the program and across the experimental and control groups. Although the E group students' scores on the Primary Attitude Scale (PAS) and the Billy and the Fireman Test (Fireman Test) were significantly higher than those of the C groups at the pre-test time, students' scores were not significantly different than one another at the post-test time. This may indicate that the treatment (having classroom pets) did not affect the E group children. This finding may support the research hypothesis that the preoperational children (the younger students) would not change because of their inability to take other's perspectives.

From the Background Information Survey, however, it was found that the younger students in the E group developed more friendships, were less likely to be shy, and were more likely to help elderly people, and these findings were consistent with the teachers' feedback survey report. Although the younger students have not acquired the ability to take another's perspective, nor generalize empathy toward

animals to humans, treatment might promote faster cognitive development for the younger students.

On the other hand, the older students in the E group's scores on Intermediate Attitude Scale (IAS) and the Billy and the Fireman Test (Fireman Test) were significantly higher than those of the C group older students at the post-test time. Additionally, the study found significant gender differences on students' scores. Female students were more likely to score higher than the male students both in the pre-test and post-test. This indicates that the treatment was effective for all the older students, however female students are more empathic than male students regardless of the treatment group.

Furthermore, a student's empathy was significantly related to the student's attitude toward animals regardless of the student's ages. Additionally, the older students' correlation between empathy and attitude toward animals was significantly higher than the younger students' correlation descriptively. In addition, male students' correlation was higher than female students descriptively. This finding supports the idea that the older students' empathy toward animals might transfer to humans. Finally, it is important to note that not only was treatment effective for the older students, but it was especially effective for the male students to promote their empathy toward animals and humans.

Limitations and Future Research

Future research is suggested to approach a remedy for the following limitations.

One limitation in the current study was the lower levels of accuracy in measuring children's empathy using a survey method as compared to observational study methods. Collecting a survey questionnaire from young children is not the best way to obtain information about their attitudes (Henerson, Morris, & Fitz-Gibbon, 1987). The major issues underlying survey methods in children are their short attention spans, and their lower ability to understand question items. To help children understand each question, the researcher needs to explain each item very carefully, and read instructions repeatedly (Henerson, Morris, & Fitz-Gibbon, 1987). Providing practice items at the beginning of the questionnaire may be appropriate for younger children. In addition, a number of issues should be kept in mind when the study employed paper-pencil survey methods. First, children's answers might depend on the wording and ordering of questions. Secondly, students' social desirability might have influenced answers to survey questions even though surveys were anonymous and confidential. Although all questionnaires showed sufficient alpha levels, mixed method study (survey and observational method) is recommended for future research in order to obtain more accurate data.

In addition, I could not specifically investigate whether or not children are likely to imitate the empathic behaviors of peer models due to the survey method research. According to social learning theory, children are more likely to imitate a similar age group than adults and are often more motivated when they are working a problem with others. Subsequently, through cooperative learning, children have to explain their own ideas to others in order to resolve conflict, and they are more likely

to use high-quality cognitive strategies while working with others. Because I found that pet ownership at home was not a significant factor in the students' score on empathy measurement, investigating students' development of cognitive skills through cooperative learning during treatment curriculum via observational study would be appropriate.

Subsequently, though I hypothesized that the guided participation is more effective on the Japanese children who have been taught to value social ties and dependency more than children in the US, I could not detect the effectiveness of the guiding participants (e.g., classroom teachers' instruction) as Vygotsky claimed. There is a need for research that separates the effect of the pet from the effect that the pet has on the teacher's curriculum and instruction (regarding animal care) when compared to the curriculum and instruction the teacher would devise (regarding animal care) if the pet were not part of the classroom.

Due to the anonymity of the survey study, the pre-test and the post-test scores could not be matched to assess individual student's changes in scores across the year. It is recommended that each student be provided an identification number in the future to assess individual development. The major issue with treating the classroom as a unit of analysis instead of an individual as a unit of analysis was the reduction of statistical power due to the small number of classrooms (i.e., 22 classrooms instead of 420 individuals), which increases Type II error (An error which occurs when the null hypothesis is accepted; e.g., I assumed that there were no pre-existing differences across the group prior to the treatment, but in fact there were). However, the data was

derived from individual differences within each test as a unit of analysis and the data classroom differences as a unit of analysis produced relatively consistent results in the current study. Thus, it seems likely that the results are accurate. And significant correlations between empathy scores toward animals and empathy scores toward humans indicated that students' empathy toward classroom pets might be generalizable to humans. Yet, I also found that the number of older students in the E group who engaged in animal abuse had increased across the program. This may suggest that treatment may not be effective for all students who participated in the experimental group.

I divided all participants into either "the younger students" (pre-operational children: second and third graders) or "the older students" (concrete operational children: fourth and fifth graders) according to Piaget's cognitive developmental theory. However, I did not examine whether each student was in the expected stage as the study anticipated from students' age. Examining students' cognitive stage from the additional materials (e.g., implementing measures to assess students' cognitive skills) will be helpful for future study. Additionally, I did not specifically examine whether or not participants improved their skills of taking another's perspective. Investigating students' cognitive development with direct measure will be needed.

Though I employed the different version of the questionnaire considering participants' age (the younger students were provided *Primary Attitude Scale* while the older students were provided *Intermediate Attitude Scale*), it is recommended that the future study not use the different survey questionnaires, but only use one

questionnaire in order to investigate the level of impact on children's empathy through the treatment.

Another limitation to the present study was that teachers might have influenced children's empathy development. Given the voluntary nature of the experimental classrooms, teachers of those classrooms might have been high in empathy. I could not control for the pre-existing teachers' attitudes toward humane education programs, and this lack of random assignment of participants might impact the study's findings. Examining teachers' empathic attitudes toward animals and students may be useful in order to investigate the treatment effects on children's empathy development through the program. Additionally, random assignment of participants will be desirable to remedy possible pre-existing empathic attitudes within student and teacher population.

Although the current study was based on the study conducted by Ascione in the US in 1992 and was relatively consistent with findings with Ascione's study, I could not specifically detect whether the different findings were due to the intensified program (with employing living animals in the classroom), cultural differences, or some extraneous factors. Due to different cultural values and social norms, it is clear that there is a need for adjustment within the assessment of the current study on the effect of humane education for Japanese students. It is suggested that further investigations compare the same program across cultures and different programs within the same culture.

I did not investigate whether a "soft" pet was much more effective to promote students' empathy compared with the other animals, such as fish or snakes. Future

research is recommended to investigate whether various types of animals would influence children's empathy development through humane education.

Finally, the effectiveness length of the humane education program was uncertain. Longitudinal studies that follow children exposed to multiple years of the program would be needed. Future studies would allow for a more realistic program assessment for Japanese children.

Implications

The findings of the study supported the research hypotheses and indicated that having animals in the classroom may promote older children's empathy toward animals. Qualitative teachers' report suggests that these results may generalize to empathy toward peers. Specifically, I found the program was more effective for children who are in the concrete operational stage (aged 7 to 11) than children who are in the preoperational stage (aged 2 to 7). This finding may suggest that introducing animals to older children (concrete operational children) may be much more effective than introducing animals to younger children. This finding is supported by Piaget who claimed that concrete operational children have already acquired the ability to take the perspective of others. I found that older male children are more likely to engage in animal abuse than female children. This supports the need for humane education programs, which may serve as an early intervention program for future aggressive behaviors.

Since the Japanese Ministry of Education changed the school system from six days a week to five days a week in order to reduce intensity of academic pressure on

children and to give students more free time, issues of Japanese students' declining academic intelligence have been raised. Regardless of school system changes, the rate of serious crimes committed by young children has remained the same. If children are not taught to be mindful to others at home, we, the people in a society, have to take responsibility to raise our children to become successful members of our society. Having animals at school, even in the school yard can be very effective in teaching children to be kind to other creatures and can provide children opportunities to take other's perspectives. Although the current study placed pets inside of classrooms to intensify students' engagement levels, it is still possible that students can gain similar positive effects from pets outside of classrooms if teachers provide considerable encouragement and guidance. School should be a place to teach children not only formal study but also how to be a better human who can fit in a society. Humane education is one way to achieve that goal.

While schools consider taking care of school pets a huge time requirement and may debate the use of classroom time for such activities, taking care of pets may be effective to promote children's cognitive development, such as problem solving skills rather than memorizing textbooks as is typical today in the Japanese educational system. The investigation of students' academic achievement or cognitive development throughout the program was beyond the scope of this study and future research should look into children's cognitive development through humane education programs and the promotion of their academic intelligence through enhanced problem solving skills. All participating schools reported that they did not have a budget

problem in order to take care of classroom pets because most students and their parents voluntarily brought food and other necessary equipment for pets. Classroom pets seem to be a cost effective way to teach students valuable lessons in empathy for animals and humans. What the Japanese children need most is daily learning experiences regarding the value of life, not cramming for examinations.

Teachers do not have to take formal time to make their students interact with school pets. Children are active learners in nature and providing children opportunities and minimum guidance in an effective way are our duties. If children have more opportunities to interact with animals in their daily life, naturally they have more occasions to take the perspective of animals. This experience may help their ability of perspective taking and this ability is expected to apply when they interact with humans. Teaching children to be kind to animals may be the most effective way to raise our children to be healthy adults. This will, in turn, make our society a better place, because children are our future.

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Appendix: A

Informed Consent
(Directly translated into English from Japanese)

_____elementary school

Human Education Research: Effects on Children's Empathic Behaviors

First of all, we deeply appreciate your generous consideration to volunteer in our research project on humane education research. In our research, we are interested in children's moral development in humane education. Much empirical research has proven that teaching children to be caring animals will help children to develop empathic behaviors in later life. However, there is much focus and study on this topic and humane education is not part of school curriculum in Japanese educational systems. Therefore, I would like to conduct survey research to assess how Japanese children develop their empathic behaviors after students have a rabbit inside of the classroom for a year.

Minimal risk is anticipated for student participants in the study. The program for introducing pets into classrooms is going to be place whether I do this research or not. For classrooms that have classroom pets, there may be a small risk an animal will bite but since rabbits are not prone to biting, this risk is very small. The animals to be used in this study will be brought from the school-pet organization and are fully vaccinated. Students who have allergies to animals will be advised to use gloves and masks when they have contact with the animals. Further advice will be given by each prefecture's veterinarian who will be assisting with this project.

Survey will be administrated at the beginning of June and at the end of the school year. The only people who will have access to your students' questionnaires are Mika Maruyama and Dr. Nakagawa. Students can withdraw their participant in this study at any time. All information obtained in this study will be kept completely confidential. All research reports using this data will present information about the entire group of participants but will not present any single individuals' responses. Even if school principal and classroom teacher allow us to conduct survey research, students can choose whether they will fill out questionnaire or not. If you have concerns or problems about your students' participation in this study, please contact with me. Your signature indicates that you have read and understand the above information and you agree to allow your students to take part of this study. Please keep one copy for your records.

Thank you very much.

Mika Maruyama
Portland State University

Advisor/co-investigator
Dr. Mihoko Nakagawa
Principal of Japanese school pet veterinarian association

If you have any questions about this part of the study (or any other part), this form, or the questionnaires, you can contact Mika Maruyama at 1-971-544-1240 or mikam@pdx.edu. You can also contact the chair of the Human Subjects Research Review Committee (HSRRC) at Portland State University about your rights as a research participant (503-725-8182). The HSRRC hours are from 9:00am to 5:00pm.

Office of Research and Sponsored Projects
111 Cramer Hall
1721 SW Broadway
PO Box 751
Portland OR 97207-0751
(503) 725-3423
(503) 725-3416 (Fax)

Informed Consent

I _____ (your name) hereby permit that my students will participate in humane education research. I read all information, questionnaires, and outline of study. Although students can decide whether they will participate in this study or not, I will allow their participation in this study as a principal of school.

Name_____ Day_____

Appendix B

Primary Attitude Scale (For the younger students: second-third graders)

Primary Attitude Scale Instructions
(Introduce yourself) Hand out place markers and pencils.

I'M HERE TODAY TO FIND OUT HOW CHILDREN THINK AND FEEL ABOUT ANIMALS. I AM GOIND TO HADN OUT SOME PAPERS NOW BUT DO NOT WRITE ON THEM UNTIL I ASK YOU TO BEGIN. (Hand out tests)

THERE ARE QUESTIONS ON THE PAPERS AND I WILL READ EACH ONE ALOUD. AFTER I READ A QUESTOIN, I WOULD LIKE YOU TO DECIDE WHETHER YOUR ANSWER TO THE QUESTION IS "YES" OR "NO". THE "YES'S" HAVE A CIRCLE AROUND THEM AND THE "NO'S" HAVE A SQUARE AROUND THEM.

YOU SHOULD MARK YOUR ANSWER BY PUTING AND X OVER THE "YES" OR AN X OVER THE "NO" LIKE THIS (hold up posters with sample answers). WHEN YOU ARE DECIDING ON YOUR ANSWER, REMEMBER THAT I WANT TO FIND OUT WHAT YOU THIKNK OR FEEL. SO, YOU DECDIE WHAT YOU THINK IS THE BETTER ANWER; NOT WHAT YOUR PARENTS OR FRIENDS OR TEACHER MIGHT THINK.

I WANT YOU TO BE HONEST AND PUT DOWN THE ANSWER YOU THIKNK IS BETTER. YOUR PARENTS AND YOUR TEACHER WILL NOT SEE THE ANSWER YOU PUT DOWN, SO ANSWER THE WAY YOU REALLY FEEL.

IF YOU THINK IT'S HARD TO DECIDE BETWEEN "YES" OR "NO" ON SOME QUESTION, JUST MARK THE ONE YOU HTINK IS A BETTER ANSWER.

BE SURE TO ANSER ALL THE QUESTIONS: DON'T SKIP ANY. AND, REMEMBER TO MARK ONLY ONE ANSER; MARK "YES" OR "NO" BUT DO NOT MARK BOTH OF THEM.

BEFORE WE BEGINE, LET'S PRACTICE. PUT YOUR PLACE MARKER UNDER THE LINE WITH THE CAR. LOOK DOWN THE QUESTOIN THAT HAS A CAR NEXT TO IT. THE QUESTION SAYS; "IS IT FUN TO GO SWIMMING IN THE SUMMER?" IF YOU THINK IT IS FUN TO GO SWIMMING IN THE SUMMER, PUT YOUR X ON "YES." IF YOU DO NOT HTINK IT IS FUN TO GO SWIMMING IN THE SUMMER, PUT YOUR X ON "NO."

NOW, MOVE YOUR PLACE MARKER DOWN SO THE NEXT QUESTION AND ITS ANSWERS ARE SHOWING.

LET'S TRY ANOTHER. LOOK AT THE NEXT QUESTION WITH THE APPLE NEXT TO IT. IT SAYS "IS IT BAD TO SMILE AT YOUR FRIENDS?" IF YOU THINK IT IS BAD TO SMILE AT YOUR FRIENDS PUT YOUR X ON

"YES." IF YOU DO NOT THINK IT IS BAD TO SMILE AT YOUR FRIENDS PUT YOUR X ON "NO."

LET'S TRY ONE MORE. SEE THE QUESTION WITH THE ARROW NEXT TO IT? IT SAYS: "DO YOU HATE VANILLA ICE CREAM?" IF YOU DO HATE VANILLA ICE CREAM, PUT YOUR X ON "YES." IF YOU DO NOT HATE VANILLA ICE CREAM, PUT YOUR X ON "NO."

ARE THERE ANY QUESTIONS?

IF, WHEN I READ A QUESTION, YOU HEAR A WORD YOU DON'T UNDERSTAND, RAISE YOUR HAND AND WE'LL HELP.

TURN THE PAGE NOW AND WE'RE READY TO BEGIN.

PRIMARY ATTITUDE SCALE
TEACHER_____
GRADE_____

Is it fun to go swimming in the summer? Yes No

Is it bad to smile at your friends?
Yes No

Do you hate vanilla ice cream? Yes No

1. Do dogs hate to sit in a car with the windows closed when it's really hot outside?
Yes No

2. Do you think it's fun to break up a spider's web? Yes No

3. Would you be sad if you saw a horse fall down? Yes No

4. Is it good to have rules, like do's and don'ts, for taking care of a classroom pet?
Yes No

5. Are wolves always mean like the one in the story of little read riding hood?
Yes No

6. Should you spank a cat to teach it to mind you? Yes No

7. Do you think that having a classroom pet can help you learn things?
Yes No

8. Is it okay to leave a dog by itself for a few days as long as it's inside?
Yes No

9. Do you think it's silly to give chickens plenty of space to move around in?
Yes No

10. Do you think that people who won't eat meat are stupid?
Yes No

11. Is it bad to have more pet animals around even if there are no homes for them?
Yes No

12. Do you think that you would like to be a person who takes care of animals when you grow up? Yes No

13. Is it good to ask everyone in your family to help pick the kind of pet you keep?
Yes No

14. Do you think our world would still be a fun place if all the birds in the world were dead? Yes No

15. Do you think that everybody loves to hunt animals? Yes No

16. Do you think animals need laws to protect them? Yes No

17. Would a lion make a good pet? Yes No

18. Is it okay to step on an ant hill to watch the ants run around?
Yes No

19. Do you think a pet cat should have to find its own food to eat?
Yes No

20. Do you think all pet dogs like to go on car trip? Yes No

21. Are you glad there is an animal control person to catch stray dos in your neighborhood? Yes No

22. Would it be a bad idea to let your pet follow you to school?
Yes No

23. Do you think it's good for someone to take care of a classroom pet hamster during Christmas vacation? Yes No

Appendix C

Intermediate Attitude Scale (For the older students:fourth-fifth graders)

Intermediate level Instructions

(Introduce self) Hand out tests and pencils and place markers.

I am working with some people who are trying to find out how children your age think and feel about animals. But, before I tell you more, I would like you to put some information on the first page of the sheets we've handed out to you.

On the top sheet, there are spaces for you to write in your name, your teacher's name, your grade, and your answers to some other questions. I'll give you a few minutes now to fill in that information. Stop writing before you get to the practice sentence.

(Time to complete)

On the sheets that you have, there are a number of sentences. There is a practice sentence at the bottom of the first sheet that says: "I think that summer vacation is too long." for this sentence and all the other sentences, I would like you to decide if you strongly agree, agree, disagree, or strongly disagree with what the sentence says and then circle your answer.

Are there any questions so far?

Remember to circle only one answer for each question and be certain to put an answer for every item even if you're not sure exactly how you think or feel about the sentence.

As you decide on your answer, remember that I want you to answer the way you really think. Be honest and answer the way you feel. Your teacher and your parents will not see the answers you put down. Do not say anything or make comments when you hear a sentence since that might affect your classmates' answers. I will read each number and the sentence we're on out loud and then give you time to put down your answer. You should use the cover sheet we've give you to help you keep your place.

Okay, let's begin. Turn to the next page.

(Read each sentence and allow 15 seconds for answer)

1. Is it better to abandon a pet than to bring it to an animal shelter to be killed?
   Strongly Agree Agree Disagree Strongly Disagree

2. All cats like to be taken on trips.
   Strongly Agree Agree Disagree Strongly Disagree

3. Pet animals should not be allowed to roam around free in their neighborhood.
   Strongly Agree Agree Disagree Strongly Disagree

4. It's wrong for other people to tell you what kinds of animals you can and cannot hunt.
   Strongly Agree Agree Disagree Strongly Disagree

5. A cat might feel lonely if it had no one to care for it over a weekend.
   Strongly Agree Agree Disagree Strongly Disagree

6. Wild animals are not able to perspective their own habitats and need help from people.
   Strongly Agree Agree Disagree Strongly Disagree

7. You can never know how an animal feels because animals can't talk.
   Strongly Agree Agree Disagree Strongly Disagree

8. People who abandon pets do not really care about pets.
   Strongly Agree Agree Disagree Strongly Disagree

9. It's exciting when you see a galloping horse fall down on a TV show.
   Strongly Agree Agree Disagree Strongly Disagree

10. There are good things about all animals even those I don't like.
    Strongly Agree Agree Disagree Strongly Disagree

11. We will always have room in our world for all the pet animals that are born.
    Strongly Agree Agree Disagree Strongly Disagree

12. People should not try to make wild animals become pets.
    Strongly Agree Agree Disagree Strongly Disagree

13. If I owned a place that keeps animals, I would try to keep as many animals in a pen as I could fit in.
    Strongly Agree Agree Disagree Strongly Disagree

14. Watching birds with binoculars is more fun than shooting pheasants.
    Strongly Agree Agree Disagree Strongly Disagree

15. A dog that strays away from home can make its owner sad but it won't affect other people in the neighborhood.
    Strongly Agree Agree Disagree Strongly Disagree

16. Pet cats can usually take care of themselves when a family goes on vacation.
    Strongly Agree Agree Disagree Strongly Disagree

17. I would like being a veterinarian.
    Strongly Agree Agree Disagree Strongly Disagree

18. A littered environment is a bad environment for most animals.
    Strongly Agree Agree Disagree Strongly Disagree

19. Bearskin rugs are beautiful and I would love to own one.
    Strongly Agree Agree Disagree Strongly Disagree

20. Operating on pets so they can't have babies is horrible and these operations should not be performed.
    Strongly Agree Agree Disagree Strongly Disagree

21. The people I know do not all feel the same way about pets.
    Strongly Agree Agree Disagree Strongly Disagree

22. Whether or not an animal will adapt well to a human environment should be a concern when you are choosing a pet.
    Strongly Agree Agree Disagree Strongly Disagree

23. If I had a dog, I would want it to run free around the neighborhood.
    Strongly Agree Agree Disagree Strongly Disagree

24. I would like to spend some of my time telling people about the problems that face an endangered animal.
    Strongly Agree Agree Disagree Strongly Disagree

25. It's mean to leave your pet at a place that keeps animals if you can't take it on vacation with you.
    Strongly Agree Agree Disagree Strongly Disagree

26. People who are vegetarians and don't eat meat are just being silly.
    Strongly Agree Agree Disagree Strongly Disagree

27. Listening to a canary sing makes me feel happy.
    Strongly Agree Agree Disagree Strongly Disagree

28. None of the needs that animals have are similar to human needs.
    Strongly Agree Agree Disagree Strongly Disagree

29. Products made from animals should only be used if these products are a necessity for humans.
    Strongly Agree Agree Disagree Strongly Disagree

30. I think that operations to keep animals from having any baby animals would help solve the pet overpopulation problem.
    Strongly Agree Agree Disagree Strongly Disagree

31. Laws that tell us what kinds of wild animals can be kept as pets are unfair.
    Strongly Agree Agree Disagree Strongly Disagree

32. Hunting wild animals should not be allowed under any circumstances.
    Strongly Agree Agree Disagree Strongly Disagree

33. Keeping farm animals in small spaces is not good even if it increases food production.
    Strongly Agree Agree Disagree Strongly Disagree

34. It's wrong to have animals fight just so people can be entertained.
    Strongly Agree Agree Disagree Strongly Disagree

35. If a neighbor's cat scratches a baby, it's the cat's fault that the baby got hurt.
    Strongly Agree Agree Disagree Strongly Disagree

36. Destroying wild animas' habitats is always acceptable if it lead to increased food production.
    Strongly Agree Agree Disagree Strongly Disagree

Appendix D

Background Information Survey (for the younger students)
(Directly translated into English from Japanese)

1. Gender: Male Female Age_____

2. Circle the people whom you live with
Father Mother Brother (old/young) Sister (old/young)
Grandpa Grandma Other( )

3. Do you attend any other schools besides elementary school?
Piano school Calligraphy Cram School Other

4. How many good friends do you have?
None--------1--------- 2-3 ---------- more than 5 ---------- more than 10

5. Do you think you are a shy person? Do you hate/are you not good at talking in front of many people?
Yes No

6. Do you like animals? Yes No

7. Are you happy having a classroom pet? Yes No

8. Do you have a pet at home now?
□ Yes
□ No
□ I don't have a pet now, but I used to have one

9. What kinds of animal do/did you have? How long do/did you have them?
Kinds: Dog Cat Bird Hamster Other
Period: Since I was born---------3-4 years--------- about a year

10. How often do/did you play with your pet?
Always----------Often----------Sometimes----------Never-------I never have a pet
(everyday) (4-5times/week) (2-3times a week)

11. How often do/did you play with your sister/brother?
Always--------Often---------Sometimes----------Never-------I don't have siblings
(everyday) (4-5times/week) (2-3times a week)

12. How often do you help your family's task (i.e., washing dishes, clean a house)?
Everyday----------Sometimes----------Never---------Only when I have to do

13. How often do you talk/play with younger children or elder people? (i.e., grandma, grandpa, elder people live in your neighborhood)
Always---------Sometimes----------Never---------Only when I have to do

14. How often do you follow the things that your family ask you to do?
Always---------Sometimes----------Never---------Only when I have to follow

15. How often do you follow the things that your teacher ask you to do?
Always---------Sometimes----------Never----------Only when I have to follow

16. How often do you fight with your sister/brother?
Always----------Sometimes----------Never

17. What would you do if you see <u>your friends</u> are teased or attacked by someone else? Choose only 1 situation you would do if you were in the situation.
☐ I would help her/him myself even I'm alone
☐ I would go to get a teacher
☐ Even though I feel sorry for her/him, I would pretend that I didn't notice it because I would be scared
☐ I won't help because it's none of my business

18. What would you do if you see some people are teasing or attacking <u>our classroom pet</u>? (For control group: <u>animals we have at our school</u>) Choose only 1 situation you would do if you were in the situation.
☐ I would help her/him myself even I'm alone
☐ I would go to get a teacher
☐ Even though I feel sorry, I would pretend that I didn't notice it because I would be scared
☐ I won't help this animal because it's none of my business

19. What would you do if someone are teasing or attacking <u>some wandering animals (i.e., cats, dogs)</u> outside? Choose only 1 situation you would do if you were in the situation.
☐ I would help her/him myself even I'm alone
☐ I would go to get an adult who will help this animal
☐ Even though I feel sorry for this animal, I would pretend that I didn't notice it because I would be scared
☐ I won't help that animal because it's none of my business

20. What would you do if someone are teasing or attacking your home pet?
- ☐ I would help her/him myself even I'm alone
- ☐ I would go to get someone who will help my pet
- ☐ Even though I feel sorry, I would pretend that I didn't notice it because I would be scared
- ☐ I won't help because it's none of my business

* Post-test changes
Following questions will not be asked

2. Circle the people whom you live with
Father Mother Brother (old/young) Sister (old/young)
Grandpa Grandma Other( )

3. Do you attend any other schools besides elementary school?
Piano school Calligraphy Cram School Other

Following questions will be added in the post-test

6. Are you ok if you have to take all responsibility alone for a classroom pet for a day?
Yes No

18. What would you do if you saw your good friend was teasing some other friend?
- ☐ I would help her/him myself even I'm alone
- ☐ I would go to get a teacher
- ☐ Even though I feel sorry for her/him, I would pretend that I didn't notice it because I don't want to fight with my friend
- ☐ I won't help because it's none of my business

19. What would you do if you saw your good friend was teasing our classroom pet?
- ☐ I would help myself even I'm alone
- ☐ I would go to get a teacher
- ☐ Even though I feel sorry for a pet, I would pretend that I didn't notice it because I would be scared
- ☐ I won't help because it's none of my business

20. What is the your best memory throughout the year?
(Open-ended question)

Appendix E

Background Information Survey (for the older students)
(Directly translated into English from Japanese)

Gender: male female Age_____

1. Circle the people whom you live with
   Father Mother Brother (old/young) Sister (old/young)
   Grandpa Grandma Other( )

2. Do you attend any other schools besides elementary school?
   Cram school Piano school Calligraphy Other
   How often in a week? (total): 1-2 times/week---- 3-4 times/week---- Everyday

3. How many good friends do you have?
   None--------1--------- 2-3 ---------- more than 5 ---------- more than 10

4. Do you think you are a shy person? Do you hate/are you not good at talking in front of many people?
   Always---------Often-------- Rarely--------- Never

5. Do you have a pet/pets at home now?
   □ Yes
   □ No
   □ I don't have a pet now, but I used to have a pet.

6. What kinds of animal do/did you have? How long do/did you have them?
   Kinds: Dog Cat Bird Hamster Other
   Period: Since I was born---------4-5 years---------1-2 years ---------- Recently

7. Are you happy having a classroom pet? (For control group: Are you happy if you can buy a pet inside of your classroom?)
   Yes No Why( )

8. How often do/did you play with your pet?
   Always----------Often----------Sometimes----------Never-------I never have a pet
   (everyday) (4-5times/week) (2-3times a week)

9. How often do/did you take care of your pet?
   Always----------Often---------Sometimes----------Never--------I never have a pet
   (everyday) (4-5times/week) (2-3times a week)

10. How often do you play with your brother and sister?
    Always--------Often--------Sometimes----------Never--------I don't have siblings
    (everyday) (4-5times/week) (2-3times a week)

11. How often do you talk/play with elder people? (i.e., grandma, grandpa, elder people live in your neighborhood)
    Always---------Often------Sometimes---------Never------Only when I have to do
    (everyday) (4-5times/week) (2-3times a week)

12. How often do you play/take care of children younger than you?
    Always--------Often-------Sometimes-------Never--------Only when I have to do
    (everyday) (4-5times/week) (2-3times a week)

13. How often do you help your mother/family's house task (i.e., dishwashing, cleaning)?
    Always--------Often------Sometimes-------Never---------Only when I have to do
    (everyday) (4-5times/week) (2-3times a week)

14. How easy is it for you to follow the things your family members ask you to do?
    Always------Often------Sometimes-------Never------Only when I have to follow

15. How easy is it for you to follow the things your teacher asks you to do?
    Always-------Often------Sometimes------Never------Only when I have to follow

16. How often do you fight/quarrel with your brother and sister recently?
    Always--------Often----------Sometimes----------Never

17. Have <u>you</u> treated cruelty (hitting or kicking) to animals (i.e., dogs, cats)
    Sometimes----- only 1-2 times---------Never

    If you circle either "Sometimes" or "only 1-2 times", how did you feel then?
    - ☐ Excited
    - ☐ Didn't feel anything
    - ☐ I feel sorry

18. Have <u>you</u> treated cruelty to small animals (i.e., fish, insects)
    Sometimes----- only 1-2 times---------Never

    If you circle either "Sometimes" or "only 1-2 times", how did you feel then?
    - ☐ Excited
    - ☐ Didn't feel anything
    - ☐ I feel sorry

19. Have you seen your family/friends treat animals such as dogs and cats cruelly?
Sometimes----- only 1-2 times---------Never

If you circle either "Sometimes" or "only 1-2 times", how did you feel then?

- ☐ Excited
- ☐ Didn't feel anything
- ☐ I feel sorry

20. Have you seen your family/friends treated cruelty to smaller animals such as fish and insects?
Sometimes----- only 1-2 times---------Never

If you circle either "Sometimes" or "only 1-2 times", how did you feel then?

- ☐ Excited
- ☐ Didn't feel anything
- ☐ I feel sorry

21. What would you do if you see your friends are teased or attacked by someone else? Choose only 1 situation you would do if you were in the situation.

- ☐ I would help her/him myself even I'm alone
- ☐ I would go to get a teacher
- ☐ I would help only if people who were attacking were small number and looked weaker than me.
- ☐ Even though I feel sorry for her/him, I would pretend that I didn't notice it because I would be scared
- ☐ I won't help because it's none of my business

22. What would you do if someone are teasing or attacking some wandering animals (i.e., cats, dogs) outside?

- ☐ I would help her/him myself even I'm alone
- ☐ I would go to get an adults who will help this animal
- ☐ I would help only if people who were attacking were small number and looked weaker than me.
- ☐ Even though I feel sorry for this animal, I would pretend that I didn't notice it because I would be scared
- ☐ I won't help that animal because it's none of my business

23. What would you do if you see some people are teasing or attacking our classroom pet (for control group: School pet)?
    - ☐ I would help her/him myself even I'm alone
    - ☐ I would go to get a teacher
    - ☐ I would help only if people who were attacking were small number and looked weaker than me.
    - ☐ Even though I feel sorry, I would pretend that I didn't notice it because I would be scared
    - ☐ I won't help this animal because it's none of my business

24. What would you do if someone are teasing or attacking your home pet?
    - ☐ I would help her/him myself even I'm alone
    - ☐ I would go to get a teacher
    - ☐ I would help only if people who were attacking were small number and looked weaker than me.
    - ☐ Even though I feel sorry, I would pretend that I didn't notice it because I would be scared
    - ☐ I won't help because it's none of my business

* Post-test changes

Following questions will not be asked in the post-test

1. Circle the people whom you live with

   Father Mother Brother (old/young) Sister (old/young)
   Grandpa Grandma Other( )

2. Do you attend any other schools besides elementary school?

   Cram school Piano school Calligraphy Other
   How often in a week? (total): 1-2 times/week---- 3-4 times/week---- Everyday

Following questions will be added in the post-test

4. Are you ok if you have to take all responsibility alone for a classroom pet for a day?

   Yes No

22. What would you do if your saw your good friend was teasing other friend?
    - ☐ I would help her/him myself even I'm alone
    - ☐ I would go to get a teacher
    - ☐ I would help only if my friend who was attacking were weaker than me.
    - ☐ Even though I feel sorry for a friend who was teased, I would pretend that I didn't notice it because I don't want to fight with my good friend
    - ☐ I won't help because it's none of my business

23. What would you do if you saw your good friend was teasing our classroom pet?
    - □ I would help a pet myself even I'm alone
    - □ I would go to get a teacher
    - □ I would help only if my friend who was attacking were weaker than me.
    - □ Even though I feel sorry for a pet, I would pretend that I didn't notice it because I don't want to fight with my good friend
    - □ I won't help because it's none of my business

24. If there any changes in class mood (atmosphere) from last year (a year ago)?
    (Open-ended question)

25. What are the unforgettable memories through taking care of classroom pet throughout the year?
    (Open-ended question)

Appendix F

Billy and the Fireman Test (For all graders)
(Directly translated into English from Japanese)

Yuji is a boy about your age. One night his house catches fire. He and all the members of his family escape in time, but they have time to bring nothing with them. A fireman comes up to Yuji and says, "The house is going to be a total loss. Is there anything you would like us to try to get out of the house before it burns down?"

Here is a list of some of the things in the house. Choose the three things that Yuji should tell the fireman to try to save if there is time. Then explain the reasons for your choice.

1. Brand new computer game set (cost $400)
2. Yuji's baby kitten (two weeks old. He got it for free)
3. The family dog (1 year old, cost $30)
4. Mother's purse ($100 and credit cards)
5. Billy's study set (worth $100)
6. Billy's bicycle (1 year old, cost $85)
7. Dad's car keys (car is safely parked on the street)
8. Brand new TV (worth $450)
9. Little brother's hamster
10. Dad's bank card

What is the first thing to save?:_____

Why?_____

What is the second thing to save?: _____
Why?

_____

What is the third thing to save? _____

Why?_____

Appendix: G

Index of Empathy

1. It makes me sad to see a girl who can't find anyone to play with	YES NO
2. People who kiss and hug in public are silly	YES NO
3. Boys who cry because they are happy are silly	YES NO
4. I really like to watch people open presents, even when I don't get a present myself	YES NO
5. Seeing a boy who is crying makes me feel like crying	YES NO
6. I get upset when I see a girl being hurt	YES NO
7. Even when I don't know why someone is laughing, I laugh too.	YES NO
8. Sometimes I cry when I watch TV	YES NO
9. Girls who cry because they are happy are silly	YES NO
10. It's hard for me to see why someone else gets upset	YES NO
11. I get upset when I see an animal being hurt	YES NO
12. It makes me sad to see a boy who can't find anyone to play with	YES NO
13. Some songs make me so sad I feel like crying	YES NO
14. I get upset when I see a boy being hurt	YES NO
15. Grown-ups sometimes cry even when they have nothing to be sad about	YES NO
16. It's silly to treat dogs and cats as though they have feelings like people	YES NO
17. I get mad when I see a classmate pretending to need help from the teacher all the time	YES NO
18. Kids who have no friends probably don't want any	YES NO
19. Seeing a girl who is crying makes me feel like crying	YES NO
20. I think it is funny that some people cry during a sad movie or while reading a sad book	YES NO
21. I am able to eat all my cookies even when I see someone looking at me wanting one	YES NO
22. I don't' feel upset when I see a classmate being punished by a teacher for not obeying school rules	YES NO

Appendix: H

Teacher's questionnaire
(Directly translated in English from Japanese)

School Name_____ Class _____

Teacher's Name _____

What kinds of pet do you have in your classroom? _____

When did you start to have a classroom pet? _____

Today's date _____

Please answer following questions with using this rating scale.

1	2	3	4	5
Strongly disagree	Disagree	Not sure	Agree	Strongly agree

1. Having a classroom pet was beneficial to my students _____
2. Having a classroom pet was a lot of extra work and was not worth to have _____
3 I would like to have a classroom pet next year too _____
4. Having a classroom pet only beneficial to a small number of students _____
5. What were the most difficulties to have a classroom pet?

6. What was the most benefit having a classroom pet?

7. Please list the kinds of changes in students that you noticed throughout the year.

8. Please write any comments/suggestions you have.

9. Please answer attached questionnaires for each student

Thank you.

Appendix I

Teacher's questionnaire: Student rating
(Directly translated into English from Japanese)

Student's name _____

1. What were the engagement levels (i.e., playing with, talking to) when students have a classroom pet at the **BEGINNING**?

1	2	3	4	5
Very weak	Weak	Average	Strong	Very Strong

2. What are the engagement levels **NOW**? (End of school year)

1	2	3	4	5
Very weak	Weak	Average	Strong	Very Strong

3. How often does this student take care of a pet when s/he has a responsibility?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

4. How often does this student take care of a pet voluntarily? (without being forced by someone else)

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

For questions that follow, we consider empathic behaviors to include; cleaning cage (without being forced), express concern for food or health, and other behaviors that are benefit to animals.

5. How often did this student show empathic behaviors (defined above) toward the classroom pet at the **BEGINNING**?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

6. How often does this student show empathic behaviors toward a classroom pet **NOW**?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

7. How often did this student show empathic behaviors toward peers **BEGINNING**?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

8. How likely does this student show empathic behaviors toward peers **NOW?**

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

Appendix J

Test-Retest Reliability of Background Information Survey (The younger students)

Item	Alpha (α)
4. How many good friends do you have?	α = .86 (*N* = 69)
5. Do you think you are a shy person?	α = .77 (*N* = 66)
6. Do you like animals?	α = .72 (*N* = 68)
7. Are you happy if you can have a classroom pet?	α = .88 (*N* = 69)
10. How often do/did you play with your pet?	α = .86 (*N* = 64)
11. How often do/did you play with your sister/brother?	α = .86 (*N* = 68)
12. How often do you help your family's task?	α = .79 (*N* = 69)
13. How often do you talk/play with younger children or elder people?	α = .44 (*N* = 67)
14. How often do you follow the things that your family asks you to do?	α = .51 (*N* = 66)
15. How often do you follow the things that your teacher asks you to do?	α = .83 (*N* = 66)
16. How often do you fight with your sister/brother?	α = .81 (*N* = 61)
17. What would you do if you see your friends are teased or attacked by someone else?	α = .71 (*N* = 66)
18. What would you do if you see some people are teasing or attacking animals we have at our school?	α = .57 (*N* = 65)
19. What would you do if someone are teasing or attacking some wandering animals (i.e., cats, dogs) outside?	α = .66 (*N* = 66)
20. What would you do if someone are teasing or attacking your home pet?	α = .73 (*N* = 63)

Test-Retest Reliability of Background Information Survey (The older students)

Item	Alpha (α)
3. How many good friends do you have?	α = .87 (*N* = 27)
4. Do you think you are a shy person?	α = .80 (*N* = 27)
7. Are you happy if you can buy a pet inside of your classroom?	α = .32 (*N* = 27)
8. How often do/did you play with your pet?	α = .85 (*N* = 27)
9. How often do/did you take care of your pet?	α = .77 (*N* = 27)
10. How often do you play with your brother and sister?	α = .93 (*N* = 27)
11. How often do you talk/play with elder people?	α = .63 (*N* = 27)
12. How often do you play/take care of children younger than you?	α = .44 (*N* = 27)
13. How often do you help your mother/family's house task?	α = .24 (*N* = 27)
14. How easy for you to follow the things your family members ask you to do?	α = .68 (*N* = 27)
15. How easy for you to follow the things your teacher asks you to do?	α = .56 (*N* = 27)
16. How often do you fight/quarrel with your brother and sister recently?	α = .94 (*N* = 27)
17. Have you treated cruelty (hitting or kicking) to animals (i.e., dogs, cats, and rabbit)	α = .88 (*N* = 27)
17a. If you circle either "Sometimes" or "only 1-2 times", how did you feel then?	α = .10 (*N* = 27)
18. Have you treated cruelty to small animals (i.e., fish, insects)	α = .56 (*N* = 27)
18a. If you circle either "Sometimes" or "only 1-2 times", how did you feel then?	α = .93 (*N* = 27)
19. Have you seen your family/friends treat animals such as dogs and cats cruelly?	α = .45 (*N* = 27)
19a. If you circle either "Sometimes" or "only 1-2 times", how did you feel then?	α = .54 (*N* = 27)
20. Have you seen your family/friends treated cruelty to smaller animals such as fish and insects?	α = .50 (*N* = 27)
20a. If you circle either "Sometimes" or "only 1-2 times", how did you feel then?	α = .48 (*N* = 27)
22. What would you do if you see your friends are teased or attacked by someone else?	α = .78 (*N* = 27)
23. What would you do if someone are teasing or attacking some wandering animals (i.e., cats, dogs) outside?	α = .83 (*N* = 27)
24. What would you do if you see some people are teasing or attacking our classroom pet (for control group: School pet)?	α = .53 (*N* = 27)
25. What would you do if someone are teasing or attacking your home pet?	α = .57 (*N* = 27)