Companion Dogs: Helping Families of Children With and Without Autism

by

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Abstract

To date, research investigating the effects of companion dogs in families with children is scarce (Walsh, 2009), and it is even more scarce for families of children with Autism Spectrum Disorders (ASD). The present study investigated the effects of companion dogs in families with and without children with ASD. Twenty families were interviewed about children's and parents' interactions with their dogs. The analyses were based on the Grounded Theory (Glaser & Strauss, 1967). Positive and negative effects of companion dogs were related to the core category, *match*, which represented the fit between *dog characteristics* and the *characteristics of children and parents*, respectively. A good *match* resulted in more benefits for family members. *Dog knowledge*, *expectations*, and *family stages* moderated *match*. Overall, families with children with ASD experienced more positive effects (e.g., direct and indirect social support). Theoretical and applied implications of these findings are addressed.

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Introduction

“We sat in bed, mesmerized by what was going on in the lounge downstairs... We’d never heard our son play so verbally or joyfully before with anyone, either human or animal.” (Gardner, 2008, p. 46). As concluded by Gardner, their companion dog had a strong impact on their child with Autism Spectrum Disorders (ASD), and consequently on them. Despite many anecdotal examples of this kind, and despite evidence that presence of companion dogs is associated with benefits for typically developing children and adults (e.g., Walsh, 2009), scientific research investigating the effects of companion dogs on families having children with and without ASD is scarce.

Even though the importance of companion animals is increasing in North American families (Grier, 2006) the role of companion dogs in family settings is not clearly understood (e.g., Cain, 1983). To date, little to no research has investigated the variables that are conducive of a better relationship between companion dogs and children with ASD, and between companion dogs and their families. Further, no studies have yet addressed whether the role of companion dogs is similar in families with typically developing children and in families with children with ASD.

The goal of the present research was to investigate the effects of companion dogs on families with and without children with ASD, as well as provide a theoretical framework explaining the effects of dogs, and the factors contributing to these effects. I chose families because families provide the opportunity of separately investigating the interactions between women, men, and children with the same companion dog.

A qualitative method, Grounded Theory (Glaser & Strauss, 1967), was deemed best suited for this project due to the lack of prior research, and because of the numerous

variables potentially involved.

Before describing the present study, the existent literature is reviewed. The literature review was drawn from a multidisciplinary base (e.g., psychology, sociology, ethology, zoology, social work, nursing, cultural anthropology, medicine, veterinary medicine). First, a brief history of human-animal interactions is presented, followed by the main theoretical frameworks for human-animal interactions. Second, studies of the effects of companion dogs on adults and children are reviewed for typically developing individuals. Third, characteristics of ASD are considered and the effects of ASD on affected children and their families. Lastly, the very limited literature that examines the influence of therapy, service, and companion dogs¹ on children with Autism Spectrum Disorders and their parents is reviewed.

Companion Animals

Recently, the role of companion animals, especially companion dogs, has changed from working aids (e.g., herding dogs) to companions. Guardians of companion animals are increasingly becoming more implicated in their welfare, as suggested by the numerous websites dedicated to companion animals (e.g., Dogswise.com). Further, guardians are also willing to spend more money on them as suggested by the increase in the industry providing accessories for companion animals- \$45.4 billion in 2009, up from \$17 billion dollars in 1994 (APPA, 2009).

¹ For the purpose of this thesis, the term *therapy dogs* encompass dogs doing therapy work (i.e., assisting professionals such as psychologists) as well as dogs who enrich certain environments through their presence (i.e., dogs who visit schools, hospitals, etc). Service dogs are dogs purposefully trained to perform certain jobs/services for their guardians who have a specific disability or impairment (e.g., guide dogs for the blind, autism dogs). The term *companion dogs* describes dogs, without any special training designed to benefit people, living with people inside or outside the homes.

In conducting the literature review, it became apparent that among human-animal relationships, the human-canine relationship has been investigated the most. This makes sense as dogs were among the first domesticated animals, and dogs are the only species heavily genetically modified by people to serve different purposes and functions based on our desires and because they live so intimately within households.

From historic times, dogs were regarded positively and had a special role, such as emblem of a Sumerian goddess, and dog healers for the dogs living in temple (Dale-Green, 1966; Locke, 1699 as cited in Serpell, 2006). Later, dogs were valued for their help in guarding properties, herding, hunting, for their ability to entertain their guardians, and for their ability to provide physical and psychological comfort (Walsh, 2009). Recently, there has been an overall change in attitude towards companion dogs. It is common today that dogs are considered to be members of the family, with guardians referring to them as their babies, greeting them before other family members and allowing them to sleep in their beds (APPA, 2009). These changes are also reflected in how the dogs are talked to, how they are greeted after being absent for a period of time, as well as in how guardians talk to others about their companion animals. The change in the perception of dogs' role coincided with intensified research of human-animal interactions, partially fueled by recognition of the benefits associated with presence of companion animals.

In conclusion, companion animals have gained a prominent role in our lives, and dogs are the most sought-after companion animals in Western cultures. Although the literature on human-animal research is expanding, and researchers are identifying many beneficial effects associated with presence of companion dogs for people, there are still

numerous questions related to the underlying mechanisms of how we benefit from the presence of companion dogs. One possible reason for the lack of research in this area is the focus on specific effects of animals on people, at the detriment of a comprehensive theoretical explanation. An overview of the current theoretical explanations for the connections between people and companion animals will be presented next.

Theoretical Directions in Human-Animal Research

Human-animal research is an interdisciplinary field, a field that lacks a unified theory explaining the why and how of the relationship between companion animals and us. This could be due to the multidisciplinary approach to this field with its multitude of interests and opinions. Nevertheless, the diverse views represented by the diverse fields of research also contribute by providing a rich perspective and multifaceted understanding. Although numerous studies have investigated the effects of companion animals, the theoretical foundations for these studies vary. The three most popular theories to explain the effects of companion animals on humans are the *biophilia* hypothesis, the *social support* theory, and the *human-animal bond* theory.

Biophilia hypothesis. Wilson (1984) hypothesized that through evolution the human brain became increasingly hardwired to notice animals and other live stimuli in the environment. Wilson elaborated this idea based on our capacity to distinguish early on the difference between living beings and inanimate objects. Kahn (1997) further suggested that children are much more attuned to living beings than adults are because children are more open to new experiences, while adults' perception of animals is influenced by past experiences.

Although the *biophilia* theory remains popular, it has been criticized because it is difficult to test, and because it is difficult to separate the biological and cultural influences on human-animal interactions (Beck & Katcher, 2003). Another criticism of *biophilia* is that unlike *biophobia*, which is fear of living beings, *biophilia* has not been accepted in the literature as being innate and evolutionary based (e.g., Simaika & Samways, 2010). *Biophobia* has an evolutionary base because it is in people's interest to fear large predators or venomous creatures.

However, there are similarities between *biophilia* and *biophobia*, such as the fact that humans respond better to animate beings versus inanimate things. Concerning *biophobia*, Simaika and Samways (2010) suggested that humans are concerned with the unpredictability of animals. For example, people fear more predators and their movement rather than the inanimate objects that might hurt them (e.g., fangs). Similarly, it could be implied then that people respond better to likeable alive animals versus similar inanimate toys, also due to their unpredictability.

Kidd and Kidd (1987) investigated the reaction of children aged six to 30 months of age children to their own companion animals versus life-like battery operated animals. The children followed, reacted more vocally and smiled more often to the live animals, than they did towards the battery operated dog and cat. This study provided proof of the ability of children to be more responsive towards animals than to objects that moved and looked like animals.

Recent research suggests that there is a biological connection between companion dogs and humans, which supports the *biophilia* hypothesis. Nagasawa, Kikusui, Onaka and Ohta (2009) observed that the level of urinary oxytocin in guardians of companion

dogs increased after their dogs gazed at them. Oxytocin is a hormone involved in reproduction, as well as in social behaviours (Lee, Macbeth, Pagani & Young, 2009). This suggests that humans react unconsciously to social cues initiated by companion dogs. Further, Kruger, Trachtenberg and Serpell (2004) have suggested that this hypothesis could provide an explanation for the beneficial effects of therapy animals on humans during their visits. For example, people smile and relax from the mere presence of animals. Although more research is needed, such findings suggest that presence of companion animals in therapeutic and other settings may benefit children with ASD.

It is possible that some of the anecdotal evidence presented in biographical novels of children with ASD responding to companion dogs could also be explained by this theory. For example, in the 2008 book *A Friend Like Henry*, Nuala Gardner described the interactions of her low-functioning son with ASD, Dale, with dogs. Although Dale never initiated an interaction with another person, he initiated interactions with the two dogs of a family friend the first time he saw them. Similarly, the mother of a boy with ASD reported to the author (C. C.) that the first words of her son were the names of the family dogs (personal communication, 2008). Alternatively, it is possible that this theory does not apply at a general level, but rather at an individual level- for example, some individuals respond better to companion animals than other individuals do.

Social support hypothesis. Cobb (1976) suggested that a function born out of social relationships is social support, defined as “information leading the person to believe that he is cared for and loved, valued and esteemed, and is important in a network of mutual obligation and communication” (p. 300). Four factors of social support were proposed by Cobb: (1) emotional support, defined as comfort and caring for a person, (2)

practical support, defined as practical help provided to deal with a specific issue, (3) esteem support, defined as reaffirmation of self-respect when faced with a threat to it, (4) informational support, defined as cognitive information that is helpful in evaluating a situation. Cobb proposed that social support based on social relationships could improve one's health by accelerating illness recovery or by guarding against anxiety and other illnesses.

Human-animal relationships can also provide social support to people, as proposed by McNicholas and Collis, 2006. They suggested that companion animals might offer social support to people in two ways, *directly* and *indirectly*. Directly, companion animals may provide their guardians with support that supplements or replaces human support, and they can provide support in situations in which human support is not available (e.g., persons living alone, or persons with a limited social circle). Companion animals can also buffer fluctuations in support, which are characteristic to human sources (e.g., for persons moving to a new place). Most companion animals, in particular dogs, are always ready to interact with their guardians. In some cases, guardians may experience embarrassment or other feelings that prevent them from looking for human support, but they may find it easier to express their feelings in the presence of their companion animals.

Indirectly, companion animals can act as social lubricants “providing a means of facilitating interactions with other people, leading to a sense of belonging and social integration, and as a platform for forming deeper, more permanent relationships” (McNicholas & Collis, 2006, p 57). Numerous studies support this idea. For example, Wells (2004) suggested that dogs facilitate social interactions for adults by mediating

conversation opportunities in public settings. She observed that people interacted more when the experimenter was accompanied by a Labrador Retriever puppy than an adult of the same species or a Rottweiler, although all three dogs facilitated conversations between the experimenter and the passers-by. The dogs facilitated the spontaneous conversations that arose between the experimenter and passerby. They acted as social lubricants and seemed to minimize the potential awkwardness of talking to strangers in park settings. An interesting aspect of this study was that two characteristics of the dogs (i.e., age and puppy like features) moderated the interactions between experimenter and passer-by. This suggests that while all dogs may provide some form of indirect support, some of them are better suited to provide this form of support than others. In addition, it suggests that dogs need to be considered at an individual level, rather than at the species level.

Human-animal bond. Researchers exploring human-animal relationships have tended to focus on physical and psychological benefits associated with bonding between people and their companion animals. Bowlby (1969) suggested that attachment provides safety to the human infant based on maintaining proximity to a specific person recognized as a safe base, which allows the infant to explore the environment. Attachment² to animals has been defined and investigated in multiple ways; some definitions are closer to the *human attachment* theory, while others deviate from it. While some researchers suggested that the positive feelings developed by people towards their companion dogs are due to a bond that is similar to the human mother-infant attachment (e.g., Serpell, 2003), others suggested that the attachment to companion animals is an emotional connection felt by the guardian, but not necessarily by the animal

² In this thesis, the words *bond* and *attachment* are used interchangeably, denoting closeness to animals.

(Budge, Spicer, Jones & St. George, 1998). Similarly, Keil (1998) suggested that human-animal attachment is hierarchical, with animals always being in a lower social rank.

In general, compared to other companion animals, dogs interact the most with their guardians. A few studies have looked at their behaviour towards their guardians, and found that dogs' behaviour resembles that of humans when interacting with people. Many companion dogs display the same proximity-seeking behaviour as children do when securely attached to their caregivers (e.g., Topál, Miklósi, Csányi & Dóka, 1998). Dogs are able to share social cues (joint attention) by looking at humans when faced with a novel or difficult situation (Miklósi et al., 2003), and they can recognize familiar human faces among strangers using both visual and auditory cues (Adachi, Kuwahata & Fujita, 2007).

The fact that the social and cognitive abilities of companion dogs seem to somewhat overlap with the social and cognitive abilities of people suggest that people can respond to social signals from dogs, and vice-versa. If we assume that companion dogs have the ability to understand the body language of the children, than they could enhance children's interactions with them by responding appropriately to them. However, as previously mentioned, it is important to recognize the characteristics of dogs at the breed and individual level (e.g., certain herding breeds are biologically more inclined to maintain contact with people). Further, if the children are emotionally attached to their dogs, it is possible to expect that they would be more socially investigative in dogs' presence.

In summary, the *biophilia* hypothesis, the *social support* theory, and the *human-animal bond* are the most popular theoretical frameworks used to account for observed

beneficial effects of companion dogs on people. While the *social support* theory and human-animal bond are arguably the most plausible and useful explanations in the present context, *biophilia* theory has gained recent support based on the few studies investigating biological changes in people interacting with their companion dogs.

In the next sections, the literature to date focuses on children or adult samples associated with the presence of companion animals. I will explore first the effects of companion animals on adults, and then on typically developing children.

Adults and Companion Animals

Presence of companion animals has been associated with diverse benefits, including health benefits and social support for adults. However, before presenting a synopsis of the literature, two important points must be addressed. First, the generalizability of findings from community samples to parents of children with ASD may be limited, especially due to limited descriptions of participants, or of the context in which the studies were conducted. Such samples may include individuals with mild to moderate daily stress levels, but the parents of children with ASD are known to have very high levels of daily stress (Heiman, 2002). Ideally, this population should be compared to another highly stressed group. Second, due to the multidisciplinary approach to human-animal research, researchers have investigated diverse aspects of human-animal interactions. This literature does not follow a logical trajectory, or follow any single issue to a conclusion.

The presence of companion animals has been associated with the following beneficial health outcomes in healthy adults: (1) lower levels of blood pressure and cholesterol in older adults (Anderson, Reid & Jennings 1992), (2) decreased blood

pressure for participants who have petted a dog (Baun et al, 1984), (3) moderated stress and anxiety levels of participants when a dog was introduced into the room during a stressful experiment (Friedmann, Locker & Lockwood, 1993), (4) and higher levels of physical activity for companion animal guardians versus non-guardians (Thorpe et al., 2006). However, the generalizability of these findings is limited by the facts that companion animal guardians are not themselves homogenous, nor are the companion animals homogenous in their characteristics. That is, there is a lot of difference between the physical abilities of people of same age, as well as between the needs of certain breeds of dogs. The directionality of these effects is also unclear given the quasi-experiments. For example, in Thorpe and colleagues' (2006) study, it is possible that the level of physical activity of companion animal guardians was related to the overall physical health of guardians. In other words, healthy people may be more likely to decide to get a companion animal. To deconfound this, one would need to conduct a longitudinal study in which matched non-guardians on health and physical activity are assigned companion animals for a period of time. This would allow researchers to observe whether presence of companion animals influenced the health outcomes of the actual guardians. However, due to ethical and practical considerations, it is very unlikely that this type of research will be conducted.

Friedmann and colleagues (1980) were the first to investigate medically compromised adults. Guardians of companion animals who were hospitalized for heart related ailments had better survival rates than non-guardians. Friedmann and Thomas (1995) subsequently replicated this study, although Parslow and Jorm (2003), using the same methodology, were not able to replicate the results. Similar to the study conducted

by Thorne and colleagues (2006), a possible explanation for the conflicting results is that healthier people may be more likely to choose to have a companion animal. Because random sampling cannot be applied in this type of research, sample characteristics and lack of generalizability are always going to be a problem for studies of health effects.

The following studies investigated the effects of companion animals as social support. Allen, Blascovich, Tomaka and Kelsey (1991) first suggested that companion animals provide emotional and social support to a sample of widowed women. The women reported that immediately after losing their husbands they preferred to be with their dog than with family members or friends, in part because of the perceived nonjudgmental relationship. Similarly, Zasloff and Kidd (1994) observed that single women living with a dog were more attached to their companion dog than were women living with other people and a dog. More recently, Katz (2003) observed that companion dogs were reported to be a source of emotional support by people who have lost a relative, and Becker and Kushner (2006) found that dogs provided perceived support for depressed adults of both sexes. Participants in the latter study appreciated dogs' physical presence and also the feeling of unconditional love. Such studies support the idea that companion dogs provide social support to their adult guardians inside the home.

Guardians may perceive social support from companion dogs outside their homes as well. For example, Wells (2004) found that dogs facilitated social interactions between adults by mediating conversation opportunities in public settings. In this instance, the dogs were acting as social lubricants, facilitating interactions between people.

In investigating the effects of companion animals on people, this body of literature has primarily focused on physical health (e.g., recovery after surgery, walking, stress reduction) and on social support (e.g., companionship, facilitation of social interaction). A few factors have been identified as influencing these relationships. Factors such as size of a dog, puppy like features (e.g., round eyes) and the extent of people's bond to their companion animals moderated the interactions between guardians and their companion animals, both inside the home and outside. These findings were limited, to a degree, by methodological problems (e.g., use of quasi-experiments in which the participants cannot be randomly selected and assigned), and by a focus on the potential benefits to people, rather than a dual approach that include the companion animals. However, the findings to date are sufficient to conclude that a multifaceted theory of social support should include companion animals.

Children and Companion Animals

As early as 1699, John Locke suggested that caring for animals helps children develop feelings of responsibility and empathy (Locke, 1699; cited in Serpell, 2006). However, the relationship between children and their companion animals has received relatively little attention from researchers. This is perhaps surprising given the large number of companion animals in today's families.

Melson (2001) suggested that companion animals are often an important part of children's environments. The world of children is typically full of animals, including live animals, plush animals, cartoons, or animals in stories and movies. Thus, it is assumed for the purpose of the present project that animals are a part of children's ecological framework, and that their role in child development deserves to be explored.

Several studies have looked at socio-emotional benefits (e.g., affection, responsibility, emotional support, pro-social behaviours, friendship) and cognitive benefits (e.g., learning about their environment, language development) of companion animals using child samples. These studies will be considered next.

Researchers have looked at the socio-emotional benefits of companion animals on children (e.g., affection, responsibility, emotional support, empathy, pro-social behaviours, friendship). Fifield and Forsyth (1999) investigated via questionnaires the effects of companion animals on 312 children, aged eight to 12 years old. They concluded that the advantages of having a companion animal were that the children learned about responsibility, respect, affection, and companionship. Similarly, Bryant (1985) found that seven-to 10-year olds reported talking and sharing their emotions with their pets as they would do with their siblings. In a follow-up study, Bryant (1990) found that eight-to 12-year olds children reported receiving support from their companion animals manifested as affection, both received and offered, and emotional support in distressing situations.

Melson (1990) suggested that the child-companion animal relationship, and the bond between them, should be investigated based on the following variables: (1) knowledge about the companion animals; (2) emotional closeness; (3) interest in companion animals; (4) and activities and time spent together with the companion animals. While the existent literature considered some of these aspects, it failed to consider the reciprocity of behaviours between children and their companion animals. Investigating both the behaviour of children and the behaviour of their companion

animals will better illustrate how the children are influenced by the presence of companion animals.

Similar to the indirect social support in the adult population, dogs have also been shown to facilitate social interactions for children. Mader, Hart and Bergin (1989) found that children in wheelchairs interacted substantially more with unknown people to them when accompanied by a service dog than when alone (service dogs are dogs specifically trained to serve a certain purpose). This is an important finding because one of the main causes of social isolation for families with children with ASD is the constant scrutiny from strangers in public settings due to the different behaviours of the children with ASD.

In summary, there is evidence that companion animals provide direct and indirect social support to typically developing children of different ages. Due to the quasi-experimental design of the studies employed, it is unknown whether presence of companion animals actually caused those effects. Therefore there is a need for more research.

The second outcome domain that has been studied is children's cognitive and social development. Katcher and Wilkins (1993) suggested that presence of animals is conducive of human speech, because language is used to warn others about possible sources of food or danger. Further, Katcher and Wilkins suggested that children's response to animals "seems to remain intact even when social and emotional responses to other human are compromised by a variety of structural or functional disorders." (p. 185). This suggestion implies that children with impaired social skills could still benefit from presence of companion animals.

Children learn about their surroundings through their senses. The following studies will briefly cover children's preference towards companion animals versus objects or people. Kidd and Kidd (1987) investigated via direct observations differences in the behaviour of young children between six and 30 months of age towards their own companion dog or cat versus a battery-operated dog or cat toy. The babies interacted more with the animals than the toys, which was evident in certain behaviours, such as touching, following, and vocalizing. Further, the children interacted more with companion dog than with companion cat. Children's preference for companion dogs might be due to dogs' general ability to interact with people, while companion cats typically display more independent behaviours. That is, in general, cats interact with children independent of children's wishes.

Ricard and Allard (1992) investigated via observations the reaction of nine-months-old children to three stimuli: a live rabbit, a moving wooden turtle that made noises and had flashing lights, and an unknown adult woman. They controlled for object novelty by not using companion animals to which the children were habituated. In their study, the children interacted with the live animal through touching and looking more frequently than with the adult woman and the toy. Thus, they replicated the findings of Kidd and Kidd (1987). Together, the two studies provide evidence that children are attracted to companion animals (e.g., dogs, cats, rabbits), supporting the biophilia hypothesis. Alternatively, the babies and the young children participating in these studies reacted more to the live animals due to their movement, reactions, and different expressions in comparison with the facial expressions of humans or to the noises and lights of the toys involved in these two studies. Regardless of their motivation, children

ultimately interacted more with animals, suggesting that companion animals could provide an environment conducive of learning for young children.

Although no longitudinal research investigating the child-companion animal relationship across developmental ages was found in this literature review, the following studies present a cross-sectional view of this relationship.

In a study of 300 children, aged three to 13 years old, Kidd and Kidd (1985) observed children's attitudes towards their companion animals. They concluded that with age, the children progressed emotionally from an egocentric perspective to an empathic and perspective-taking one. An exception to this was that 25% of 13-year olds children reported that aversive methods (i.e., physical punishment) were the best way to change animals' behaviour. A possible explanation of this result could be provided by the cultural framework of that period. Training methods in that period were based on aversive methods, such as using collars designed to induce pain when yanked. Thus this subgroup of children could have been, in fact, more knowledgeable of training methods rather than manifesting non-empathetic behaviour. This suggests that environment influences also play a role, in addition to biological age.

Qualitative measures allow for a greater level of inquiry due to their flexibility, and sometimes provide new, unexpected information, which can expand the researchers' understanding of the respective topic. Filiâtre, Millot and Montagner (1986) analyzed the interaction of three to five years olds with their companion dogs based on videos recorded in home environments. They concluded that the following factors influenced these interactions: (1) size of the family - there was more interaction in single child families; (2) age of the child - young children interacting more aggressively with their

companion animals; (3) dog characteristics - older, larger female dogs in the home since or before the child's birth interacted more with the children than younger, smaller female dogs; (4) and an interaction between the latter two factors- older, larger females interacted more with older children. They argued that frequent physical contact (e.g., petting the dogs) contributed positively to children's emotional and social development. For example, isolated children can feel secure in the presence of their dog, and the communication between them could contribute to child's social development. The findings from this study suggest that researchers should investigate not only the characteristics of children, but also the characteristics of their companion animals and the interaction between these two variables in order to better understand the child-companion animal relationship. This is likely to be especially important for research involving children with ASD. This is a heterogeneous disorder, children with ASD vary markedly in intelligence, verbal ability and social behaviours. Thus, it is important to examine closely each child - companion animal relationship before looking at the group level.

Kidd and Kidd (1990) conducted interviews using open-ended questions in order to investigate differences in the perception of high-school students and grade school students related to presence of companion animals. They compared 50 high-school students with the previous study investigating grade school children (Kidd & Kidd, 1985). They concluded that: (1) 86% of the sample thought that the best way to show love and affection to their companion animals was to offer them proper physical and emotional care; (2) high school students displayed a better understanding of animal behaviour (e.g., excited behaviour after separation was more likely to be interpreted as greeting behaviour) than grade school children; (3) more high school children, 92%,

versus 32% of grade school children reported psychological benefits associated with their companion animal (e.g., friendship, unconditional love, emotional support); (4) more high school children reported being closer to their companion animals than grade school children. However, the grade school children from the 1985 study were much more involved than the high-school students in the daily caretaking of their companion animals (e.g., walking, feeding, etc). A possible explanation of the 1990 findings could be that high school students spend more time with their peers, and thus have less time for their companion animals. Logically, age influences the child-animal relationship; as children mature, they are more able to understand the needs of animals, and perhaps spend less time with them as a result of a more complicated social environment.

Another important aspect of children's interactions with animals is parental presence. According to Bronfenbrenner (1979) ecological framework, parents play an important role in child's development. Parents are the decision makers in families, and in most instances, they are the main caretakers of companion animals. In fact, without parent consent, companion animals cannot be present in children's lives. Not surprisingly, Magnuson-Martinson and Page (1986), cited in Kidd and Kidd (1990b), reported that typically developing children's attitudes towards companion animals were influenced by the attitudes of their parents. In addition, the authors reported that the attitudes of children towards companion animals were more favorable than the attitudes of their parents, suggesting that factors other than parental attitudes also influence children's relationships with their companion animals.

Using parental report with a sample of 700 children, Kidd and Kidd (1990b) supported the findings of Magnuson-Martinson and Page (1986). Kidd and Kidd

reported that parents who were highly attached to the companion animals had children who were also highly attached to their companion animals, and parents less attached to their companion animals had children less attached to their companion animals. More recently, Colțea (2008) replicated these findings in a sample of nine families of children with ASD. Even in a small sample, parents with stronger bonds to their companion dog had children with stronger bonds to their companion dog, suggesting this is a powerful effect. These few studies provide evidence that parental attitudes influence both typically developing children as well as children with ASD.

Attachment to dogs in the above studies was measured via questionnaires. The items quantified participants' perception of their relationship to their companion dogs (e.g., I believe the dog is my child's best friend; I often talk to other people about the dog). In addition to using this type of questionnaires, Colțea (2008) attempted to measure participants' attachment to their companion dog based on observable behaviours (e.g., How often does the dog follow you)- both methods came to the same conclusion, suggesting that, at least in that small sample, participants' perception of their relationship with their dog is accurate.

At this time, more research is needed in order to understand the process through which the parents influence children's attitudes. Presently, it is unknown whether the parents influence the children directly (e.g., by teaching them how to interact with the companion animals), whether the companion animals in those homes had some characteristics that influenced guardians' attachment, or a combination of both. These findings show that it is important to investigate child development within a larger

context, and that it is important to investigate bidirectional effects between children and companion animals.

From the above review, several factors were identified as influencing the child-companion dog relationship: (1) child age; (2) dog age; (3) type of companion animals-dogs being more frequently associated with benefits than other animals.

In the preceding section for adults' interactions with companion animals, dogs were shown to facilitate social interactions (i.e., dogs acted as social lubricants, facilitating conversations between guardians and passersby). Similarly, dogs have also been shown to facilitate social interactions for children in one study. Mader, Hart and Bergin (1989) found that children in wheelchairs interacted substantially more with other people when accompanied by a service dog than when alone. This study was conducted in two settings: (1) at school; (2) and at a shopping mall. The children experienced more social interactions at the mall, where strangers that otherwise would not have been noticed were more likely to stop to talk to them or to their dogs. This finding needs to be replicated with companion dogs, who unlike service dogs are not trained for specific tasks.

In conclusion, there is considerable evidence that animals are a part of the ecological framework of children. The reviewed literature suggests that the presence of companion animals influences the emotional, cognitive, and social development of neurotypical and wheelchair-bound children. In addition, factors such as child age and the physical and behavioural characteristics of the animals (e.g., size, gender) may influence children's relationship with their companion animals.

The previous review on the effects of companion animals, especially dogs, on typically developing children and adults highlighted the potential benefits registered by them from the presence of the companion dogs. However, there is a need to explore the benefits of companion dogs in other populations, such as families of children with ASD. Parents in these families experience more stress and difficulties in their daily lives than families with typically developing children, and thus, it is possible that their interactions with their companion dogs would be different. In addition, it is unknown whether children's with ASD interactions with their companion dogs is qualitatively different from the interactions of typically developing children. Typically the research concerning children with ASD and animals has focused mostly on the effects of therapy or service dogs (e.g., Burrows, Adams & Spiers, 2008), and less on the effects of companion dogs. The following section reviews the main characteristics of children with Autism Spectrum Disorders, and the influence of these disorders on families.

Characteristics of Autism Spectrum Disorders

According to the Diagnostic and Statistical Manual of Mental Disorders IV, Text Revision (DSM-IV-TR, 2000), there are five Pervasive Developmental Disorders (PDD): Autism, Asperger's 's syndrome, Rett syndrome, Childhood Disintegrative Disorder and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS).

Rett Syndrome and Childhood Disintegrative Disorder are regressive and have degenerative characteristics. Typically, in the existent literature, these two disorders are investigated separately from the other Pervasive Developmental Disorders because of their different characteristics (e.g., Norris, Pare & Starky, 2006). The Rett Syndrome and

the Childhood Disintegrative Disorder will not be considered for the purpose of this review.

Autism Spectrum Disorders (ASD) is an umbrella term for Autism, PDD-NOS, and Asperger's syndrome. Kogan and colleagues (2009) reported that ASD is four times more prevalent in males than in females in the United States, and that it affects one in every 110 children. This represents a 600-fold increase in the number of diagnosed children in the past 20 years. The authors suggested that a combination of more cases and earlier recognition and diagnosis account for the frequency of ASD. For comparison purposes, the prevalence of ASD in Canada is approximately one in 147 children. This affected approximately 211,140 children in 2005, rising from 69,000 in 2003 (Siklos & Kerns, 2006).

Several factors contribute to ASD. Studies investigating identical twins versus fraternal twins revealed a high prevalence of ASD in identical twins, versus fraternal twins (Rutter, 2000). Other factor could be caused by environment, such as infections contracted by either the mother or the child (Geneva Centre for Autism, 2009). Lastly, evidence of an abnormal brain overgrowth between two and four years of age for some affected children suggest a neurological factor (Courchesne, 2004). The heterogeneous manifestations and functional outcomes of ASD are unique to each individual (Valente, 2004), an observation that may reflect variable interactions between these three factors.

Typically, a diagnosis of ASD can be made between the age of two and three (Valente, 2004). The diagnosis is typically made by a team of pediatric specialists. Treatment for ASD typically focuses on one or more symptoms (e.g., problematic

behaviours, language development) and may include behavioural interventions based on the Applied Behaviour Analysis, language interventions, dietary treatments, etc.

The diagnosis of Autism requires a significant impairment in multiple domains, including social communication and interaction, language development, adaptive behaviour and age-appropriate skills, and presence of repetitive behaviours prior to the age of three (DSM-IV-TR, 2000). Asperger's is less overt and only requires at least two impairments in social communication and interaction and one symptom of repetitive behaviours. When some symptoms of Autism or Asperger's are present, but without meeting the criteria for either, a diagnosis of Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) is given.

Although the impairments of children with ASD vary in severity, what all have in common are impairments in social interaction and communication, as well as in language development (DSM-IV-TR, 2000). Typically, the communication of young children with ASD gravitates around their immediate needs, they are preoccupied by their own interests. Nonverbal children, and children with severely impaired social interaction skills may express themselves by grabbing, pulling, stretching towards unreachable objects, or by crying (Valente, 2004). Conversely, some children with ASD may have better language skills, but they do not use typically appropriate non-verbal communication in order to sustain their social interactions. Non-verbal communication is comprised of body language and facial expressions. For example, children with ASD do not typically react based on the facial expressions of others. These communication deficits make it more difficult to manage in social situations, and extend into the receptive domain, as well as the expressive domain.

Eye contact is particularly problematic among children with ASD. Failure to engage in eye contact obstructs social interactions and causes the children to miss important facial queues expressed through non-verbal communication (Geneva Centre for Autism, 2009). Until recently, findings from tests of facial recognition were interpreted as indicating that children with ASD are not attentive to social stimuli (e.g. Schultz et al., 2003). However, New and colleagues (2009) concluded that children with ASD were able to identify changes in images of people and animals, but they did not identify similar changes in images of objects and plants. A control group of typically developing children and adults showed the same preference for images of people and animals. Although the results of one study cannot be generalized to all children with ASD, they suggest that the level of social attention to people and animals of some children with ASD is similar to the typically developing population, contrary to popular belief. In addition, the results also suggest that the inattentiveness of children with ASD to social stimuli may reflect different causes than an inability to notice changes or events in their social environment. For example, it is possible that children with ASD are attentive to changes in their social environment, but maybe do not react in a typical manner, and therefore their reactions are misunderstood.

Even verbal children with ASD have difficulties interpreting social aspects of language. Wang, Lee, Sigman and Dapretto (2006) investigated the neural basis of understanding ironic language in children with ASD. Ironic language refers to statements conveying an opposite meaning to the literal meaning. They concluded that their sample of children with ASD had difficulties in understanding both abstract and ironic language. However, the children with ASD performed above chance, indicating that they did

understand some of these concepts. It is possible that these language deficits were related to other factors, such as time pressure. For example children with ASD may need more time to process abstract language. While children's social interactions may be obstructed by language interpretation problems, it is expected that their interactions with companion animals should not be affected by language deficits, both because dogs communicate by using their whole body, and because there is no pressure to respond immediately.

Other characteristics of many children with ASD are unusual and repetitive behaviours. Many children with ASD exhibit an unusual pattern of behaviours (e.g., hand flapping, toe walking), as well as specific behavioural routines to which they rigidly adhere (e.g., wearing certain clothes, dressing and undressing in a specific order). Children with ASD do not like changes to their daily schedules, and some are prone to running from their parents (i.e., bolting). This bolting behaviour is particularly problematic when the child lacks a sense of danger (Midence & O'Neill, 1999). Further, children with ASD are often highly sensitive to common sensory stimuli in their environment (i.e., light, noise, odors) and they may have intense negative reactions to these stimuli (Valente, 2004). This sensitivity negatively affects their social interactions by impeding children's with ASD ability to focus on salient information.

In summary, children with ASD have difficulties in the areas of social interactions and communication, as well as in language development and language use. The latter may be subtle, as in the case of Asperger's, or severe as in the case of Autism. Because ASD is a spectrum disorder, with considerable individual variability, researchers must account for this variability.

Family Impact of Autism Spectrum Disorders

Children with Autism Spectrum Disorders are not the only ones affected by the disorder, their families are also affected (Szatmari, 2000). More specifically, research has shown that families of children with ASD experience increased levels of stress when compared to families of children with other developmental disabilities (e.g., Sanders & Morgan, 1997). The increased stress levels of these parents are associated with the severity of children's problematic behaviour (Heiman, 2002). Stress contributes to distress and concern related to the future of the affected child, and worries about an uncertain future (Macks & Reeve, 2007). Further, for parents, caring for a child with ASD is often an intense lifelong commitment.

Bromley, Hare, Davison and Emerson (2004) suggested that another factor associated with stress in this population is the fear of failing to provide adequate services for their children. Compared to parents of neurotypical children, parents of children with ASD are faced with many complex decisions related to the treatment of their children. For example, decisions related to treatment efficacy, funding treatments, etc. In addition, these parents also face numerous impediments in accessing treatment services for their children (e.g., long waiting lists for diagnosis and for behavioural interventions).

In addition to stressors related directly to the disorder of their child, increased levels of stress for parents may also be related to perceived negative social judgments of their parenting skills (Troy, Connolly & Novak, 2007). Because children with ASD do not appear physically disabled (i.e., they do not have a visible disorder), parents of children with ASD often report that the unusual patterns of behaviours and the

inappropriate social interactions of their children are perceived by bystanders as a reflection of poor parenting skills.

Positive outcomes in reducing the stress levels for parents of children with ASD have been observed where there is strong social support. Spousal support was found to be paramount for parents with children with ASD (Anderson & Lynch, 1984). Parents of children with ASD need to believe in a better future for themselves as a couple in order to provide support to their child. Gray (2003) suggested that there are gender differences for parental stress perception, with fathers usually not experiencing firsthand the difficulties in raising the children with ASD. They experience these effects through the relationship with their spouses, because typically the mothers are the principal caregivers for children with ASD (Siklos & Kerns, 2006).

Other forms of social support for parents include support from the extended family (Hastings, 1997) and from friends by providing a sense of stability and continuance (Salovita, Itälinna & Leinonen, 2003). Another source of social support comes from community agencies running programs for children with ASD (Sanders & Morgan, 1997). These agencies provide support to parents through programs and activities designed to alleviate the effects of children's disorder.

In summary, parents of children with ASD (especially mothers) experience high levels of stress. These high stress levels are influenced by the facts that caring for children with ASD is a lifelong commitment, by difficulties in social settings (i.e., ASD is an invisible disorder that is not clearly identified by other people), and by children's symptom severity. Social support from spouses/partners, extended family, friends and governmental agencies can reduce the stress levels of parents of children with ASD.

Given the importance of social support for these families, given the recent evidence that children with ASD are attentive to animals, and given that companion animals provide social support in typically developing populations, it is logical to expect that companion animals may play an important role in these families. However, with the exception of one honours thesis regarding companion dogs as providers of social support in families of children with ASD (Colțea, 2008), the role of companion animals in these families has been overlooked.

In order to provide a context for examining the role of companion animals in families of children with ASD, the next section will cover the limited literature on the interactions between children with ASD and companion animals.

Influence of Dogs on Children with Autism Spectrum Disorders

In general, children with ASD are more responsive to animals than they are to people. Few studies have investigated the effects of live animals on children with ASD. These studies have typically investigated the role of dogs by observing children in laboratory settings, using unfamiliar animals and short-term interventions. These studies will be reviewed next.

Martin and Farnum (2002) measured pro-social behaviour and language use for 10 children with PDD-NOS, Asperger's, and Autism. The children ranged from three to 13 years. They participated in three different conditions: (1) a live dog; (2) a plush dog; (3) and a ball. The researchers observed that in the live dog condition the children talked more about and to the dog, were more focused on the "therapist" (i.e., specially trained individuals for the project), and were less distracted by their environment (i.e., they were more likely to answer the questions of the therapist). Surprisingly, developmental age

did not influence the results. This contrasts with the research concerning typically developing children, which showed that developmental age influences children's interaction with dogs (e.g., Filiâtre, Millot & Montagner, 1986). Another finding of interest in the Martin and Farnum study was that in the live dog condition, the children were more likely to provide an answer related to therapist's questions, rather than answering based on their personal interests. This finding is important, given the tendency of higher functioning children with ASD to have favourite discussion subjects from which they do not deviate. Thus, the presence of a live dog seemed to help the children's listening skills, perhaps by focusing their attention on something in the environment outside themselves.

Unlike Martin and Farnum (2002), Welsh (2009) concluded that presence of a dog and his handler did not affect joint attention for children with ASD. The joint attention behaviour (i.e., eye contact or gestures meant to direct attention) between children with ASD and other humans present (i.e., caregiver and/or dog handler) was systematically video recorded. In this study, 15 children between two and eight years of age were assigned to two conditions: a plush toy condition, and a live dog condition. The children were exposed to these conditions in familiar settings, either therapy rooms or school settings. However, the children were not familiar with the dog, and the interaction between them was static (e.g., the children and the dog were in a face-to-face scenario, not playing together). The results suggested that there was no difference between the two conditions, which contradicts Martin and Farnum (2002). Welsh concluded that the presence of a live dog did not affect the joint attention between children with ASD and their caregivers or dog's handler. While the results did not support Welsh's hypothesis,

they supported the need for individual consideration of children, dogs, and of the relationships between them.

Celani (2002) adopted a different approach when investigating the behaviour of children with ASD related to companion animals. Using the method of sorting by preference, Celani investigated the reactions of three groups of children (i.e., 12 typically developing, 12 children with ASD, and 12 children with Down syndrome) to drawings of animals, objects, and people. The children were matched for gender and developmental age (i.e., the children with ASD and with Down syndrome had a mean age of 11.0 years, while the typically developing children had a mean age of 6.0 years). Celani concluded that children with ASD were as likely as typically developing children to prefer drawings of animals over pictures of inanimate objects. However, the children with ASD did exhibit a disinterest in pictures of people. This finding confirmed that the perception of animals by children with ASD is similar to the perception of neurotypical children.

Prothmann, Ettrich and Prothmann (2009) also conducted a preference study with 14 children with ASD. Unlike Celani's (2002) study, Prothmann and colleagues presented the children with three stimuli at once: a dog, a person, and an inanimate object. The children interacted with the dog twice as much as they interacted with the person, and 16 times more than they interacted with the inanimate objects. Prothmann and colleagues speculated that the interactions with the dog represented a form of joint social engagement, similar to the social engagement observed during the interaction of typically developing children and their companion animals. This assumes that the children with ASD understood dog's behaviour as communication, and reacted positively to it.

The above four studies investigated the reactions of children with ASD towards dogs. Although small, the findings of this body of literature present a compelling case for the fact that children with ASD are responsive to dogs, perhaps supporting the *biophilia* hypothesis- that the human brain has been hardwired to notice animals and other live stimuli in an environment (Wilson, 1984).

While the above studies investigated children's perception of dogs, the following two studies investigated the beneficial effects of animals on children with ASD in therapy settings.

Redefer and Goodman (1989) studied the behaviour of 12 severely impaired children, aged 5 to 10 years, who exhibited autistic features in the presence of a therapy dog. According to the authors, the children functioned in the retarded range and displayed unusual and stereotypical behaviours- no diagnosis was mentioned. During the treatment phase, the researchers encouraged the children to interact with a dog, previously unknown to them, by modeling gradual appropriate interactions (i.e., started by touching the dogs, then playing, and later on feeding). The therapists observed children's behavior in each phase, and coded for isolation, described as activities directed at self, and social interaction, defined as either verbal or nonverbal interactions with the dog or the therapist. After the introduction of the dog in the treatment phase, the scores of social interaction increased 6.5 standard deviations from the baseline, and the children displayed less autistic behaviours (e.g., less repetitive jumping, less object spinning). The scores of isolation decreased by five standard deviations- the children displayed more socially appropriate behaviours (e.g., initiating diverse activities with the therapist, hugging the therapist, participating in games). At post-treatment, when the dog was not

present, and at follow-up, when neither the dog nor the familiar therapist was present, children's social interaction scores remained high (three standard deviations above the baseline), and isolation scores were also maintained (two standard deviations below). Although it appears that the effect of the dog tapered off in time, the children benefited from exposure to the therapy dog. The unfamiliarity of the new therapist might have influenced the follow-up scores, given that children with ASD do not generalize well to new conditions, such as a new therapist.

In another study investigating the effects of animals in therapeutic settings, Sams, Fortney and Willenbring (2006) investigated language use and social interaction of 22 children with ASD, aged seven to 13 years. The children were presented with two different conditions, occupational therapy involving traditional techniques, and occupational therapy involving multiple animals including llamas, dogs and rabbits. Language use and social interactions with people or animals were assessed using standard behavioural rating forms. During the sessions involving animals, participants demonstrated better language use and social skills than when the animals were absent. The authors concluded that the presence of animals in therapy allowed children to exercise their language and social skills with nonjudgmental others.

A common thread among the studies reviewed above is that all of them targeted social skills and language. However, we do not know how children with ASD would respond to animals familiar to them, or how they would respond to animals in familiar settings, such as their home. It is clear, however, that children with ASD respond positively to live animals in a therapeutic setting, and in some cases, the responses of this

population was similar to neurotypical children (e.g., recognition of drawings representing animals).

Burrows, Adams and Spiers (2008) undertook a different approach to the study of effects of animals in the lives of children with ASD. They used qualitative methods to investigate the role of service dogs in the homes of families of children with ASD.

Service dogs for autism are dogs specially trained for various tasks, the primary task being to resist children's bolting behaviour. These dogs are different from typical guide dogs because they work in a triadic relationship- when in service, the dogs are tethered to the children with ASD, but they take instructions from the children's caregivers.

The research goal of Burrows and her colleagues was to identify and describe patterns of behaviours between service dogs, children, and family members. The authors used a combination of interviews with parents, field notes, and video-recorded observations, based on a method developed by Morse and Bottorf (1990). Burrows and colleagues followed 10 newly trained service dogs for a period of six to 12 months after placement in their respective families. Each dog was placed in a family with a child with ASD between the ages of 4.5 and 14 years. Information related to the symptom severity of participants was not provided.

The researchers reported that the presence of a service dog in these families was associated with several important benefits for both children and their parents. First, the benefits for children were that certain problematic behaviours or developmental delays improved (e.g., walking ability, improvements in motor function, decreased anger and anxiety, decreased frequency of tantrums). Second, the dogs provided the parents with an improved sense of security by preventing child wandering and bolting. Third, presence

of the autism service dogs reduced the reported anxiety and stress of parents of children with autism in public settings by making the disorder visible to the public. Fourth, because the parents were working with the dog, they developed a bond with the dog. This bond provided the parents with social support in the form of emotional support and companionship.

However, a couple of negative findings were also reported. First, two service dogs were returned. In first case the dog was returned due to an incident in which the dog dragged the tethered child while the dog took off after another dog- this dog was retired from service and was adopted by the initial puppy raiser. In second case the dog was returned due to chewing problems and due to being much more energetic than the child. This dog was later placed with other family where the energy level of the child matched dog's energy level. These incidents negatively affected parental well-being, given the emotional and financial effort expended in acquiring the dogs, and was detrimental to the child as well, by adapting to the dog, only to have the dog disappear. Despite the fact that the service dogs required additional time and financial investment from parents of children with ASD, most parents felt that they benefited from the presence of a service dog in their family.

The studies reviewed so far investigated the perception of children with ASD towards animals, the role of animals in therapeutic interventions, and the role of service dogs. Only one study to date has investigated the role of companion dogs in families of children with ASD. This study is important to the present project because it provides information about the long-term effect of companion dogs on children with ASD, and it also provides information about the role of companion dogs for parents.

In my honours thesis, Colțea (2008) explored the role of companion dogs in families with children with ASD. Questionnaires were administered to parents in 12 families of children with ASD. The questionnaires assessed parental stress and life satisfaction, child disorder severity, language and social skills, and attachment to the companion dogs for both parents and children. A new questionnaire was designed especially for this study in order to measure the reciprocity of the bond between children and their companion dogs.

Of the 12 participant families, nine had a companion dog. The age of children in the sample ranged from three to 13 years. The symptom severity of children was assessed using a Yes or No version of the Autism Behavior Checklist Questionnaire (ABC, Krug, Arick & Almond, 1980). The mean ABC score for the sample ($M = 77.73$, $SD = 24.23$) was above the clinical cutoff for Autism (i.e., scores above 68 indicates autism, while scores below indicate other PDD disorders (Krug, Arick & Almond, 1980). The design allowed for both group comparisons and correlational analyses. Using a split-half procedure, two groups of parents were formed based on the extent of their attachment for the companion dog.

The findings confirmed that children with ASD were responsive to their companion dogs, suggesting that the dogs act as a social stimulus, and that the children with ASD were able to form strong attachments to their dogs. Stronger attachments were associated with older age, better verbal ability, frequent interactions with the dog, and stronger dog attachment to the child. Unexpectedly, lower attachments to the companion dog were associated with better social ability, and lower autism symptom severity. It was speculated that ASD children with better social ability or higher IQ's may find adequate

social support in human relationships (caregivers, siblings, friends), and thus are less motivated to turn to a dog for companionship. Alternatively, analysis of parental reports suggested that almost all of the child-dog interactions took place in the home. With one exception, where the child was accompanied by the companion dog and parents to school and in other activities, the children with ASD did not engage in outdoor activities with their companion dogs. Mader, Hart and Bergin (1989) found that service dogs facilitated social interactions for wheelchair bound children. Companion dogs might facilitate social interactions for children with ASD if the child-dog interactions would occur outside the home (i.e., where more interactions with other people would be possible).

Mothers of the more severely affected children reported experiencing greater stress, which was not surprising as it is known that parental stress is influenced by child's symptom severity (Heiman, 2002). They were also more likely to be more strongly attached to their companion dogs, as suggested by their higher scores on CDIQ. However, their attachment to the dog did not reduce their stress nor did it increase their life satisfaction. In fact, stronger parental attachment to the dog was actually associated with less satisfaction in emotional and home domains. Possibly the dogs provided a form of social support for parents, but the relationship was insufficient to impact stress of this magnitude. These results might have been influenced by differences in the family status. Single mothers were observed to be more attached to their dog, yet were less satisfied than other mothers in five domains: overall, social, home, emotional, and parenting. Possibly the companion dogs provides social support to parents lacking human social supports, but the support gained is not sufficient to ameliorate the extreme stress these women were experiencing.

While the findings from this study were limited by the small number of participants, it was confirmed that children with ASD are responsive to their companion dogs, and form emotional attachments to them. The bond with their companion dogs can influence language, if not social development. This study did not clarify how the bond between children and dogs develops, and it did not prove conclusively that companion dogs can provide a viable source of social support to the parents. However, the findings are important because they imply that families of children with ASD benefit from the presence of companion dogs already residing in their homes.

In summary, ASD is a pervasive developmental disorder that adversely affects many Canadian children and their families. Common characteristics include impairments in social interactions and communication (DSM-IV-TR, 2000). The few studies investigating the effects of animals on children with ASD have focused mostly on the short-term effects of animals in therapeutic settings, especially dogs. Based on the present literature, children with ASD are responsive to the presence of dogs in therapeutic settings, and children's social interactions and language use improved when dogs were used. It is important to note that due to the considerable behavioural and cognitive differences between individual children with ASD, improvements in social interactions and language could vary (i.e., some children may benefit in one specific area but not in other).

Relatively little is known about the influence of companion dogs on children with ASD, or about the effects of companion dogs on their families of children with ASD. The limited literature that exists suggests that dogs can provide an important source of social support in these families, a source that has not yet been studied in detail. Much

remains unknown, including the developmental trajectory of the relationship between children with ASD and their companion dogs, as well as what influences this relationship (e.g., parental influence, biological factors, characteristics of companion dogs, etc). Further, it is unknown what factors can strengthen the relationship between companion dogs and families of children with ASD. Knowing more about these factors could contribute to an improved well-being for these children.

With the exception of Burrows and colleagues (2008) and Colțea (2008), no other studies were found that investigated the complex relationships between dogs, children with ASD, and their families. To date, no qualitative studies have investigated these relationships in families with children with and without children with ASD.

Present Study

Based on the preceding literature review, there is some research evidence that the presence of companion dogs can potentially provide social support, companionship, developmental benefits and better health outcomes to both children and adults in typically developing populations. Although the literature is much smaller when it comes to families of children with ASD, there is also some support indicating that some of these observations may apply to these families.

A qualitative approach was deemed suitable because of the scarcity of research in this area and because of the potentially high number of variables that need to be considered. Qualitative research is useful in generating new ideas and theories based on the perspective of participants. Moreover, it allows the participants to present their perspective without being constrained by researcher biases (Glaser & Strauss, 1967).

The objective of the present research was to investigate the effects of companion dogs in families with and without children with ASD, using the Grounded Theory method (Glaser & Strauss, 1967). Specifically, I wanted to develop a framework that might explain the potentially beneficial effects of companion dogs, as well as identifying the factors that contribute to these effects. Based on the guidelines of Grounded Theory, which is mostly inductive, no hypotheses were developed before conducting the study. More details about the study sample and methodology will be provided in the following section.

Method

Research Method

Glaser and Strauss (1967) developed the Grounded Theory as an inductive method, based on a rigorous and systematic process of data collection and analysis, and is ideal for creating new theories. As Willig (2001) explained,

First, Grounded Theory is designed to facilitate the process of ‘discovery’, or theory generation and therefore embodies one of the key concerns of qualitative methodology. Second, Grounded Theory works with categories, which makes it more accessible to those trained in quantitative methods than are method(ologie)s that problematize categorization itself (e.g. discursive approaches). (p. 32)

One issue that surfaces when talking about the credibility of any research is whether the method used to analyze the data was appropriate. The very limited research on the topic of companion dogs in families of children with ASD suggested that there are many unanswered questions and probably many unknown issues. The present research project demanded a flexible research method, one that was able to respond to the issues

named by participants. This project also demanded a fresh perspective, a perspective based on participants' understanding of their reality. In addition, using a qualitative method that accounts for participants' perspectives avoids imposing researcher's view, and thus provides a good base for future projects.

Charmaz (1995, p. 48) stated that "By offering a set of systematic procedures, Grounded Theory enables qualitative researchers to generate ideas that may later be verified through traditional logico-deductive methods." Nonetheless, as Glaser and Strauss (1967) originally claimed, Grounded Theory qualitative work stands on its own because it explains basic processes in the data and it makes sense of human behaviour.

The method of Grounded Theory expects the researcher to become "immersed" in data (Maxwell, 1992) and, based on this deeper understanding, to develop a theory of the area of interest. Because the research involves the subjective views of the researchers and the participants, the theories produced by different researchers on the same topic are likely to be different (Morrow, 2005). This perspective is consistent with the *social constructivist* approach. Social constructivism is a philosophical perspective in which reality is viewed as socially constructed, one in which there is no right or wrong perspective and no absolute truth (Newman & Benz, 1998). Rather than seeking agreement among researchers as a way of ensuring the quality of research, Seale (1999) suggested that, for qualitative research, it is more important to document the systematic process that was used to analyze the data. This documentation will ensure that other researchers can understand the analyzing process.

A social constructivist approach was used in the present project. The social constructionist perspective assumes that the researcher and the participants are

collaboratively constructing an understanding of a specific construct or process (Charmaz, 1990). More specifically, the resulting theory is based on participants' understandings of their reality coupled with researcher's theoretical explanation.

In conclusion, the Grounded Theory method was selected because it is best suited to underdeveloped research topics, and because it uses systematic and rigorous methods suited to analyzing numerous variables.

Researcher's Perspective

Being aware of one's perspectives and biases is an important way to minimize researcher bias. Three aspects influenced this project: my research position, my previous research on this topic, and my work experience.

My stance as a researcher and as a person leans heavily towards the principles of social constructivism. I was formally introduced to qualitative research during a graduate-level course in qualitative research methods. The experience of conducting a research project for that course, using the Grounded Theory method, combined with the numerous course readings and the interesting in-class discussions lead to using the same methodology for this project.

A second factor that influenced me as I conducted the present research was my previous research experience in two projects involving children with ASD and companion animals. These two studies investigated the role of companion dogs as social support for children with ASD and their parents. Based in part on the results of these studies, I envisioned the results of the present research project showing that companion dogs are considered as family members, and that the dogs contribute to the socio-

emotional support of parents and children. I also expected that the dogs' presence would be explained by the benefits they provide to the family members.

A third aspect that influenced me as I conducted this research was my experience as dog trainer and worker with children with ASD. In the past, I worked on improving social communication with shy children based on dog obedience exercises. In 2009, I started working with one of my dogs on improving social skills for children with ASD, and recently I started dog communication classes for typically developing children and children with ASD. Based on these experiences, I expected that parents and children who were more knowledgeable of dog behaviour, as well as people having dogs without behavioural problems, would perceive more benefits than people who have dogs who are not responsive to instructions, or people with little knowledge of dog behaviour.

These expectations, which reflect my own personal biases, were minimized in the present project by keeping a reflexive journal and by using post-interview forms. A reflexive journal was kept to record my position in relation to the research topic (e.g., Use open ended questions about how they interact with their dogs, avoid following up only if they interact more). Schwandt (1997) suggested that reflexivity is not only a process of self-reflection on one's own biases, it also implies that the researcher is part of the topic being investigated. For example, J.C. mentioned in relation to her children that "Yeah, I can't see any rewards yet, and I can't use the remote collar on them. It would be much easier if I could." Although the mention about children was a joke, I disagreed with the use of electric shock dog collars on dogs. This disagreement led to investigating in subsequent interviews where participants' knowledge about dog training comes from, and

whether there is a connection between dog training methods and interactions between dogs and family members.

Another way to minimize my biases was using post-interview forms (see Appendix C), immediately after each interview (i.e., usually in the car, after finishing the interview). They provided a trail about my emotional state during the interview (e.g., “I was a bit nervous”), about my interviewing style (e.g., “I used a leading question”), about participant’s emotional state (e.g., “She smiled a lot”), and about the changes occurring to participants as the interview was developing (e.g., “she seemed surprised, and a bit embarrassed to realize that she doesn’t have a picture of her husband on her cell phone, just pictures of the dog and her child”).

Morrow (2005) suggested that context is as important for understanding the participants’ perspective, as are the internal and interpersonal relationships. Therefore, notes were taken of the environment in which the interviews took place (e.g., “The house was well kept, but with signs of wear and tear from dogs”; “The interview was done on the back balcony, with the child with ASD playing in the garden, and the dog napping on a chair beside me”). Moreover, notes were taken of how the interview was affected by the environment - in one case the participant was afraid that the ambient noise was too loud (e.g., “coffee shops are good for my recorder, but the ambient noise made the participant feel uncomfortable. I think that she was afraid that her input might be wasted”).

In summary, I tried to become aware of at least some of my biases and expectations by using the reflexive journal and post-interview notes concerning the participants, the immediate environment, and myself.

Participants

Participants were recruited using online advertisements, paper flyers handed out in various places (i.e., Ottawa Humane Society Walkathon, various local dog parks and pet stores) that allowed me to advertise the study, and personal contacts. The online ads were placed on a local online discussion group for families with children with ASD, *OttawaAutismSupport*, and a local community organization involved with children with ASD, *Children at Risk*, sent out the add electronically to their members. The same ad has been used in all instances. The ad targeted families with children with ASD and without, who have had one or more companion dogs in their home for more than one year. Personal contacts were also used during the purposive sampling- one family where one parent is a dog trainer and breeder, and another participant family was recruited due to the potential input from the child with ASD (I met the latter family during one of my dog communication courses for children with ASD). These two families were contacted by electronically sending them the recruiting ad, without any other information.

In the ads, potential participants were asked to contact me electronically or by phone if they were interested to participate. Only one participant family contacted me by phone, the other 19 participant families contacted me by email. The reply received from most participants included a short description of their family- how many children, if any of them has an ASD disorder, how many dogs, and in some cases their age.

None of the participants was removed from the study; everyone who expressed an interest in participating was accommodated. Although some of the participants were not required due to reaching theoretical saturation, my decision to include them in the study

was based on providing them with the opportunity to talk about their experiences given their expressed desire to do so.

A standard message was sent to each participant, describing the study in more detail, and included the Informed Consent form. I explained that the project involves an audio-recorded interview with one or both parents that is approximately one hour in length in which they will be asked to describe their own and their children's relationships with the companion dog, and that their child(ren) presence is not required, but is welcomed if they wish to be present. If the child(ren) were present during the interviews, they were briefed about the research project, and the parents asked them if they wanted to participate. They were reminded that they are entitled to decline participating at any time, even after accepting to participate.

Overall, 27 dogs lived in the 20 households (see Table 1 for dogs' number, age, gender, breed, and individual traits).

Inset Table 1 about here

Twenty interviews were conducted mostly with mothers. In four instances both parents were interviewed and in nine instances the parents together with at least one of their children were interviewed. The families were selected to be as diverse as possible. Two separate interviews were conducted with the divorced parents of the same child. One family had one child with ASD, 13 families had both a child with ASD and typically developing children, and six families had only typically developing children (see Table 2).

Inset Table 2 about here

The parents' background characteristics were selected to be as diverse as possible. The selection of participants ensured that variability was met with regard to education, socioeconomic status, knowledge of dog behaviour, number of children, age and gender of children, as well as number, size, breed, age, and gender of dogs. The participants ranged in age from one year to 80 years old. From a cultural perspective, there were no differences among the participants. Parents' education was reflective of the area where the recruitment has been done, ranging from high school to post graduate degrees (see Table 3).

Inset Table 3 about here

Data Collection

After agreeing to participate, a mutually convenient date and place was agreed upon with the participants. The interviews were conducted individually in a single session, with the participants choosing the location of the interviews. Two of the participants chose coffee shops, one chose to meet at Carleton University, and the remaining chose their own homes. In the nine interviews when one or more of participants' children were present (i.e., the children were present, mostly, during the interview section about their interactions with their companion dogs), the parents informed the children prior to my arrival about the research project. The children were

free to participate if they wanted to, but they were not forced to answer if they chose not to. Further, the parents were not asked any potentially embarrassing questions for their children in children's presence.

The interviews lasted on average 90 minutes (i.e., shortest interview lasted 54 minutes, longest interview lasted 157 minutes). It was expected that the interviews would vary in length, due to differences in participants' relationships with their companion animals. In addition, some participants spoke freely and at length, while in Beth's case, a multitude of questions and approaches to same topics were used due to very short answers.

The interviews began with asking the participants to read the *Informed Consent* form, which described the research project and the procedures that ensured the confidentiality and anonymity of the data collected (the form was also sent by email previous to the meeting). A verbal overview of this form was then provided by the researcher, highlighting the voluntary participation and that the participants have the right to terminate the interview at any time. Signed consent was obtained for participating in the interview, for allowing the interview to be audio-recorded, and for having participants' names added to a database for future studies. None of the participants declined to participate in the study or to have the interviews audio-recorded, but some declined to have their name entered in the database for future studies.

After reviewing the consent forms, the participants completed a background questionnaire. This included general questions regarding demographics, the child(ren), and the companion dog(s) (see Appendix A). The background questionnaire was

completed prior the interviews in order to facilitate the development of a rapport before the interviews.

Most participants requested a summary of the final results, and only few of them chose pseudonyms by providing fictitious names (e.g., Cujo, Marvin). The researcher provided pseudonyms to the others by using diverse combinations of two letters (e.g., J.C.). In addition, all dogs were provided with the same pseudonym (i.e., Fido). All respondents were debriefed at the end of the interview session, both verbally and in writing. In addition to the information provided in the written Debrief (i.e., additional information about the study, and contact information in case they experience any distress because of their participation in the interview), at the end of the interviews I usually answered questions about myself, about my dogs, and about the reasons for doing this research.

Immediately after each interview I completed post-interview forms, recording contextual aspects, my impressions about the interview, and specific details that caught my attention (i.e., usually in the car). For example, after an initial warm-up period, most participants became very engaged and openly talked about their experiences. For example, C.M. mentioned a past abusive relationship, and how this affected her middle daughter: “there was a lot of like abuse in the home and she had a lot of hard time with attachment”. Similarly, Victor talked about the difficulties of a past divorce “It was hard for her, it wasn’t a nice breakup, and she would try us to hold hands, it was hard. She was sad, she was sad to have all this to happen.” Due to not being relevant to the present research topic, I did not pursue these topics further.

The post-interview notes also revealed how the dynamics of the interviews sometimes changed across the duration of the interview. For example, when interviewing both parents, the husband initially said that “he’ll be around if needed, but otherwise he’d be online and watching TV”. As the interview progressed, “he seemed to be more interested- he was passing by without any apparent reason, intervening in the discussion”.

My post-interview notes covered the canine participants as well, for those cases where I was able to observe the dogs. For example: “The dog was with us the whole duration of the interview. She didn’t seem too responsive to instructions, seemed to have a mind of her own”, and “the dog was constantly moving, trying to play with us, sniffing, constantly moving”.

The data were transcribed and subsequently analyzed following each interview. This was important because doing so provided direction for subsequent interviews and the emerging theory, as Charmaz (1995) mentioned “By simultaneously becoming involved in data collection and analysis, you will avoid the pitfall of amassing volumes of general, unfocused data that both overwhelm you and do not lead to anything new” (p. 32). The researcher transcribed the interviews in an effort to preserve the accuracy of the verbal recordings. In addition, transcribing the interviews helped the researcher become more familiar with the data. Although it is not customary, I would like to note that transcribing interviews was a slow and tedious process.

Interview guides were used for each interview (see Appendix B for first interview guide). The first two interviews were analyzed together, and were based on open-ended questions meant to provide a preliminary perspective of the research topic (e.g., *How would you characterize the relationship between your child and the dog?*). Subsequent

interview guides evolved based on the analysis of the preceding data. For example, the first guide contained approximately 20 questions while the last interview guide contained approximately 80 questions- not including the questions that cropped up during the interview, denoting the expanse of the categories of interest. Further, this practice was based on the need to investigate diverse topics introduced by participants (May, 1991). Of note is that, although an interview guide was used, the interviews followed the lead of the participant.

As is customary in Grounded Theory research, the interviews were fluid and used variations of the same questions based on where the discussion was lead by the participant. For example, while trying to understand the type and amount of interactions between children and their companion dogs I used different questions based on the information already provided by participants, and based on whether the conversation was with a parent or a child. With young children, efforts were made to obtain information directly from them about their interactions with their dogs, even if it meant using somewhat leading questions. The following excerpt is from a discussion with a 3 year old girl and her parents:

Interviewer: E., what do you do in the morning?

Child: I go to say good morning to my dog.

Interviewer: And then what do you do, do you go to school?

Child: Yes.

Mother: Then you come home, and what do you do?

Child: I watch a bit of TV.

Interviewer: Do you see Fido when you come home?

Child: Yes.

Interviewer: And what does he do?

Child: He jumps.

Interviewer: And what do you do?

Child: I say stop.

Father: You laugh?

Child: Yes.

In order to ensure that the data was grounded in the participants' experiences, I tried to avoid using leading questions (e.g., Do you think that this is better than ...). I also avoided using closed Yes or No questions (e.g., Is it true or not that...) to allow the participants the necessary freedom for expressing their thoughts. Moreover, I asked for examples to ensure that I have a clear understanding of their perspective, and to reduce the effects of my biases when interpreting the data later. For example, while trying to understand I.B.'s comment about her dog having anxiety, I asked if she could provide an example:

Interviewer: Could you give me an example of this?

I.B.: If we go away and she's with someone else she will often not eat, she's always had separation anxiety, like if you were to get up and start laughing she would probably bark at you. Any kind of emotion she barks.

Further, during the interviews, I often probed participants' statements in order to clarify what they meant (e.g., "What do you mean when you say that he took on you?").

Following the interviews with the first two participants, face-to-face, semi-structured interviews using more detailed questions were conducted with the other participants.

Maxwell (1992) suggested that prior to analyzing the data, researchers have to familiarize with them. This process was possible by conducting and transcribing the interviews, as well as by re-reading the interviews several times prior to analyzing them.

Data Analyses

The data were analyzed according to the guidelines of Glaser and Strauss (1967), Straus and Corbin (1998), and Charmaz (1990, 1995). The data analyses were facilitated by the use of software, NVivo versions 8 and 9. Data analyses involved three stages of coding: open, axial, and selective. Coding “is the process of defining what data are all about” (Charmaz, 1995, p37). Coding is both the simplest and yet the most important part of Grounded Theory methodology, because the future categories are based on this interpretation (Willig, 2001).

The first stage, open coding, involved identifying meaning units (i.e., phrases or lines expressing a certain concept relevant to the present project), and assigning them codes (i.e., labels summarizing the meaning units). *In vivo* codes derived from the participants’ own words or word combinations were used whenever possible (e.g., dog as baby). *In vivo* codes served a twofold purpose. First, they ensured that the analysis was grounded in the data, therefore reflecting participants’ narratives (Straus & Corbin, 1998). Second, the *in vivo* codes provided another level of protection against researcher’s biases, by providing a fresh, data-based perspective (Charmaz, 1990).

During the second phase of coding, axial coding, constant comparisons of the codes and questioning of the data lead to the development of more conceptual categories (Charmaz, 1990). The comparison between different codes, concepts and interviews, based on the differences and similarities present between them, is referred to as the Constant Comparative Method of analysis (Glaser & Strauss, 1967). This comparison is present during the entire analytic process, and is the process that leads to more refined analytic precision.

Concepts or categories are more abstract codes, part of an emerging theoretical framework in which the categories interact, relate, and predict each other (e.g., Dog Characteristics). In this second stage, although still grounded in the participants' perspective, the codes have a higher level of abstraction, in part because of researcher's contribution to interpreting the data. I played an important role in questioning the data and identifying the concepts, actively constructing a reality with the participants.

During this stage, I was interested in knowing more about the conditions that led to some categories (e.g., What characteristics of children with ASD are important?), about the interactions between certain categories (e.g., How is dog training related to expectations), and how the respective categories differed or clustered together (e.g., Is parent knowledge of dogs related to children's knowledge of dogs?). Moreover, not only were the relations between categories refined, new questions were raised during this process (Neuman, 2000). For example, new properties were added to *child characteristics*, and the *effects of dogs on children* was divided based on whether the children had a diagnosis of ASD.

The third stage of coding, selective coding, involves integrating all categories and obtaining one category that is related and explains the relationships between the other categories. A clearer understanding of the effects of companion dogs on families with children with and without ASD, and how these effects occur, began to form during the second stage of coding. However, it was not until the third coding stage that I identified the core category, *match*. This core category had the highest level of abstraction, and was related to all of the other categories.

Another aspect of the analysis involved looking for negative cases, which are cases that contradict the apparent relationship between categories. These cases are essential in ensuring that the data are investigated thoroughly, and identifying such cases helps avoiding an overly simplistic explanation of the topic of interest. Further, these cases strengthen the emerging theory by searching for further explanations for them (Seale, 1999). As further described in the results section, two negative cases were identified. Initially, Lynn's case seemed to contradict the core category, *match*. However, it became evident that knowledge of dog behaviour influenced parents' expectations of their dogs. For Lynn, the lack of knowledge regarding dog behaviour lead to unrealistic expectations of her dog, and in turn, this resulted in her ambivalent position toward the dog. The second negative case involved the relationship between S.J. and her husband and their companion dog. Although their expectations of the dog were met, other factors were found to influence their relationship with their dog; namely their comparisons of the present dog with their previous dogs prior to having the children. In this case, S.J. and her husband had pure bred dogs with which they participated in numerous activities before having the children. The present dog was a family dog who

although a good match for the children, was not the parents' dog. Accounting for these negative cases strengthened the developing theory by increasing its scope.

Although the coding process looks linear because the codes became increasingly abstract, the analysis actually fluctuated back and forth between the various stages of coding. During the second phase, axial coding, the analysis oscillated between the categories, and compared them with new interviews. Following the Grounded Theory methodology, the first two interviews were analyzed prior conducting the other interviews (Strauss & Corbin, 1998). This ensured that the categories obtained were data driven and that the following theoretical sampling was based on participants' reports.

Based on the analysis of the first two interviews, several initial categories emerged (e.g., dog as baby). The categories obtained after analyzing the first two interviews, together with the need for theoretical saturation, influenced subsequent recruitment. For example, after the first two interviews it appeared that the age of dogs was a factor in how they interacted with the parents and their children. Consequently, an effort was made to recruit participants with dogs who varied in age in order to further explore the observed effect.

Subsequent analyzing each interview, new categories based on the emerging theoretical concepts were added. For example, initially I asked the parents "How has having the dog affected you?" Based on the preceding interviews, new categories were identified, and consequently new questions investigating these categories were developed (e.g., "Does your dog cuddle with you?"; "Does it make a difference to have the dog around when alone?"; "Was your interaction with the dog similar before having the children?"). With each interview, I tried to get a deeper understanding of the concepts of

interest, and thus I used more specific questions and probes while avoiding leading questions.

This iterative procedure continued until no new information emerged, suggesting that theoretical saturation was achieved. Strauss and Corbin (1998) noted that theoretical saturation is a matter of degree because, in practice, it is always possible to find new information. In this project, theoretical saturation was achieved after the fourteenth interview, because there was sufficient variability within each category and the relations between the categories were clearly established. Nonetheless, interviewing continued with the additional six families who wanted to participate in this project. These last six interviews provided additional support to the emergent model, and provided more variability within categories.

While looking for theoretical saturation, the participants were purposefully recruited to meet the need for fulfilling the variability necessary in each category. For example, personal acquaintances were contacted in order to satisfy the need for variability for *Dog Knowledge*, a category deemed relevant to the developing theory after analyzing J.C.'s interview.

During the data analysis, I kept memos regarding my thoughts and hunches related to the analysis of data. Memos are a way to reflect on the relations between categories, on the emerging concepts, and on how everything fit in the emerging theoretical framework (Glaser & Strauss, 1967). These rough memos formed the foundation for the theoretical framework by making the connections between data and categories and among categories.

Glaser and Strauss (1967) concluded that good research is not based on consensus on specific data, but good research has to be credible. A consideration of how research quality applies to the present study will be presented next.

Research Quality

One of the first questions that comes up when talking about the credibility of any research, is whether the method used to analyze the data was appropriate, and whether the research method was used properly. The quality of the Grounded Theory methodology is ensured by respecting several criteria: credibility, transferability, dependability, and confirmability.

Credibility. Credibility is similar to the concept of internal validity, and refers to ensuring the accuracy of the results. Several methods were used in the present study to achieve this (i.e., accuracy of data, data analysis and interpretation, theoretical sampling, iterative analysis, testing emerging theory with new data, providing enough participant quotes, providing contextual information, and delineating data from the researcher's interpretation).

I digitally recorded the interviews and transcribed them to ensure the accuracy of the data. Staying true to the participants' perspectives was also facilitated by using *in vivo* codes during the first stage of open coding. After the first two interviews, when the first codes (e.g., "dogs as glue") and categories (e.g., "dogs characteristics") emerged, I relied on theoretical sampling and the constant comparison method to ensure that I stay grounded in the data. The theoretical sampling was based on analyzing the emerging categories while searching for new, alternative, explanations for the relations between them, as well as on ensuring the variability of data in each relevant category to achieve

theoretical saturation. In addition to searching for relationships between categories, the theoretical framework was compared with the new data provided by the last six participants.

Charmaz (1995) suggested that credibility is enhanced when researchers provide enough participant quotes to clearly reflect the voice of the participants. Quotes were selected carefully in order to represent all participants. Further, the number of quotes included in this document is reflective of the importance of the concept being presented. Rubin and Rubin (1995) suggested that two to three quotes should be used to highlight major concepts, and one to two quotes for minor concepts. The Results section will reveal that the quotes are taken equally from all participants, and that the number of quotes are related to the salience of the points being made.

Seale (1999) concluded that the credibility of any qualitative research is enhanced by providing information about the social context of the findings. This practice was engaged in the present research project. Participants' view that dogs are part of their family was checked against their previous experience growing up, if they had dogs, or was checked against cultural norms from when they were growing up. Thus, an effort was made to understand their current view of their companion dogs in a larger context.

In addition, *bracketing* (Peshkin, 1988) contributed to the credibility of the findings. Although I co-constructed a theory with the participants, it was important to ensure that my readers can clearly delineate whose perceptions are presented. In the Results section, my assumptions are clearly highlighted by using words that signal my involvement (e.g., *inferred*). In contrast, participants' quotes are identified as such.

In summary, I used a number of procedures to ensure a rich description of how companion dogs function in families of children with and without ASD, while at the same time providing the necessary context in order to understand these processes.

Transferability. Transferability is similar to external validity in quantitative research. This was ensured by providing clear details on how the participants were selected and by clearly describing participants' characteristics. A detailed description of participants' background information was also presented (see Tables 1, 2, and 3). This information should allow readers to determine who the findings are likely to apply to.

Dependability. Dependability is similar to reliability in quantitative research. A methodological journal and memos were kept during this research in order to maintain a record of how the data was collected and analyzed (Strauss & Corbin, 1998).

The journal was used to record changes related to sampling, to the interview guide, as well as the development of the theoretical framework in order to provide the means for evaluating or replicating this study. The following is an excerpt from my methodological journal "Dogs seemed to have provided emotional support to single mothers in my previous study. Perhaps a general question about emotional support should be in the interview guide" (February 18, 2010). Also, at the suggestion of the members of my committee, "Instead of asking the background questions, I will include them in a questionnaire to be completed before the interviews" (May 25, 2010).

The memos were thoughts related to coding and to analyzing the data. They were based on the analysis of the data, and were essential in developing the future theory by providing a trail for where the categories originally emerged and how they developed

during the ongoing analysis. The following is an example of a memo from September 19, 2010:

Parents report different behaviour from dogs based on whether inside or outside.

Dogs well trained behave similarly, whereas dogs with behavioural issues do not provide same level of benefits to guardians as if they are inside. Big difference

based on whether inside or outside. Interestingly, guardians do not seem to notice these aspects, and do not seem to be bothered by these aspects.

Following this memo, in subsequent interviews, I explored the difference in the inside and outside behaviour of dogs, as well as people's knowledge about dogs.

Confirmability. Confirmability was made possible by using a reflexive journal (Seale, 1999). As previously mentioned, the reflexive journal was used to make me aware of my biases and thereby minimize their influence during the data collection and analysis. For example, I expected that men would interact the most with their companion dogs, due to my previous experience as a dog trainer. In order to avoid imposing my expectation on the participants, during the interviews I used open-ended questions (e.g., "Do you interact with your dog?").

Taken together, the various documents, including the methodological and the reflexive journal, the post-interview forms and the memos collectively provide an audit trail for anyone who might wish to know more about the data analysis or want to recreate the analytic approach used here.

Results

The objective of the present research was to investigate the general effects of companion dogs in families with and without children with ASD, as well as to investigate

the factors leading to these effects. The analyses of the interviews suggested that companion dogs are regarded as family members, and that the *match* between the *characteristics of the companion dogs* and the *characteristics of their human companions* influenced the effects of dogs on their companions and the family as a whole. The match was defined by the overlap between the characteristics of the dogs and those of humans, with a better associated with more beneficial effects for people. However, the effects of companion dogs varied for each individual family members. Hence a good relationship between a parent and a dog did not necessarily generalize to the dog having beneficial effects for the child. Nevertheless, companion dogs did influence the whole family, for example by acting as “glue” bringing family members together.

When there was a good match, dogs provided children with and without ASD with direct and indirect social support³, physical benefits, and the opportunity to learn about responsibility. When there was a good match, the children with ASD experienced additional benefits in that they related more readily to their companion dogs than to people, learned about social concepts by observing their dogs and, in some cases, had their sole friendship with their dog. Further, the match also influenced the emotional attachment of children to their dogs.

For parents, the presence of dogs was related to physical benefits, as well as direct and indirect social support, depending on the quality of the match. Additionally, the dogs provided couples, especially future parents of a child with ASD, with parenting skills. However, parents experienced several negative effects as a result of their dogs, such as financial burdens, disruptions in family schedules, burdens when having a child, and

³ As previously mentioned, direct support is support directly provided by the dog (e.g., companionship, emotional support), while indirect social support is provided by the dog by mediating social interactions (McNicholas & Collis, 2006)

added stress when the dogs misbehaved. However, such negative effects were minimized and ignored when there was a good *match* between one or both parents and the dog, or a good *match* between one or more children and the dog, especially for children with ASD.

The benefits experienced by parents were moderated by their *expectations*. Parents who had or developed realistic expectations of their companion dogs registered more benefits. Parents' expectations, in turn, were affected by their previous or acquired *knowledge of dog behaviour*. Parents who had a better understanding of dog behaviour had more realistic expectations of their dog and, as a result, registered more benefits from the dog's presence.

Dogs' training moderated *In or Out* (i.e., the location where participants experienced the most benefits, inside or outside the home). For most participants, the companion dogs provided more benefits inside the home where they were better behaved. Another category that moderated parents' benefits was related to *family stages* (i.e., singles, couples, with or without younger children). Parents experienced more benefits from their dogs' before the children were born, and when their children are older (see Figure 1 for the overall model). The reported bond between participants and companion dogs was based on the *match* between them. For some participants this bond was instantaneous, for some it developed over time, while for some it never developed.

Insert Figure 1 here

In summary, the effects of dogs on families with and without children with ASD were influenced by the *match* between the *characteristics of the companion dogs* (i.e.,

age, breed, training, individual characteristics), the *characteristics of the children* (i.e., age, gender, individual characteristics, social circle) and the *characteristics of parents* (i.e., individual characteristics, gender, and dog-related family conflicts). *Knowledge of dog behaviour, expectations, and family stages* moderated these effects. See Table 4 for a summary of the findings.

Characteristics of Companion Dogs. The companion dogs varied on several categories: *age, breeds, training, individual traits* (see Table 1). Before presenting the details on these characteristics, the following paragraphs will present how the participating families positioned the dog in the context of their family.

Dogs as family members. While children viewed the dogs as family members, the analyses of the present project suggested that parents defined dogs' position in the family as being on a continuum.

For children, the dogs were always considered family members, and in some cases equivalent to siblings, such as for K.K.'s single child: "She says he's her brother." Although P.Q.'s children did not overtly declare that they liked their dogs, they considered them as family members "they get quite adamant, that no, you don't get rid of them, they're part of the family."

For parents, A.D. thinks of her dog as "It's like another child", but this is in the context of responsibilities, not in an emotional way. For A.D. the dog is part of her family "I like it being a family that has a dog", but is on the outskirts, the dog does not match her family. In contrast, K.K. viewed her dog similar to other family members "he's just part of the family... I care for him, in the same ways that I do for my own children."

Other parents considered their dogs part of their family, but they differentiated between children and dogs. Victor mentioned about his companion dog that “She is definitely part of the family, she’s not human, but I wouldn’t consider her as a child. Dependant is a better word, but it’s not like she’s on the same spectrum as kids.” Similar to Victor, C.N. also made a distinction between children and dogs “I never felt that they are my kids... They are pets, are part of our family, but just like he is my son, they are dogs.” However, although there is a hierarchical position between family members and dogs, most parents referred to the dogs as people, similar to Moira “With the cat and the dog there’s four people.”

Overall, parents’ gender did not influence dogs’ treatment in the family. However, dogs’ position in the household was moderated by previous experiences in some cases. For example, C.N.’s husband grew up on a farm and according to the description of his wife, “he was raised on a farm and animals were sort of animals, they weren’t anything to sleep in your bed, that’s for sure.” That experience influenced his present view that dogs are somewhat disposable “I think he would consider them part of the family, but also part of the family that could be not there if it had to be.” This was in conflict with C.N.’s desire to include more the dogs in the family life “I would prefer them to be a little bit more part of the family.”

Dog age. This category became important after the second interview, when I.B. mentioned that her daughter is now at the age where she would like to interact with the dog, but the dog is too old and does not want to interact with the child. She noted that

“They don’t really play together, and now that my daughter’s playing, is not in the way that Fido⁴ really enjoys”.

The dogs varied in age from one and a half to 12 years old. I.B. referred to her dog, who was 12 years old, as being “almost like a furniture cause she sleeps most of the time”, a dog with very low needs “right now, at her age, basically needs to go out to use the bathroom, so, she’s not really, she’s just kind of around, she does sleep most of the day”. Moira also reported that her 10 year old dog “sleeps all day”. As expected, the activity level of the dogs was influenced by their age.

Dog breed. The *breed*, or genetic background of the dogs was also relevant to their level of activity. Participants’ dogs had a varied genotype. M.E. chose Poodles due to health concerns for herself, while acknowledging and accepting that these are hyperactive dogs: “We were limited to dogs that don’t shed, and I’ve had poodles before...The temperaments, they’re a little more agitated, they’re not the calmest dogs, we knew that.” Similarly, V.A.’s Schnauzer-Poodle cross was “Very, very hyper. He’s a very hyper dog, very. Barks a lot, like very busy and emotional kind of dog.” In contrast, J.C.’s dog, a Doberman, was calm and “very well behaved, yeah, very well behaved.”

Similar to age, the breed characteristics of the dogs influenced their behaviour, and their interactions with the family members.

Dog individuality. The dogs participating in this study varied in another category, *individual characteristics*. The variation existed between breeds, and within breeds. Victor reported that his dog is a people dog: “She’s like, serene, loves people.

⁴ Please note that in order to protect the identity of participants all dogs participating in this study were named Fido. For the instances where a citation includes more than one dog, numbers will be used to differentiate the dogs (e.g., Fido1, Fido2).

Grumpy with other dogs, but loves people.” Sophia reported that one of her dogs, who are all different breeds, is different with respect to dog interaction “Fido1 and Fido2 don’t get along with other dogs. Fido3 was always social.”

Differences within the same breeds were also found. P.Q. reported that her two dogs were quite the opposite “Fido1 is a dog, he knows he’s a dog, he’s a dog, and he’s protective of the house, that’s why he has to be locked when somebody else comes because he will growl; Fido2 is a princess, she’s a sack- if she was out, she would be on top of you.” Similarly, M.E concluded that her two Poodles have different personalities “Oh, they’re very different. The little one, the older one, is more hyper, more excitable, and very smart. The second we call him Stupider, but he’s very loveable, you can do anything to this second one.”

Another difference between dogs was observed with regard to how they interacted with the family members. For example, A.I. mentioned that when they went to see their future dog, they immediately liked the way he interacted with their daughters: “And he was interacting with them very well, he was very gentle, even as excited as he was, because he was in a crate all day.” In contrast, R.G.’s dog was more rambunctious in his interactions with the children “he’s always jumping, barking, trying to steal their food.”

Sophia described her dogs as always wanting to interact with her and other family members: “Just the way they want to sit near us, and come to us, and want to play with us, come with the ball in their mouth, a sock, they’re not supposed but they do ‘cause they want to play with you. They’re always wanting to interact.” In contrast, Victor would have preferred that the interactions between his daughter and their dog would be different. At the present, the dog does not react to instructions from Victor’s daughter

and he thinks that his daughter is missing this: “if she could just say Fido come... Fido would immediately come there, and she would have this security, this emotional connection.”

Another property in which the dogs varied greatly was their *training*, which was defined as perceived appropriate or inappropriate behaviours. The training of dogs varied from not existent to advanced training in certain dog sports. M.E. reported that her dogs are “probably not trained as well as they should be... they bark a little too much, they don’t listen as well.” In contrast, C.N.’s dogs had advanced training “Fido1 was supposed to be my training partner, I was going to pursue more competitive dog obedience with him, and dogs sports with Fido2”.

Characteristics of Children. Children’s *age, gender, individual characteristics*, and *social circle* were found to influence their relationships with their companion dogs.

Child age. Except one family, the participant parents had more than one child. The interviews covered the interactions between companion dog(s) and the children present in the home, even with teenagers and young adults. The age of children varied greatly, from one year old for J.C.’s and A.D.’s children, to 22 years old for one of M.E.’s children. The developmental age of children was found to be related to how the children interacted with the companion dogs.

Initially, the dogs were a source of amusement for babies, who noticed dogs’ movements and responded by giggling. For example, C.N. reported that her son enjoyed the dogs’ movement than the parents’ efforts to make him laugh:

he was 4 months old and he was just starting to laugh so we would try all sorts of goofy things to make him laugh and one of them that would consistently make

him laugh was that we would be walking with the dogs and they would run and he would laugh. So that's what got him laughing, was the dog movement and the dogs' motion rather than anything we were doing.

I.B. also said the dog was a source of amusement for her three year old daughter: "She's always seen her, and noticed her, and enjoyed the barking. She laughs when Fido barks".

After this initial stage of observing and enjoying the dogs, children's behaviour towards the dogs became exploratory in nature. Initially, the children, both with and without ASD, appeared not to know how to interact with the dogs. For example, "at first she was not sure what to do" said A.D. about her nine month old baby. During this exploratory stage sometimes the dogs had to be protected from the children. Marvin mentioned that his daughter went from being annoying to the dog to being a source of food for him "before she was a source of food for him, she was picking up at him and stuff, so he is being protected by us." C.N. also noted that her dogs were ambivalent toward her son. She recalled that "they don't consider him yet as anything but a source of food or a source of annoyance... they're [the dogs] running from him because he's at an age where he's rough so they don't know what to expect from him." It is likely that this ambivalent stage was due to children's limited communication skills, as C.N. mentioned about her two years old son "he's not coordinated enough to do hand signals and he's not verbal either so he has no clear communication with them." Similarly, Cujo and Marvin had a difficult time trying to stop their typically developing daughter from mistreating the dog:

I'd say not pushing Fido's back, not squishing and jumping on him, that took a long time, until last year [at age three]. She wasn't aware of the impact on other

people and other things. I'd say that took a lot from us, "you have to be gentle, you can't pull on the leash like that, you gonna hurt his back, or walk over him when he's in the bed." That repeated over and over.

The notion of babies as source of food was discovered by dogs; it was not that the children were providing the dogs with food. For example, A.D.'s dog understood that the baby was a source of food: "the baby swaps the food off the table, and the dog will be there". Similarly, I.B. described how her dog learned that the baby is a source of food

around one, or maybe earlier, with the exersaucer, it's baby as a source of food and treats and stuff, so she was in her face all the time, because at that age they always have sticky fingers, they have cheerios, so she was really interested in her.

Children's interaction with their companion dogs changed when they became better able to communicate. I.B. reported that, although her three year old daughter was always aware of the dog's presence, recently she seemed to be more interested in the dog:

She's always seen her, and noticed her, and enjoyed the barking, she laughs when Fido barks, but 2 months ago she was like "Look, it's a dog," "it has ears," because that's how she's starting to speak, pointing at features and functions, things like that. So it's just 2 months ago that she started to acknowledge her presence.

With age, children's interactions with dogs became more appropriate. However, children who did not grow up with dogs seem to undergo the same exploratory phase, when they initially acquire a dog, particularly children with ASD. For example, A.D.'s five year old son with ASD did not know how to interact with the dog when they first got him:

In the beginning, he was quite intrigued with this dog, it was the same when the cat came. But he has to do things to bug her. Put the fingers in the ear, see what the dog does. He did pull the tail initially, sort of, and used to make a song and just wag the tail, and of course the dog didn't like that very much. This went on for a while, and you could tell him until you're blue in the face to be nice to the dog. He never pet the dog, it was always these silly things, trying to do silly things.

Although parental input into how to properly interact with the dog was unsuccessful, the dog's input seemed to have been more effective for one five year old child with ASD. His mother reported:

And then one day I heard a very big bark noise, and I came out and he must've done something to irritate her enough that she scratched him. He was lying with her crying, on the dog bed [mother laughing]... After that he didn't really bug the dog anymore.

Animals also taught J.C.'s five year old child with ASD how to properly interact with them, although this did not transfer to his peers: "He still doesn't know to be gentle with his peers. But he's getting really good with animals. The current cat is letting him know that 'I don't like that.' Like I said, cats have claws."

While babies enjoyed watching the movement of the dogs, and young children tended to bother the dogs, older children's interactions revolved around caring for and playing with the dogs. R.G.'s mother recalled that her 15 year old son "does have to care for him like a big brother and feed him, brush his teeth, groom him, he's the one giving him baths each week." However, the dog is also his playmate:

Is caring like a big brother, also teaching him tricks, they have fun. He's very active. He sets up barriers with laundry baskets, and make him jump, this high, it's amazing. He likes to chase lasers, it's like a cat, so he's running after. He is his biggest playmate.

A.I.'s 11 year old daughter with ASD, T., was responsible for the dog, while her younger, typically developing sister was not:

Our youngest daughter doesn't do any of the care, but T. definitely feeds him, she'll let him in and out the house, she helps care for him as well. The younger daughter would let him out, but then forget that he's out there. She likes to love him, and do the loving stuff, but not the work stuff. But T. happily does that, and if she gets home from school before I get home from work she will take him out and let him go to bathroom. She does more of the caregiver stuff.

In summary, the developmental age of children impacted the type of interaction they had with their companion animals. Initially the children were interested in animals' movement, later they explored the companion animals- sometimes inappropriately, and later some of the children became interested in interacting with their companion animals. Of note was that children who did not grow up with companion animals underwent the exploratory phase regardless of their age.

Gender. In addition to the developmental age, children's gender was found to be a factor in how the children interacted with their companion dogs. Even in the examples above, a certain trend becomes visible, with boys preferring more direct interactions (e.g., physical, rough and tumble play), and girls preferring joint activities (e.g., affectionate,

demonstrative) with their dogs. For example, Sophia's 12 year old son with ASD preferred to tease his favourite dog in a playful way:

You know how some siblings have like a younger sibling they might tease and get them up? I don't know what he does, all I know Fido will go like, like we say oh oh, he's gonna blow. It's something they got going on, he just teases them, that's the bottom line, he teases them. It's just, I can't do what he does, I guess it's the Beagle in him, he makes strange noises, and looks at J. like he's gonna blow. He lets J. know, it's funny.

P.Q.'s older son mentioned that he would play with the dogs "once in a while if I'm outside and they're outside, we usually play catch, I played catch with Fido before". Further, P.Q.'s son mentioned that they continued their physical play with the dogs inside the home too "we run around the house and then the dogs follow us, and then the cat so you've got two boys, 2 dogs and 1 cat running around the house."

Further, S.J. also reported how different her children play with their dog "My daughter is much more patient, she'll sit on the floor and pet him, hug him, and give him treats. My son likes more to rough house with him, throw the ball, chase him, that kind of play."

In conclusion, regardless of having or not ASD, generally boys had active interactions with their companion dogs, while girls engaged in gentler activities with their dogs.

Children's individual traits. Children's individual traits also influenced how they played with their companion dogs, and sometimes children's individual traits overruled gender differences.

Lee's son with ASD, T., described his dog in fuzzy, warm terms: "I think warm cuddly ball of fur that loves his ball and gets his walkies." This was in line with T.'s reflexive way of being, evident in how he cares for his dog: "Most of the time I kick his bed and try to fluff it up for him. Sometimes I find that he [the dog] takes a few minutes when it's fluffed up [looking], he's like, not quite sure, bed was flat, now it's more bumpy." Similarly, when asked how he plays with the dog, T. said that

I usually give him a pet, and I hold my hand out and he gives me few kisses. And when he starts to get anxious for balls, I am like sitting here watching the TV show, and Poodles [motioned throwing], 2 minutes later Poodles [motioned throwing], 3 minutes later Poodles [motioned throwing].

J.C.'s son with ASD did not interact much with the dog, while J.C.'s younger typically developing one-year-old daughter preferred direct physical contact:

He's never really, he would walk by and give her a pat, but he's not really to engage her in play at all. Our younger one, she is focused on the dog like nobody's business. She's not on the autistic spectrum, but she would throw herself on the dog, and lay on the dog, and walk around with the dog, and she's very, VERY engaged with the dog.

In contrast to Lee's older son, Lee mentioned that her younger typically developing son interacts differently with the dog, "H. can sort of pester him sometimes. He can at times almost be on the cruel side to him. Pulling his tail, yanking his ears, you know, do something."

Another individual trait that influenced the interactions between children and their dogs was the extent of their attraction to animals. For example, A.I. noticed that her

daughter with ASD “definitely has an affinity for animals.” In contrast, J.C. described that her son with ASD is totally disengaged from animals “...they have otters, meerkats, little monkeys, and he would rather play in a puddle. He didn’t want to look at any of the animals. ”

Another property of the child-dog interaction was walking the dogs. According to V.A., her son with ASD prefers to interact with his dog by walking together for long periods of time: “He has lots of anxiety, and he walks to wear out that anxiety. He doesn’t take any medication, and he takes the dog... it’s always at the end of the leash, even if it’s hours.” Similarly, M.E. mentioned that her oldest daughter is a very reserved young adult: “Aside from Asperger’s, she’s just very shy... she doesn’t like laughing at people, very conscious about hurting someone’s feelings. She never said anything bad about somebody, never in her life.” Her interactions with the companion dogs are a reflection of her interactions with people “that’s her way, she’s kinda looking at them, she’s a very calm person... and she walks them a lot, she does most of the walking.”

In conclusion, children’s individual characteristics influenced their interactions with their companion dogs, regardless of gender and diagnosis.

Social circle. Another factor that influenced children’s interactions with their companion dogs was related to children’s social life. Children who were involved in after-school activities and who had a larger number of friends did not interact as much with the dogs. For example, A.I. said her typically developing daughter “doesn’t interact nearly as much [as her sister]... She has so many other interests, she has SO many other interests. She has classes, courses, friends, a very full life.” In contrast, A.I.’s daughter

with ASD is “Much more focused on the dog, much much much much more focused on the dog” because “She has little to no social life.”

Although children with ASD tended to have limited social circles, they were not the only ones. R.G. described her typically developing son as not being socially active. As she put it, “Although he is 15, he doesn’t hang out with friends, nobody really calls the house, he’s not talking to a lot of friends... He doesn’t have a lot of other social interactions”. Like socially isolated children with ASD, R.G. described her son’s relationship with the dog as being “like brothers...he calls him his buddy.”

Similarly, J.O. described her son with ASD as having a nonexistent social circle before adopting the dog “Because J. didn’t have any friends, so the first thing we thought was if we had a dog, if he had any issues he can always talk to his dog and that was the main reason for getting the dog.”

Likewise, single children also developed a strong relationship with their dogs. K.K. mentioned that her daughter “says he’s her brother.” Fearing their strong relationship, K.K. allows her daughter to sleep with the dog in the room only on weekends “It’s like a weekend treat, cause during the week I don’t think she’ll fall asleep on time... is just somebody to be up with, like a friend.”

In conclusion, the children who were not engaged in extra scholastic activities or had a limited social circles spent more time with their companion dogs than the children who were involved in more activities or had larger social circles.

Dog knowledge. Knowledge of dog behaviour moderated children’s interactions with their companion dogs, and it was important mostly to older children. Older children who were more knowledgeable of dog behaviour had better relationships with their

companion dogs. Nevertheless, a difference was noted between someone having an understanding of dog behaviour and someone trying to act in a responsible manner. For example, Lynn's eldest son recently became responsible for taking care of the companion dog, not because of his knowledge of dog behaviour, but as part of his arrangement with his mother. However, this responsibility did not translate in understanding the behaviour of his dog:

I think it is more like a list item, as opposed to somebody might be uncomfortable because they have to go to the bathroom. He's still more about getting his own stuff done, while the dog is standing by the door and she really has to go out.

Similarly, Victor's daughter liked to interact with her dog, but she did not know how to interact effectively with the dog. Victor explained, "I think she was frustrated in the beginning because she couldn't get Fido to respond." Even 10 years later, the situation did not change "If C. says come, Fido will not come, but she'll listen to everyone else."

In contrast, K.K.'s daughter was able to control the dog both on and off leash. Although there were more factors involved than just dog knowledge, her knowledge of the dog is a part of this successful interaction with the dog, "She takes the dog with her anywhere. There's a park next door, and she takes him everywhere she goes. She likes to walk him, just playing on the swing set she has him right beside her."

Characteristics of Parents

The *characteristics of parents* (i.e., *gender, individual traits, and dog-related family conflicts*), were interrelated and influenced the relationships between them and their companion dogs.

Gender. As with their children, there were gender differences concerning parents' interactions with the companion dogs. Relative to men, women were more likely to initiate the process of adopting or buying a dog, were more likely to be the main caregiver, and talked and interacted more with the dogs.

As previously mentioned, mothers were more likely to initiate the process of adopting or buying a dog. In Cujo's case, her husband, Marvin, was not against having a dog, but he was also not ready to have a dog right away. However, Cujo mentioned that "when I saw him, I loved him and I had to have him. My husband wasn't ready at the time, he didn't want to have a dog, and I said we have to get this dog." Similarly, C.N.'s husband did not want to have dogs. Nevertheless, having dogs was something natural for C.N.: "Fido1 was supposed to be my training partner, I was going to pursue more competitive dog obedience with him, and dogs sports. With Fido2, she was intended to be a breeding dog." In contrast to C.N.'s passion for dogs, her husband had dogs in his life because of his wife. As she put it, "they fit in because I make them fit into his life." While women tended to provide emotional reasons for having or interacting with dogs, men viewed the dogs from a more pragmatic perspective. Men seemed to prefer having other companion animals, such as cats, birds, or fish, while dogs to them were perceived as "more work."

However, men with greater knowledge of dog behaviour, or men who had positive previous experiences with companion dogs, were more likely to initiate getting a dog for the family. For example, M.K. had a long history of having dogs, and he was described as having a good relationship with them. According to his wife, "M.K. really loves dogs, he said he was pretty close to his dogs... My husband wanted a dog. I never

wanted a dog, I never had one, I wanted a cat.” In contrast, Victor did not want to have a dog although he had dogs previously: “I sort of like begrudgingly accepted the dog.” His reluctance was based on his negative experiences with the previous dogs “I had a couple of dogs, and really didn’t know how to train them, and really didn’t take care of them.”

Another difference was that women reported feeling safer having the dogs, both inside their houses and outdoors. Although aware that her dogs were not trained for guarding, C.N. mentioned that she feels more secure with them around “little bit of protection, alarm system that’s for sure.” Likewise, having her dog around was important for K.K. because “Fido always barks if there’s someone.”

Another difference was that the women were more involved in the caretaking of their companion dogs. Although in some cases the men and children helped as well, women were the ones monitoring the dogs’ wellbeing. For example, S.J. mentioned that, although her children have some responsibilities, she is the main caregiver: “They’re supposed to clean up the backyard of dog doo-doo, they sorta do. They’re responsible for brushing him, which they sorta do, so I’d say I mostly do it all.” Similarly, Lee mentioned that it is natural for her to take care of the dog, because “It’s just a mom thing to do, oh, has he been fed, has he been walked, and I am the one home.”

Similar to children, parents differed in how they played with their dogs. Both women and men played with their dogs, but men preferred to roughhouse with the dogs. This type of play was not approved of by women, due to safety concerns for their children, and for their dogs’ interactions with other people. For example, K.K. stopped her husband from roughhousing with the dog due to safety concerns:

they're not allowed to. I know M.K. used to wrestle with him but I never wanted him to be like that, especially with D., our baby boy that is on his way, I don't want Fido to play-bite. Fido does this with you at odd times, and I don't want him to think that he can play-bite with anyone.

Likewise, P.I. reported that he liked to play rough with the dog, and the dog reciprocates "And he likes to play rough when I do that as well." In contrast, the play between the dog and his wife or his daughters was not nearly as involved "he pulls a little bit with her, but he won't even pull with the girls." Although in this case the dog also contributed to the different play style, there was a clear gender difference in parent play style as well.

Individual traits. As noted previously, gender was associated with the reasons given for adopting and caring for their dogs. These processes, as well as the processes through which the dogs were adopted, were closely related to individual traits. Some participants researched what is involved in getting a dog online, asked their friends, and read books on this topic. They were more likely to search for information about specific breeds that might be a good fit for their families, and to research breeders before becoming interested in specific dogs within that breed. In contrast, other participants chose their dogs for on emotional reasons.

For example, according to P.I., his wife always researched extensively before choosing a specific item: "if she's gonna buy something, anything, and there's more than one brand, or more than one of these, she would take a month or more to research it." The process of finding a dog for her family was also based on a research approach, according to P.I.'s wife

We knew we wanted a small breed dog, we knew we wanted a not-high-shedder.

So first we narrowed it down to what breed we liked, and we knew we didn't want to go through bringing up a puppy... so we wanted something that was house-broken, something that would be a little easier to manage.

In contrast, Lynn had a more detached approach to finding a dog. She mentioned that "I found her on the internet. I called the shelter, had them hold her, and the ex and the kids went and brought her home."

The reasons parents adopted their companion dogs varied from emotional to pragmatic. Moira mentioned an emotional need: "Umm, it was the alternative to having a child... he knew I wanted a dog, like I needed the dog. I think he would've preferred to not to, but I said you want a human or a dog?" In contrast, C.N adopted one of her dogs for a very pragmatic reason, namely "she was intended to be a breeding dog." Other parents adopted the dog to help their children. For example, A.I said "We actually got him with the purpose of having him as a companion for T. We've done some reading which suggested that kids with special needs do very well with pets."

Another category where the parents differed was their way of interacting with the companion dog. This was related to how much time they had for the dogs, to how they spent this time with their dog, and to how they interacted with their dog. For example, V.A. reported that she had a busy life, so she did not have much time for the dog. In fact, the dog was acquired for her husband, but he is as busy "we are very very busy people-my husband and I own a consulting company, and we have 16 employees, and we travel a lot with work." Consequently, the children, who were young adolescents, were the ones charged with walking the dog "yeah, was supposed to make him walk, but it didn't

work... But he ended up saying ‘Kids, take the dog for a walk.’” In contrast, R.G. mentioned that her dog fits their active lifestyle “We are active people, my husband took him for a bike ride, carrying him with one hand from here on a bicycle to a path, and put him down and went cross-country, he just follows him.”

Knowing. *Knowing* was defined as parents’ previous or acquired knowledge about dog behaviour. *Knowing* affected parents’ expectations from the dog, which in turn affected the benefits they received from their dogs. Parents who knew more about dog behaviour registered more benefits from their dog’s presence. For example, in numerous cases, parents reported that their dog knowledge was based on their own or their partner’s experience with previous dogs. Almost everyone had taken obedience courses with their dogs. Sophia went with one of her dogs to an obedience class, “ ‘cause we didn’t have a clue. We never had a dog before. My husband had a dog when he was young, but believe me, we needed it. We needed some lessons and guidance on what to do.” However, attending obedience training did not translate in knowledge of dog behaviour. Although Sophia went to an obedience class, she expected her dogs to know how to retrieve a ball simply because other dogs do this “They get all excited, they love it, but they don’t come back with it immediately. I see other dogs, and it’s like oh, they don’t get it. As much as they do it, they’re not as good as other dogs.”

Previous experience with dogs was not always positive, for example V.A.’s first dog bit her oldest son “once, I had to take him to the hospital. He had a little puncture.” She pondered over what went wrong, saying, “in hindsight he was my first dog as an adult. I had dogs before, but I don’t think I knew how to train him, spoiled him too much, and he didn’t know how to behave.” However, even with her present dog, V.A.’s

knowledge of dog behaviour was not evident in how the dog reacted at the door: “he goes crazy when the dog bell rings. Like he’s very territorial... I think he gets away with it because he’s small, but I think that what he’s doing is aggressive.”

Similarly, J.O.’s knowledge about dogs was based on researching about dogs, asking friends, and relying on her husband’s previous experience. Although the research seemed extensive, their dog’s behaviour was not properly understood. For example, during the interview, J.O.’s husband tried to demonstrate to the interviewer how obedient the dog was. However, the dog did not obey any commands during the demonstration “sit, sit, sit, sit, you sit, sit, [J.O. pushed down on dog’s back] No no, you shouldn’t. Sit, oh oh, sit, sit, sit, maybe he is too hyper, too many people.”

Both V.A. and J.O. considered the behaviour of their dogs to be normal. V.A. reported that her dog’s behaviour is due to his personality, “very hyper.” J.O.’s husband considered the dog as being “a very well mannered dog, very well trained, very smart dog.” In the larger picture, the two families appeared to enjoy the presence of their dogs, and the reported misbehaviours were ignored.

In contrast, C.N. was a professional dog trainer, with extensive knowledge of dog behaviour. By understanding dog behaviour, she was able to avoid the negative experiences of some mothers when having a young child. For example, she changed the dogs’ routines in order to accommodate the newly born baby:

I had to teach the dogs to get out of the way. Before I was stepping over them, especially at night. But it’s hard to notice them at night, and if you step on them they squeal and such. Now, with the baby was difficult because it was hard to balance and such, so I taught them to move away from my way.

However, parents' dog knowledge did not automatically influence their children's attitudes towards the dog. For example, parents with extensive knowledge of dog behaviour could not increase their children's interest in their dogs. J.C.'s child with ASD was not interested in dogs, or animals in general. At around three years of age, he told his mother that "I don't like anything that poops." Even though J.C. tried to instill the passion for dogs in her son by taking him to dog shows, teaching him about dog breeds, having many breeds of dog present in the home, having him see puppies, and taking him to zoos, he remained uninterested. When asked whether she tried to get her son interested in dogs, J.C. replied that "Oh YEAH, oh YEAH. Because I had dreams of going to the dog show, I mean I literally used to bring him to the dog shows in a backpack, when he was a baby. NO. I had high hopes that he would be."

Expecting. *Expecting* referred to parents' expectations from their companion dogs. *Knowing* influenced parents' expectations. Parents with previous dog knowledge were more likely to have realistic expectations of their dogs, relative to parents with little knowledge of dog behaviour. Participants with unrealistic expectations, who researched and learned about dog behaviour after obtaining their dogs, typically reconsidered their expectations. However, for S.J. and her husband, their expectations were primarily influenced by memories of their previous dogs. Although their expectations for their present dog were met, their relationship with the dog was poor. S.J. recalled that "Our expectations were that he would be a companion for the family...Umm, our only qualifications for him were that he had to be neutered, he had to have some training, and that he would be medium to large size, not long hair." The dog interacted well with her children "My son is very big hugging him, hugging around the neck, lying on top of him

if he's lying down. My daughter is different, she'll be petting him as he's lying next to her, she'll have her foot on his paw, that kind of thing." However, S.J.'s husband could not reconcile the difference between the present dog and their previous dogs: "I think his expectations were that he wouldn't be so needy as he is... he tolerates the dog, does the best he can, but that's it."

In contrast, for Lee's family, the dog was a good fit for everybody- for the child with ASD and his younger sibling, as well as for parents. For example, the child with ASD expected to have a companion, and, according to him, he obtained it: "I expected a loving dog who would play and would give me kisses, and play, and be a very good addition to our family. I also expected him to be a great friend, and that's exactly what I got." Allan, Lee's husband, wanted a dog unlike their previous one, which he described as being "mean, for a little terrier he was mean." Allan mentioned that "My biggest thing was that I wanted something that was a good family dog... a dog easy to walk and good with children." Lee shared Allan's expectations, except a small regret that the dog is closer to her than to the child with ASD. She reported that "And mine was same thing as Allan, but mine I was hoping he would be more of T.'s dog, it turns out that he's mine more than anybody. I was hoping that he would gravitate that way, and he does, but not as much as I would've liked." Because their expectations were almost met, Lee's family was happy with their dog.

In or Out. *In or Out* was related to the place where the interactions between dogs and their family happened, inside or outside the home. In most cases, the dogs provided more benefits inside the homes, due to their better behaviour there. For example, Cujo

mentioned that her dog has become less responsive when he is let off-leash outside, and as a consequence his behaviour outside is not welcomed by Cujo

So couple years ago I could've yelled at him, although he wasn't as bad a couple of years ago. Now I yell at him and it doesn't matter, he'll keep running, and chasing, and sometimes he's chasing people, and if they come out the house he'll bark at them, and that kind of stuff I don't like as much. Now I put him on a leash so I can control him.

In contrast, a more positive picture of the dog emerged when Cujo was asked about dog's behaviour inside the house "I wouldn't change how affectionate he is. He seems to be very in tune with how we feel, he likes to cuddle and snuggle, he loves to sleep. I wouldn't change anything about him. He's great."

Beth also mentioned that her daughter with ASD was unable to benefit from interacting with the dog outside: "I don't think I would be comfortable with her taking the dog out by herself especially since Fido is sometimes, not aggressive, but unfriendly to other dogs." In contrast, Beth's daughter was able to interact with the dogs inside the house, albeit in a unique way. Beth reported that "she'll comment about them, she'll talk about them, she'll say oh, you know, 'they are such cute dogs' but she's less likely to, you know, maybe go and pet them, touch them or actually talk to them directly."

Family stages. *Family stages* refers to whether the dogs were present in the family before children and whether the children were very young. Before children were present, the parents had closer relationships, more frequent interactions, and qualitatively different interactions with their dogs. Before having children, S.J. and her husband treated the dog as their "baby". S.J. reported that:

The dog we had before was a German Shepherd, we got him as a puppy, we had him before we had our kids. So he was our dog, mostly my husband's dog... and we trained him and showed him as well. He was basically the baby before we had children, totally different scenario.

For S.J. and her husband the interactions with their dog evolved around working and training him. Cujo talked about anthropomorphizing her dog prior to having her first daughter:

Well, this is going to sound not very nice, but before E., I made Fido more like a person. The day my daughter was born, when I came home after my daughter was born, I never saw him the same way again, never saw him the same way again... I think I realized that, oh yeah, he's not a person. He's a dog. I even hate saying that, but that was very clear for me, from day one.

As indicated in the previous examples, the appearance of children invoked changes in parents' emotional availability for their dogs. Another factor that changed with appearance of children was the amount of time for interacting with dogs. J.C. reported that:

Pretty much based on time. I still showed her for about a year after X. was born, but then I just ran out of time. I mean training was about 9 o'clock, it's just by then I wanted to be in my pajamas, I didn't want to go to dog class. In the weekends, going to Montreal for a dog show, just wasn't feasible, so no, we finished.

Unavailability of time and energy was mentioned by I.B. as well: “Because with my daughter’s diagnosis we just don’t have anything left, so Fido’s become almost like a chore, and we love her, but, we just don’t have the patience anymore.”

Besides the challenges that occurred with arrival of the children, which Marvin described as “like keeping our heads above water,” parents’ interactions with their dogs was changed as a function of the age of their children. Families with young and very young children went through difficult times due to the need to adjust to the new presence in the family. As Marvin mentioned, his interactions with the dog outside suffered “because she was in a stroller, it’s very hard for one person to do it [walk the dog].” Similarly, A.D. mentioned the changes in her interactions with the dog due to her baby’s arrival:

In the winter time, the dog wants to go out, but the baby needs to be wrapped up in a blanket, while the dog’s outside can’t make up her mind where to do it, and just make up your mind and let’s get back inside, you know. We had a year of big adjustments, and unfortunately she’s at the bottom of the totem pole here, so made it a little harder. Yeah, she’s like another kid that needs stuff.

Alternatively, parents with older children relied on children to take care of the dogs, while they pursued their careers. In this regard, M.E. said, “It’s a pain, and more, I am so busy, I get someone else to do it.”

Effects of Companion Dogs in Families with Children with and without ASD

The presence of companion dogs was associated with numerous benefits for children, parents, and the family as a whole. The *match* between the characteristics of the companion dogs and their family members moderated these benefits. The companion

dogs provided children with and without ASD with direct and indirect social support, physical benefits, and an opportunity to learn about responsibility. Further, children with ASD related quicker to their dogs than to other people, learned about the world through their companion dogs, and received more direct social support than children without ASD (i.e., the dogs replaced the absent social circle).

The companion dogs provided the parents with physical benefits, direct and indirect social support, and prepared them for having children, especially children with ASD. However, there were some negative effects for some parents, such as financial burdens, disruptions in daily schedule, and added stressors when the companion dogs were misbehaving. The presence of companion dogs influenced not only the children and their parents, but influenced the whole family, by increasing the family cohesiveness, by mediating family conflicts, and by increasing the quality time between parents and their children.

Lastly, the analyses for this project suggested that the bond between participants and their companion dogs depended on the *match* between their characteristics.

Children's bond to companion dogs. Various definitions have been used in the literature for the bond or attachment between humans and companion animals. The definition used for the present project was bonding as an emotional connection felt by the guardian (Budge, Spicer, Jones, & St. George, 1998).

The results of this study suggested that the bond of children with and without ASD with their companion dogs varied based on the match between children's and dogs' characteristics. According to the analyses, time spent with the dog is not indicative of the emotional bond between children and dog. For example, J.C.'s son did not spend much

time with the dog: “He’s never really, he would walk by and give her a pat, but he’s not really to engage her.” Although J.C.’s son interacted very sporadically with the dog, he seemed to have an emotional connection with the dog:

When we lost Fido, 3 years ago, so he would’ve just turned 3, it took him about 6 months to really understand that. But he was really upset, he felt the loss of the dog quite keenly. He loves them, and he’d tell people ‘we have a dog, we have a cat’, he can talk about them. He just doesn’t really interact with them.

Similarly, P. Q’s eldest son did not interact with the dogs, but he wanted to have them in his room during the night. As his mother put it, “he doesn’t want anything to do with them but at night-time he wants them in his room.”

Due to individual traits, children’s interactions and emotional bond with the dogs was expressed in different ways. M.E. described how her children thought and interacted with the dogs:

She’ll grab them, and do things that are annoying. She’s done this since we’ve had them, she’s the youngest ... C., they have been very good to her because they forced her to pay attention, when she closes in, it forces her to pay attention to them. And my son, at first, he was a bit more aloof, but they’re very special, just the other day like I said, they’re 6 years old, and he asked how long they gonna live. I said these dogs usually last for 12 years or so, and he said make sure I am not home the day something happens to Fido2, the bigger one.

Dogs’ personality moderated children’s bond to them. Children whose dogs reciprocated their interest were more likely to have a stronger bond with their dogs than children whose dogs were not interested in interacting with them. V.A. mentioned that

her son did not bond with the first dog, in part because of his characteristics, “S. as a little guy was really really hyper,” and in part because of dog’s characteristics, “that dog didn’t like S. ... he bit him once... But there was something natural about this dog not liking S., because when my daughter came along, he loved her. That dog would lick her, and sit in her bed, that dog adored her, couldn’t stand S.” In contrast, A.I.’s daughter liked calm interactions with her dog, and the dog reciprocated: “like I said, he’s very aware of her emotions, he’s very aware of when she’s upset, definitely right with her. He’s very patient with her, she can roll him over and she can lay her head on him, and there are no problems with anything she does to him.”

Lastly, children’s bond with their dogs was at times influenced by the dog’s relationship with the parents. For example, A.I.’s daughter’s relationship with the dog was influenced by dog’s connection with her father, P.I. “he’s so focused on P.I.” Although the dog was hers, the dog was more attracted to her father and preferred his company:

When we adopted him, it was actually T. who adopted him, she signed the papers for adoption, and we had all intentions to have him her dog, and sleep in her room, but he’s chosen differently. Occasionally he’ll go and sleep on her bed, but most nights he’s with us.

This was a common thread among the interviewed families, with parents reporting that their dogs responded better to them than to their children.

Parents’ bond to the companion dogs. Concerning the bond between parents and their companion dogs, for some it was instantaneous, for some it developed over time, and for some it never developed. The initial bonding was based on parents’

expectations and knowledge of dog behaviour. After the initial emotional attachment, the bond developed or regressed based on their *match*. If there was a good *match*, the bond remained constant or became stronger. For example, Cujo chose her dog based on his visual appearance, no individual tests have been performed. She recalled the moment when she chose the dog: “This dog is talking to me, is speaking to me, I need this dog. He was at a pet store, so we bought him that day.” Cujo expected that the dog would be close to her. She said, “I expected him to cuddle and love me.” I speculate that without the *match* between the characteristics of Cujo and her dog, Cujo would not have maintained her strong bond to the dog:

Wakes up with us, cuddling with us in the bed, he’s a bed hog... If you stay in bed he stays with you until the cows come home, he loves to sleep... Wherever you are, he also wants to be. When we leave he wants to come with us, when we stay in bed he’ll stay in bed with you.

In contrast, the characteristics of J.C.’s present dog did not match her characteristics. For J.C., the characteristics of her previous dog were a better match to her own characteristics and so she was more closely bonded to her previous dog:

J.C.: I can’t, I, just not my favourite. Her sister was my favourite, but you know, she’s still part of the family.

Interviewer: She’s not the favourite one because?

J.C.: Some dogs are more special, and her sister was really special.

Interviewer: In what way?

J.C.: More of a connection. She is more of a dog, where previous dog was really kind of, really special, we had a really good connection. She is just a dog.

Interviewer: Was your previous dog more demanding, was she....?

J.C.: No, she had more of a, she was very calming on people, she was a very good therapy dog. This is more of an entertainer kind of dog, previous dog was very calm, she'd just go and put her head on people, very calm, very peaceful, very calm dog.

If there was no *match*, it was due to parents' unrealistic expectations and lack of knowledge of dog behaviour, which resulted in a weaker bond to the companion dogs. For example, Lynn's bond with her dog was weaker, although she had an initial bond with the dog "I found her on the internet, I called the shelter had them hold her."

However, the dog's characteristics were not what Lynn envisioned:

She doesn't seem overly attached to us. She's always where I am, but she's not one of those dogs that have to be right up close to you... If she's outside, she'll go wander, waaaaay off, or I know many other people dogs stay close to where they are all the time. I don't find she's attached.

Lynn's attitude to her dog was ambivalent, oscillating between praising her and finding her faults, reflective of a lesser bond:

I'd say I am attached to her emotionally. Like if anything were to happen, like she were to bite, or something like that, she'd have to go. That is why I say she's an animal, I have to keep that in my mind. Because if anything did have to happen, or had happened, I would have to get rid of her. So I try to keep some distance, but no, she's great, she's awesome, she's a good dog.

The previous examples portrayed several examples of attachment to dogs. Cujo had a strong bond, probably due to a good *match* between her own and her dog's

characteristics. J.C. did not have a strong bond, possibly because they were not well matched, and Lynn had a weak bond due her unrealistic expectations and lack of knowledge of dog behaviour.

In the following example, A.I. did not have dogs before the present one, and her knowledge of dog behaviour was minimal. This was reflected in her expectations:

I think the general message from seeing other people, the faithful dog that is waiting outside at the post office door off leash for his master, those kinds of things you see. That the dog is your best friend, it's your companion, and you're its master and he wants to please you. Fido doesn't necessarily always want to please us.

However, her husband, P.I., had different expectations of the dog, probably due to his previous experience with dogs:

P. I. I on the other hand, I think he's a little smarter than most dogs, than the ones I had anyway. And he interacts with us more. When he does really silly things, I am used to these. She is like 'why is he doing this'? Well, it's a dog.

A. I. Yeah, he didn't meet my expectations of what a dog would be in our family. I envisioned a closer bond with the girls, and part is bringing a dog home and having a bond with you as a puppy and bring it as an adult and having that relationship with you. A lot of friends have dogs that walk right beside them, it's that really close bond, connection. Fido has that with us, but I don't think it's to the same degree as if we brought him home as a puppy... I really had high expectations of what a dog would be, that we would be able to leave him for the day, or say come and have him come right away. Same with when you have kids,

right, you expect them to listen to everything you tell them the moment you tell them, and he's not that. I expected him to do all those things exactly perfect, from the beginning.

By observing the important effect on her daughter with ASD, and by learning more about dog behaviour “stuff I've read about how you can do this and how you can do that. And I've consulted a behaviour consultant” A.I. adjusted her expectations: “So we've tried different things with him, but I guess we also accepted. Does he ever gonna have perfect recall? He's 5, maybe 6 now, probably not.” Adjusting her expectations, and having a better understanding of dog behaviour allowed A.I. to bond strongly with her dog. This was exemplified in her account of missing the dog's presence, which was typical of many participants:

We went recently to Vermont, we left him with a sitter for a week, the longest we left him, and we were thinking how he's doing, we called the sitter a couple of times, to check on the dog, so yeah, we're very attached to him.

In summary, parents' bond to their dogs was dependent on the match, as well as on their expectations and knowledge of dog behaviour. Although some participants reported an emotional connection with the dog at first sight, this connection was not permanent for all, being influenced by dog knowledge and expectations.

Effects of companion dogs for children with and without ASD. As previously mentioned, the dogs provided children with direct social support- including emotional support, indirect social support, physical benefits, and an opportunity to learn about responsibility. In addition, the children with ASD learned about the world through their

companion dogs, they related quicker to their dogs than to the people around them, and the dogs acted as a replacement for their lack of friends.

Because parents were in all cases establishing the guidelines for interacting with the companion dogs, their knowledge of dog behaviour moderated the children's benefits. For example, C.N., who had extensive knowledge of dog behaviour, did not try to encourage or discourage her son's interactions with the dog, but she ensured that her child could have safe access to the dogs when he wanted, and that the dogs were safe as well:

If he [her son] does something to them they move away, which I have encouraged since he's been able to move. In order to avoid conflict, I taught them that if he's around you need to move so that they never got into a fight. You know, their option was you need to move rather than bite.

In contrast, other parents limited the interactions between their children and the dog. For example, although K.K. mentioned that her daughter wanted to sleep with the dog in the room "she does ask for him all the time, but she knows the rules," the rules are that the dog sleeps in her room only on weekends:

We just do it mostly on the weekends for B., when it's her fun time, when she doesn't have to go to bed on time. But during the week, sometimes I think she hangs out and plays with the dog in her bed, and he's not supposed to be on her bed, just in his bed...It's like a weekend treat, 'cause during the week I don't think she'll fall asleep on time.

Social support for children with and without ASD. The companion dogs provided children with and without ASD with companionship and emotional support in the form of nonjudgmental presence and unconditional love.

The dogs acted as playmates for both children with and without ASD, inside and outside the homes. The dogs played with the children outside their homes, and acted as friends, especially for those without siblings. K.K.'s daughter "likes to walk him; just playing on the swing set she has him right beside her. She says he's her brother, but they're just like best friends too." C.N.'s son has played with the dogs outside because the house rules: "they're not allowed to play in the house, they're never been allowed to play in the house, because that's the way things get broken, so they get sent outside to play. Whereas outside they can rock'n roll and play and do all that stuff."

The dogs provided companionship to the children inside the homes as well. For example, R.G.'s son played with the dog as an alternative to computer games: "He's becoming like his playmate. Other than games and internet life, he is like his real playmate." Likewise, M.E. described how one of her daughters liked to play with the dogs inside, "Well, I mean, she runs around and plays with them, she gets on her hands and knees and plays with them." According to M.E., the dogs provided her daughter with "two more kids that she plays with."

In addition to being playmates for children, the companion dogs also provided emotional support to the children. J.O. mentioned that her son with ASD had a difficult time at school due to being constantly bullied. The dog provided him with a source of support at home: "this was the time in school when he started to get bullied, and he still gets bullied, but has this dog when he comes home, waiting for him at the door."

Similarly, when A.I.'s daughter with ASD has a difficult day, the dog can provide support that the parents cannot, "If we're having a really really bad day with T., he can bring her down, he can unwind her, it's great."

In addition to being there for children at difficult times, the companion dogs were a source of unconditional love. Sophia suggested that the dogs were a source of happiness for her oldest son "I think it's brought, especially for D. a lot of happiness, always somebody to play with." Similarly, R.G. mentioned that her son was happier due to dog's presence: "There's more laughter, he laughs more. More laughs, more smiles, more play, because of the interaction with him. Without Fido he is more isolated in his room." Further, Sophia mentioned that, although unable to measure this, the dogs provided her son with comfort through their unconditional love:

we got the dog for D, because he was a difficult child, I can't tell you. And I'd feel like he's not feeling being unconditionally loved because I was so upset at him so often, because he was defiant, he wouldn't go to school, he would have fits. So I said this boy needs some unconditional love, some stability, something to make him feel that he's okay the way he is, that's how I wanted him to feel.

Similarly, Moira's son with ASD received constant support from his companion dog, unlike from his friends. Because of his behaviour, Moira's son's relationships with his friends were "going through valleys and peaks." In contrast, his dog was a nonjudgmental companion:

he provides A. with a friend without the pressure or the judgment of other kids, and A. treats him like 'oh my brother.' So he does have that brother or that sibling attachment, even though it's a dog... What's nice with Fido, because my

son perceives rejection from people, he knows that with Fido when A. comes into the room that is that ‘ooohh, A.’s coming into the room.’ It does have that nonjudgmental, he’s genuinely happy to see A.

Both children with and without ASD talked to their dogs, and in some cases even read to their dogs, such as A.I.’s daughter with ASD, “They’re big readers, she’ll crawl upon the loveseat in the other room and she’ll invite him beside her under a blanket and she’ll read with him.”

The companion dogs also provided the children with indirect social support, facilitating their interactions with others. For example, J.C.’s son with ASD talks to people about his animals: “he’d tell people ‘we have a dog, we have a cat,’ he can talk about them.”

Physical benefits for children with and without ASD. The children participating in this project benefited physically from interacting with their companion dogs. R.G.’s son “is interested in computers, he’s always locked in his room.” Although R.G.’s son “doesn’t do any other physical exercise. I tried to get him into that, play tennis and things, but he doesn’t like anything,” he enjoys physically playing with his dog:

Is caring like a big brother, also teaching him tricks, they have fun. He’s very active. He sets up barriers with laundry baskets, and makes him jump, this high, it’s amazing. He likes to chase lasers, it’s like a cat, so he’s running after...

When we go out for a walk, during the week, he never has any problem, although walking the dog is also part of the exercise, and time spent with mom and the dog. Similarly, Lee’s son also found it pleasant to walk his dog, “Oh yeah, I find it very relaxing, taking him on a nice nature walk.” J.O.’s son also benefited physically, by

walking the dog “J. is getting bigger and having Fido and having to walk him is a good thing.” Sophia mentioned that she and her younger son walk the dogs together each day “in the evening we go for a walk. Usually is about an hour and a half we’re out, and J decides on the walk.” Although Sophia and her son have an active life, walking the dogs is a daily physical activity that they both enjoy:

Sophia: Like he is in an amazing shape. Especially in the summer, he didn’t want to walk with the dogs, he wanted to run with the dogs. So I know he is physically, definitely because of the dogs.

Interviewer: Was J. doing any physical activities before walking the dogs?

Sophia: Not too much. We like to bike, he didn’t like team sports, so that’s why this is good. We do lots of swimming, but swimming is just once per week, you know. So this was something daily to do. Biking is only in the summer, and skating in the winter, but you don’t skate every day, it’s just a consistent routine that is daily and I know it helped him.

Learning responsibility by caring for dogs. A common theme among the interviewed families was that companion dogs teach children responsibility. P.Q. mentioned that her boys learned about responsibility by taking care of the dogs: “it’s taught them a little bit of tolerance and I guess taking care of them ‘cause actually they do. They are responsible for giving them food and water and he [the typically developing son] actually cleans up.” Lynn wanted her son with ASD to become more aware of other people, and thought that caring for the dog would make him aware of others: “My son let’s her out and in the house when she has to go to the bathroom, and he’s responsible for watering and feeding her... And I thought that would be good for him to start to care

for someone else, be responsible for someone else.” Beth mentioned that, over the years, her daughter “took on some, well, a little more responsibility” for the dog.

Being responsible for the dog, in part or in totality, was related to children’s dog knowledge and age. Cujo and Marvin mentioned that their daughter did not have sufficient knowledge to understand their dog’s behaviour, and that she did not yet have responsibilities for him:

she’s being only 4 years old, she doesn’t understand that, but I think that as she is growing older she’ll understand more of that. She understands when he is bad, but does she know when he’s hungry, no.

Effects of companion dogs for children with ASD. As the next examples will show, the children with ASD related quicker to their dogs than to other people, learned about the world through their companion dogs, and received more direct and indirect social support (i.e., the dogs replaced the absent social circle, and facilitated interactions outdoors) than typically developing children. The *match* between the children and their dogs moderated these benefits.

A.I. mentioned that her daughter is able to relate to her dog in a way she cannot do with people. More specifically, she enjoys physical contact with her dog, but not with her parents or siblings:

I think her favourite stuff is when he’s physically on her, when he climbs in her lap on the couch. I think she likes to have him close against her, which is interesting because she won’t touch anybody in the family. She’s not demonstrative with people. If I sit next to T. on the couch, no part of her body

wants to touch my body. But she's very welcoming to say 'Come sit on me Fido, put your head on me Fido,' or crawls behind him.

M.E.'s daughter would also be affectionate toward the dogs, but not toward her family:

"She's coming more out of her shell, these dogs are a way. She wouldn't come give me a hug or a kiss, but she'll hug and kiss the dogs and stuff like that."

In addition, the language development of I.B.'s daughter seemed to have been related to her interest in her companion dog: "Like yesterday saw a picture of Fido, and my mother-in-law has two dogs, and she said the longest phrase she has ever said. She said 'It's a dog, it has ears, it's so cute, there's 3 of them.'"

Another beneficial effect related to the presence of companion dogs was related to children's with ASD routines. A.I. described getting her daughter ready for school was quite a challenge before adopting the dog:

She [the daughter] had a lot of trouble going to school in the morning, so mornings were very very very stressful time for her. Having him, we were able to say 'we have to take Fido for a walk,' because at that time we had a school that we could actually walk to, so it took the focus off having to go to school to we have to get Fido now, and you have to get ready now. Not to go to school, but to go out with Fido, and she was much much more happy to do that.

Moirra mentioned that her son understands behavioural concepts more readily if they are explained in terms related to his dogs: "When I need to explain something to A., I use Fido as an example. If he does something to another human being he doesn't get it, but if I explain it in terms of Fido, he gets it. I'm like would you go and hit, or kick Fido?"

Relating to dogs had some side effects as well, as J.C. described:

we used to joke that being raised with all these puppies around he kinda goes to the park and he treats the other children the same way, 'cause of the puppies he's used to that way of push out of the way. So with kids he wouldn't think twice about moving them out from his personal space.

The presence of companion dogs, and the fact that the children with ASD with a better match related more quickly to them, provided an opportunity for parents to teach the children different concepts. For example, I.B. mentioned that presence of her dog is a good opportunity to show her daughter concepts: "we can also model some things, like Fido is excited, or she is loud." Lynn also tried to explain the concept of empathy to her son by using the dog as an example:

I have tried, I tried to teach N. to be empathetic or sympathetic towards people.

Like with N. not feeding her, he [her son] goes to get a drink of water. Oh, look at that, you got a nice drink of water for yourself, and the dog dish has no water in it. How would you feel if I said no, you can't have a drink. I don't care if you're thirsty.

Similarly, Victor described the dog as a powerful model for positive interactions for his daughter with ASD: "Much more consistent around the positive emotions than any of the other humans in her life. Buddha dog."

Understanding dog behaviour enabled children with ASD to understand various concepts using the dog as an example, such as Moira's son:

He gets the social cues, the nonverbal cues that Fido provides. He can tell by him wagging his tail. I also found that A. is very inquisitive, so he'd start asking

questions about the dog, just general medical things about the dog. This is something I really appreciate, because I like him, the way he thinks. I find that the dog is a very good learning tool for A., because he'll make stupid comments about the dog, and I'll ask 'do you think that Fido would appreciate that?'"

M.O. also mentioned that the nonjudgmental presence of the dog helped with his son's atypical behaviours, such as fixating on a specific topic:

J. can talk to somebody half an hour on the same subject so might drive people a little away whereas the dog will still be there, so that's been really good for him that way.

Lastly, the companion dogs provided the children with ASD with support when they lacked friends. For example, J.O. mentioned that the dog acted as "another companion, cause he doesn't have that many friends." Lee's son with ASD said: "I love dogs, I like to interact with them, but I don't like to interact with people."

In addition to providing direct social support, the companion dogs provided the children with indirect social support by facilitating social interactions outdoors with other people. For example, A.I described how having a dog transformed the interactions with other people. Prior to having her companion dog, A.I's daughter would not interact with other people under any circumstances:

A.I.: As I mentioned earlier, it opened her up to have conversations with people when we're out for a walk, she's definitely more open to talking to strangers about her dog.

Interviewer: Before Fido, when you had the family walks, there were no interactions with strangers?

A.I.: No, and I think it's actually gone even a little further than that. I think she actually now she sees other people's dogs, particularly Bostons. If we're somewhere near Bostons, she'll actually approach people and say 'can I pet your dog? We have a Boston at home, and his name is Fido, and he's really big'. She would never have approached people like that before, ever. I think it really opened her up to doing that.

Similarly, J.O.'s son with ASD also received indirect social support from their companion dog:

J.O.: J. would take the dog out and actually talk to people in the park, eh? Which is lovely because it gives an invitation for people to come and talk to you when you have a dog.

Effects of companion dogs on parents. The companion dogs also provided the parents with physical benefits, direct and indirect social support, and prepared them for having children. However, there were also negative effects associated with presence of companion dogs, such as financial burden, disruptions in daily schedule, and added stress when dogs misbehaved.

Physical benefits for parents. Similar to the effects on children, companion dogs encouraged parents' physical activity through playing and walking. Parents reported that their physical activity level increased after getting the dogs. For example, P.I. said "We do a lot of walking. Physically we do a lot of walking." Similarly, Sophia said "we have a nice long walk in the evening, and if I'm home in the day then definitely I'll make time to get them for a day walk so they get a nice walk in the day."

Social support for parents. Companion dogs provided both direct and indirect social support. The direct social support came in the form of emotional support, companionship, and the provision of parenting skills to the future parents.

V.A. talked about her dog as a source of relief, something that balanced her “busy” work life:

I think that he’s a source of relaxation. I think that most of all he’s a distraction, because he’s very hyper, so he does things that are funny. So you might be writing your report, and the dog would throw the ball – he can throw a ball, like he’ll play on his own... So more than anything he’s a distraction, comic relief and distraction.

Sophia also mentioned that the dogs acted as a source of relief, by talking to them in a baby-talk voice:

I always say that I have to stop being mental, that I’m mental again, which means that I am in this kind of excited way, I can’t explain it cause they’re not here. Getting excited and talking in a silly way with the dogs [laughing]... They always bring happiness, like we can’t feel sad. So yeah, definitely it’s a lot of joy.

Other parents also engaged in baby-talk and described their dogs as responding to this type of talk. In this regard, C.N. said:

she responds more affectionately with it, she seems to enjoy it more than the male... oh yeah, their body language is wiggly, soft, mouth open, they definitely know there’s a difference or that I’m happy. [laughing] They know when I’m happy.

Most participants reported enjoying the companionship of their dogs, such as

P.O.:

I guess they are just here, it's nice having them here the rare times that I'm home alone it's nice actually having the animals around, somebody to talk to, just somebody to know that I'm not in the house alone.

The perceived support parents received from their companion dogs was moderated by their children's presence. Participants who had dogs prior to getting married, or prior to having children, reported receiving more support from their dogs. For example I.B. reported about her relationship with her dog prior to being in a relationship: "I was single for a long time when I had her... For a long time Fido was my baby, and she was one of the first persons, err, one of the first beings, and I adored her, she was everything to me."

In addition to the direct social support, the parents also benefited from indirect social support. The dogs facilitated social interactions for the parents, especially if they had no children or their children were older. Although Victor reported having an active social life, meeting many people "I always have been very active in my community," he mentioned that the dog provided him with a new world, the *dog tribe* people "I realized that now I am part of the dog tribe. A whole group of people who go to places in the morning and in the evening." Similarly, Marvin mentioned that, before having their first child, they used to be more involved with the dog in clubs and activities: "Playgroups for dogs, or the Dachshund group. We were involved in a club, more fundraisers." C.N. also reported that her social network increased due to the activities with her dogs:

We do so many social activities with them. With Fido2, she's breeding so I meet lots of different people and do lots of different things in terms of dog shows. And

Fido1, we do lots of obedience and other sports, more water work, so we meet all sorts of people and going to different training classes and we go down [to the United States] to train and we meet people down there.

Another effect of companion dogs was preparing the future parents for the challenges of parenting. Parents reported that taking care of a dog, unlike other companion animals, helped them learn about responsibilities, about being home more, and about routines, which prepared them for having children, especially children with ASD:

I think Fido made us homebodies, and people with routines, and people who stay home as opposed who go out, and with M. it was pretty much the same, especially when her, you know, when her symptoms, the older she gets, the more she needs her routines... so it kinda prepared us a little bit for the responsibilities of having M.

Similarly, Cujo described taking care of the dog as preparing her for what having a child means: "Oh yeah, bodily fluids, poop, throwing up, whining, those things are really similar. If you could take care of a dog, of all the stuff that comes out of a little dog, you are prepared for a baby."

Indirectly, the companion dogs provided parents with a different perspective of their children with special needs. Sophia mentioned how the dogs helped her see a different facet of her son:

So you see that humane side to him, that he does have love, and concern, and compassion, and that's having a dog, that's bringing out that side in him. That

love, you know, underneath that tuff exterior that's D. is. That softness that just doesn't tolerate the abuse.

Like Sophia, the fact that her son with ASD was able to show these emotions to his dog was also important to Moira. As she put it, "To me it shows that he [her son] has normal human tendencies, I don't know if it makes any sense, but this [his diagnosis] has been very difficult for me."

Negative effects of companion dogs on parents. Although the presence of companion dogs was primarily associated with beneficial effects, parents also reported financial burden, disruptions in their family schedule, and added stress when the dogs misbehaved. The match between companion dogs and their family members moderated these effects- a better match canceled the negative effects of dogs, whereas a weaker match exacerbated them. Lastly, another factor, *dog-related family conflicts*, moderated the effects perceived by parents and the family as a whole.

Only one family, who experienced a series of medical problems with their dog immediately after bringing him home, reported financial burden:

That was a very costly, very big surprise when we got him home. We had to invest a lot of money at first... Yeah, it wasn't very pleasant. The first month with him was actually really, very stressful, and we considered taking him back to the foster home because he was very high maintenance and a lot of money went into him.

However, the benefits outweighed the initial burden, and the high maintenance transformed into "part of the regular routine."

The parents also reported the need to incorporate the dogs in their schedule when going away: “if we want to go away some place, like if we want to go away for the weekend, it’s like ‘what we gonna do with Fido?’” In some cases, the dogs are left behind because they will not enjoy the trip, as A.D. reported “We went to Thunder Bay, two days, and I didn’t have anyone to look after, and she threw up, and she drools, and you can see she’s not happy.”

Besides the cost and the need to arrange for dogs, the parents perceived the dogs as stressors when they misbehaved and when the dogs interfered with the needs of children. For example, I.B. mentioned that “We were really nervous, and we hired a dog trainer, at a horrible time. I was a week away from delivery, ‘cause we were really concerned about the baby,” and J.C. mentioned that her dogs “bark, they wake up the baby.” A.D. mentioned that she finds that the needs of her dog and baby are not compatible at times: “you have conflict. In the winter time, the dog wants to go out, but the baby needs to be wrapped up in a blanket, while the dog’s outside can’t make up her mind where to do it.”

However, dogs can also indirectly affect the parents in a negative manner, due to cultural norms (e.g., in Canada dogs are not allowed next to play-areas). This could negatively disrupt the whole family, as J.C. suggested:

The only negative we have now is with the kids . There are so few areas where you can have dogs and kids together. So I can’t take the dog and the kids to the park, because they are not allowed near anywhere close to a play structure. If we go to the water, the dogs can’t be there.

Another stressor for parents occurred when the dogs misbehaved. R.G. mentioned that certain undesirable behaviours of the dog were problematic immediately after adopting an older dog:

In the beginning it created a lot of tension in the family, because he would bark a lot. The first month he barked a lot, when we walked him he always pulled on the leash, bark at people and other dogs. Maybe that's why he was lost in the first place (laughing). He would be jumping a lot, at people, at food, it did create a lot of tension in the house.

Similarly, M.E. reported that "Sometimes they're a little irritants, people coming to the door, you always have to think about them...sometimes you're not quite in the mood, or you're rushed, they can be annoying." Moira mentioned that "the problem with them is that both of them bark at the door when someone comes to the door." Other unwanted behaviours were pulling on the leash, not coming back when off-leash, lunging at other dogs, attacking other dogs, and being destructive in the home.

Lastly, dog-related family conflicts moderated the effects of companion dogs on the family as a whole, including on parents. It was defined as conflicts between parents generated by presence of the dog. As previously discussed, the mothers were more likely to want and eventually adopt or buy a dog. The fathers were more likely to oppose getting a dog, although in the end they agreed and, in some cases, even participated in selecting the dog. However, at times the dogs were at the centre of conflicts between the parents. These conflicts usually involved differences in opinions regarding how to train the dog, what limits and rules the dog should follow, and in some cases, differences related to the preferential treatment of pre-existent dogs.

For example, J.C.'s husband was displeased with the amount of work involved in caring for the dogs. This situation was created by the fact that J.C. was involved in breeding, training, and fostering dogs. According to J.C., her husband "says I used to like dogs until I met you, 'cause we had so many dogs through the house, and they destroy things, and they, you know, the mess." For Moira and her husband, the conflicts were both interpersonal and directed toward the dogs. Her husband's dog, Fido1, was an older dog who was in the home before Moira's dog, Fido2. Numerous conflicts existed between Moira and her husband related to the different treatment of the dogs: "He's quite the opposite, I am not quite as affectionate to Fido1, or I am more objective with Fido1, and more subjective with Fido2." Further, Moira accused her husband of purposefully avoiding walking Fido2:

He doesn't take Fido2 as much. I find this a bit of a bone of contention, because he lets Fido1 get away with things, whereas I wouldn't let her get away, and I let Fido2 get away with things he wouldn't. So sometimes, umm, firm conversations arise about dogs' behaviours.

Effects of companion dogs on families. Although typically the dogs influenced each family member depending on their match, the dogs also affected the whole family by enhancing parent-child and sibling relationships, as well as by providing a common ground for all family members. For example, A.I. mentioned that the presence of the dog made the family stay home more, pick up activities that they can do together, and provided them with more family time during the daily walks:

I think it's brought us closer together, it's kept us home, made us more active together as a family, and we find activities that include the dog. So we picked up

geocaching, that is one family activity that we can do, the kids enjoy and we can bring the kids with us.

R.G. also suggested that presence of the dog strengthened her relationship with her son by providing them with a common topic and with the opportunity to spend quality time together during their daily walks:

It worked quite well. I bought it before he went to grade nine. I know that grade nine is a change in life as well, especially for a boy, change a school with another, but the dog is every day after dinner we go and walk together, mostly him and me, but sometimes my husband walk together. Enables us to spend time together, to have a communication, talk about school, talk about things, what happened in his class. Otherwise, these days, if we didn't have that time set aside he would be in his room with his computer playing games and internet.

Presence of the companion dog also unified siblings, as J.O. mentioned: "they all love the dog more than each other I think; not really, but it really shows that they all love the dog." V.A. described the companion animals as the "glue" that united two families:

I think that maybe, the pets are sort of, in a way the glue, if I think about it...

because the pets are so needy of all of us. We have to feed them, we have to walk them, we have to let them in and out. I think it's been kinda the glue in the family for the 2 sets of children.

Victor also described his dog as central to the family:

So for the whole family, Fido is this node of love. Nobody disagrees on how Fido loves us, and we love it, regardless of everything else... dogs are loyal, and happy, they want to please, they're a wonderful way to ground a family, to

provide a focus that everyone loves, that supersedes our grumpiness...No matter how you feel about each other, you all come together and take care of the dogs.

Discussion

The present study focused on the experiences of 20 families, with family members varying between eight months old to 80 years old having one or more companion dogs. The objective of the present research was to identify the effects of companion dogs on these families, as well as the factors influencing these effects.

The effects of companion dogs on these families were related to the quality of the *match* of the dog's characteristics with the characteristics of the parents and children.

The Match as a Theoretical Framework

The analyses for the present study generated a concept of *match*, suggesting that the presence of companion dogs has different effects for each person, depending on the *match* between certain factors. The present research expanded on the results of existing literature by providing a wider view of the effects of companion dogs in family settings. In addition, the bond between people and their companion dogs was not found to be the determinant factor in registering benefits.

Hart and Hart (1984) suggested that the adoption of companion animals might be optimized by matching the behavioural traits of companion animals to the traits of their guardians. The present study expanded on Hart and Hart by identifying additional factors that influence this match. More recently, Woodward and Bauer (2007) implied that the bond to a companion animal depends on the fit between the personality of the respective companion animals and the needs of their guardians. The present study expanded on

Woodward and Bauer by incorporating the bond to a companion animal in a wider framework.

The match is a fluid relationship between the characteristics of a person and a companion dog. The match between them can change, positively or negatively, based on modifying one of the contributing factors. For example, prior to being married, I.B.'s characteristics matched her dog's characteristics: "For a long time Fido was my baby, and she was one of the first persons, err, one of the first beings, and I adored her. She was everything to me." However, the characteristics of I.B.'s dog changed over time, from being "an active puppy" with whom I.B. enjoyed "running for an hour, and she was good, it definitely made me more active," to being reactive to other animals "I don't know when she started becoming confrontational with the other animals." The change in dog's behaviour, and the changes in I.B.'s family status in I.B. disliking to walk with her dog "He[her husband] didn't hate doing that [walking] as much as I do. 'Cause you know, you have to get dressed in the middle of the night." Because of these fluctuations in the match between I.B.'s and her dog's characteristics, the effects related to the presence of the dog differed. Initially, the dog provided more direct social support to I.B.:

After my boyfriend and I broke up, it was my first relationship, I was really depressed. She was very helpful because I had to get up and take her out, I didn't have a choice. I had to see to her needs so this helped me to snap out of it quickly... huge responsibilities, but huge benefits.

The effects related to the presence of the dog diminished after the birth of I.B.'s daughter, "Because with my daughter's diagnosis we just don't have anything left, so she's [the dog] become almost like a chore, and we love her, but we just don't have the patience

anymore. Luckily, because she's old she doesn't require much." However, although the match between I.B. and her dog has deteriorated over time, the dog indirectly influenced I.B. through her influence on I.B.'s daughter behaviour "When we go on outings sometimes we can say 'let's go see Fido,' because she [the daughter] doesn't like coming back, she likes being outside, and she's excited to come back," and language "Like yesterday she [I.B.'s daughter] saw a picture of Fido, and my mother in law has 2 dogs, and she said the longest phrase she has ever said. She said 'It's a dog, it has ears, it's so cute, there's 3 of them.'"

In contrast, an example of a poor match was between S.J.'s husband and their companion dog. The present dog was unlike the previous ones "One of the things that we used to train that worked well with the other dogs was a can with pennies in it. That just freaks him out, totally. He's a different character- if you raise your voice to loud he gets scared, and I think his brain shuts down." Further, the present dog has a health issue, which it is presumed to affect dog's behaviour: "he has medication that goes in his eyes. I think this is why in part he is insecure. I think he doesn't see as well as he did before." In addition, the dog interacts differently with S.J.'s family members, as S.J. said: "He always runs to B. and A. [the children] and to me, he [the dog] will come and check on P. [S.J.'s husband]." Although S.J.'s husband cares for the dog according to S.J., "In the mornings he will usually put his medication in his eyes. At lunch, if I am not home at that time he is the one letting the dog out and giving more water, putting him back in the kennel," he does not interact with the dog "Very rarely he would throw a ball for him," and he does not like dog's behaviour "I think he finds him needy and that annoys him to a certain degree. And then the chewing of things, that wasn't good to have either."

In summary, the main findings were that the positive and negative effects of companion dogs, including the bond between guardians and their companion dogs, were related to the *match* between *dog characteristics* (i.e., age, breed, training, individual characteristics) and the *characteristics of their family members* (i.e., age, gender, individual characteristics and social circle for children; individual characteristics and gender for parents).

The main effects for children were that companion dogs provided them with direct and indirect social support, physical benefits, and learning about responsibility. The parents also benefited from direct and indirect social support, and physical benefits. However, there were some negative effects for parents, such as financial burden, disruptions in daily schedule, and added stressors when the companion dogs were misbehaving.

Further, children with ASD benefited more than typically developing children, after considering the quality of the *match*. Children with ASD learned about social concepts through their companion dogs (e.g., aggression to peers as a prohibited behaviour was more easily conceptualized by thinking about how the dogs are not aggressed), established faster connections with dogs than with people, and received more direct social support than children without ASD (i.e., the dogs replaced the absent social circle).

The presence of companion dogs influenced not only the children or their parents, but influenced the whole family, by increasing the family cohesiveness, by mediating family conflicts, and by increasing the quality time between parents and their children.

These effects were fluid, being moderated by parental expectations, life stages, knowledge of dog behaviour, and the location where interactions between guardians and dogs took place. These findings are discussed in more detail below.

Factors Contributing to the Effects of Dogs on Their Human Companions

Dogs characteristics and effects. Similar to previous research (e.g., Welsh, 2009), dogs were considered as family members by both children and parents. The present research added to the existent literature by providing information on the different meanings people attributed to the concept of “dogs as family members.” While the children treated the dogs as siblings, in some cases lovingly and in others more indifferently, their parents had different definitions for what a family member is. Parents’ attitudes towards the dogs were influenced by potential conflicts with their spouses concerning the dog, which reflected in a way the fact that the dogs were part of the family. Although parents had different ideas regarding the integration of their dogs in their families, all of them treated the dog as “people.”

Previous research suggested that previous life experiences are important in defining individuals’ present interactions with companion dogs (Welsh, 2009). The results of the present study suggested that in family settings, where there were at least two individuals making decisions about the companion dog, the previous experience of one family member was in most cases ignored when that experience did not fit with the present concept of dog as a family member. The readily available online information regarding dogs coupled with the numerous television shows, seem to have trumped parents’ experience obtained years ago by growing up with a family dog.

The characteristics of the dogs had a salient influence on children, confirming Filiâtre, Millot and Montagner's (1986) claim that dogs' behaviour influences children's interactions with them. As observed by Filiâtre and colleagues, older dogs were less inclined to interact with children, especially with young children. The difference in energy, children's lack of coordination, and children's desire to physically examine the dogs were some of the factors that limited this interactions with children. In contrast, relatively young dogs (i.e., between 1 and 7 years of age) were more likely to interact with the children. Unlike Filiâtre and his colleagues, however, dogs' gender did not appear to influence the nature of dogs' interaction with children.

However, the analyses of the data suggested that dogs' breed influenced their relationship with their guardians. Most of the dogs were selected by their guardians based on their genetic background, and their characteristics were reflective of that. Breeds with a higher activity level, such as Schnauzers and miniature Poodles, displayed a higher level of activity than larger breeds, such as Portuguese Water Dogs, Dobermans, and various mixes of large sized dogs. Dogs' breed was a factor in parents' decision on what dogs should be adopted. The decision was related to family needs, as well as to the individual preferences of the parent adopting the dog.

Another important characteristic of dogs was their training. Although very few dogs had formal training classes, most dogs underwent some form of dog obedience. However, with the exception of the dogs of the two dog breeders, the other dogs exhibited problematic behaviours in public places and, in few cases inside the home as well. The behaviours displayed were aggression toward other animals, anxiety and jumping behaviours in the presence of visitors inside the home, and aggression toward

people inside and outside the home. This supports the results reported by Benett and Rohlf (2007), who found similar problematic behaviours in the dogs of 413 participants. They also reported that involvement in dog training was not negatively correlated with destructive behaviours, or jumping on people, suggesting that participation in dog training classes is not a valid measure of dog behaviour. A possible explanation is that participation in obedience classes is usually limited to several sessions, which does not automatically translate in appropriate behaviours for the dogs. Perhaps a more appropriate measure of dogs' behaviour is using vignettes, in order to simulate dog's behaviour. More specifically, instead of implying dog's training, future research could use vignettes clearly describing problematic behaviour in order to objectively measure dogs' training levels.

An important finding with respect to dogs' training is related to guardians' perceptions of the behaviour of their dogs. Initially, at the beginning of the interview, the participants reported being satisfied or very satisfied with their dogs' behaviour and that they would not change anything or very little of their dogs' behaviour. However, further probing into dogs' behaviour revealed behaviours that would necessitate intervention. Again, this raises the question of whether guardians' knowledge of dog behaviour needs to be investigated by using concrete examples, as opposed to relying on self-reports of participants' potentially biased impressions.

In addition, the present study sheds more light on the relationship between training and unwanted behaviours. It seems that most guardians enrolled their dogs in training classes, or hired behavioural consultants after the occurrence of an undesired behaviour (i.e., biting, aggression, jumping on people). In contrast, guardians with

knowledge of dog behaviour were able to prevent unwanted behaviours or to correct them as they occurred.

Benett and Rohfl (2007) concluded that active involvement in dog training reduced the number of reported unwanted behaviours in dogs. However, the authors could not conclude whether the difference was due to a perception bias on the part of the guardians. In the present study, the design allowed for the investigation of this issue. Probing about dogs' unwanted behaviours by asking for examples suggested that for dog guardians with limited knowledge of dog behaviour, dog training courses or consultations decreased dogs' unwanted behaviours only in the short term. Interestingly, the guardians maintained their favorable impressions of their dog even though their dog exhibited unwanted behaviours.

Another factor related to dogs' effects on their guardians was dogs' individual characteristics. According to Gosling (2009), dogs exhibit individual characteristics that affect their behaviour. The present study supported this view - participating dogs varied in their behaviours based on individual traits. These findings contribute to the existent research, and highlight the erroneous tendency to generalize dog-related findings to dogs as a species rather than treating the dogs as individuals. In the present study even dogs from the same breed, from the same breeder, and raised in the same family behaved very differently from each other, which highlights the need for researchers to consider dogs' individual characteristics when looking at canine-human relationships.

Child characteristics and effects. The present study provided an age based cross-sectional view of the relationships between children with and without ASD and their companion dogs. Children's relationship with their companion dogs was influenced

internally by the children's individual characteristics, such as their age, gender, knowledge of dog behaviour and personality traits, and externally by children's social circle and parental involvement. Of note was that in most cases details about children's interactions with their companion dogs was obtained through parents' perspective (i.e., no direct observations of children's interactions with their dogs were made, and only 10, out of 37, children directly participated in the interviews).

The interactions of children of any age with their companion dogs were affected by both parental guidance and feedback from the animals. Interestingly, feedback from animals was more effective than parental input, especially for the children with ASD. Dogs' feedback was at times negative in nature, which either reduced the children's inappropriate behaviours or stopped the children from interacting with the animals altogether.

Similar to previous research (e.g., Kidd & Kidd, 1987) young children under the age of one year responded to the presence of their companion dogs by following them with their eyes and laughing when the dogs moved around them. Children between 18 months and 48 months tended to interact with the dogs more aggressively, regardless of their diagnosis, or lack thereof. This could be explained by the investigative nature of children at this age and by their lack of knowledge in dog behaviour. At this age, the children were not involved in the care of their companion dogs, but they were able to play with their dogs. They also recognized dogs' playful behaviours as a signal for play.

The interactions of grade school children, teenagers and adolescents varied more with their individual characteristics and the characteristics of their social life. Looking at children from birth to adolescence, children appeared to have undergone specific periods

where they enjoyed the presence of their companion dogs, followed by a period of exploration, and then by either remaining interested in their dogs or losing their interest

Concerning Wilson's (1984) biophilia hypothesis, that humans are biologically attracted to life and life-like processes, the results of the present study do not entirely support or dismiss this theory. Although the children in this study were clearly aware of the presence of their companion dogs, their interest in them or other companion animals in their homes varied. Even though younger children were attracted to their dogs and other companion animals, they appeared to be more responsive to the movement and actions of these animals, rather than having a deep connection with them. If they had a deep connection, one would expect that children's interest in animals would continue through the years, but this was not true for all of the children. After the initial interest in animals' novel features, children's interest in their companion dogs fluctuated mostly based on subjective factors.

However, the present study was able to question suggestions that children with ASD are more in tune with animals than other children or adults (e.g., Solomon, 2010). After the initial stage of investigating their companion animals, several of the children with ASD became disinterested in their companion animals. Comparing the interaction of these children with the interactions of their siblings, and considering the characteristics of the companion animals and parental influence, suggested that individual differences among the children are responsible for their interest or disinterest in companion animals.

Melson and Fogel (1996) concluded that children's frequency of play with their companion animals was similar regardless of gender. The present study expanded on the study of Melson and Fogel (1996), by providing more evidence onto how children's

interactions with their companion dogs are influenced by gender. The analyses suggested that children's play type with their companion dogs was gender-specific. Girls were much more likely to play by petting, reading, walking, dressing or engaging in parallel play with their dogs. In contrast, boys preferred to play physically with their dogs, to chase, wrestle, and play ball or other games. Given the increase in children's computer-related activities, interacting with companion animals might provide children with the minimum daily requirements for physical activities.

Children's knowledge of dog behaviour influenced their relationships with their companion dogs. Like Kidd and Kidd (1985), the present study found that children as young as three were able to understand some of their dog's behaviour (e.g., playful behaviours). Understanding dog behavior allowed children more opportunities to interact with their dogs, especially outdoors. However, it is important to note that, unlike their parents' knowledge of dog behaviour, children's knowledge of dog behaviour was mostly based on interacting with their present companion dog, and thus heavily influenced by the individual characteristics of their particular dog.

In one case, the parents reported being less successful in increasing their child's interactions with their dog relative to the child's participation in a child-oriented dog training class. Although it cannot be said that the child's increased dog knowledge obtained during the dog training class caused the improvement in dog's relationship with the child, it is important to note that child-focused education could be beneficial for improving the child-dog relationship and thereby increase the benefits for both the child and the dog.

In summary, of note was the heterogeneity in children's interest in their dogs and how they manifested this interest. Children's interest in their companion dogs varied from none to being extremely interested, for both children with and without ASD.

Another factor that influenced children's interactions with their companion dogs was children's social circle - whether they were involved in afterschool activities and how many, if any, friends they had. Children's diagnosis was related to their social circle- children with ASD tended to have a rather limited social circle and reported more voluntary and involuntary isolation relative to children without ASD. Dogs were not an inferior substitute to human interaction and children who for various reasons did not participate in extracurricular activities benefited from the presence of the dog.

Dogs were beneficial to the children through their positive feedback, especially in children's teen years. Typically developing children, in most cases, develop cognitively and psychologically at a faster rate than children with ASD, effects that are more evident during the teenage years. Further, some children with ASD reported that they were being bullied at school. While the companion dogs did not provide social support to them at school, they were able to provide social support at home. For children, having a companion dog at home represented someone to be and talk with after a difficult day. Perhaps dogs' positive and constant feedback was beneficial to children, or perhaps the children benefited from not being pressured to interact in a certain way, as they would be with people.

Several aspects of the parental influence on their children's interactions with their companion dogs merit consideration. Melson (2003) suggested that parental influence needs to be investigated when looking at children's interactions with

companion animals, because parents' attitudes shape children's relationships with others. The current findings support this view, in that the parents were actively involved in their children's interactions with their companion dogs. In particular, parents decided when their children could have a dog, they created the context in which the children interacted with their dogs, and they determined the duration and the types of interactions that were permissible. This suggests that the child-companion animal interactions need to be investigated within this larger context.

The findings of the present study also support the results of studies suggesting that children's bonds with their dogs are positively correlated with their parents' bonds (Colțea, 2008; Kidd & Kidd, 1990b). Although the methods used to inquire about children's and parents' bonds to their dog were different in this study than the two studies by Colțea (2008) and Kidd and Kidd (1990b) the results suggested that parents' attitudes towards the companion dog were mostly mirrored by the children.

The present findings also expanded on those of Melson (1990) by indicating that children's interactions with their companion dogs were independent of their parents' efforts to enhance children's relationship. While the parents modeled dog interactions, and created the required conditions for the interaction, children's attitudes toward their companion dogs were solely the decision of the children. For these families, parents' desires to favorably influence their children's behaviour toward their companion animals were unsuccessful. However, parental knowledge of dog behaviour did moderate children's interactions. More specifically, parents who were able to accurately interpret their dog's behaviour were able to create an environment more conducive to their children's interactions with their dogs, if and when the children or dogs chose to interact.

Concerning the social support provided by the companion dogs to children and adults (e.g., McNicholas & Collis, 2006) the results of the present project suggest that children benefited from direct and indirect social support, and they experienced physical benefits as well. The companion dogs provided the children with direct social support, which was similar to findings reported in previous studies (e.g., Melson, 2003). The present findings extend earlier findings in that they suggest that companion dogs also provide indirect social support and that companion dogs have different effects on children with and without ASD. Whereas social support for typically developing children and adults is provided by family and friends (Cobb, 1976), the children with ASD in this sample received social support mainly from their family and companion dogs. Compared to the children without ASD, those with ASD benefited more from the support provided by their dogs due to their lack of friends. While some of the children preferred the company of their dogs because of their adverse experiences with children at school, other children simply preferred interacting with their dogs over interacting with other people. The direct emotional support provided by the companion dogs was invaluable for children with a good *match* with their dog.

Although the children with ASD may have had difficulties understanding other people's perspectives, they were able to learn about social constructs and emotions based from the examples provided by their companion dogs. In some cases, this process was enhanced by parents.

In addition, the companion dogs also provided both children with and without ASD with physical benefits through play and walks. Although some parents encouraged their children to walk more, the children's physical interactions were largely dictated by

the children's preferences. Interacting with the dogs provided an unexpected benefit—time away from computer games, and interactions based on reciprocity and perspective taking.

Like Viau et al. (2010), who found that autism service dogs reduced children's morning stress levels, in the current research suggested the presence of companion dogs improved children's behaviour, especially in the mornings. Although children's stress levels were not measured in this project, the children and their families presumably had lower stress levels due to the improvements in the morning routine. Further, the analyses suggested that the stress reducing benefits of dogs extended to other family activities — because the children were more willing to participate in family activities when the dogs were present.

With regard to the human-animal bond theory (e.g., Crawford, 2006), children's bonds with their companion dogs varied based on the *match* between them and their companion dogs. Unlike previous research, however, the bond between children and their dogs was not influenced by parental attitudes. Although the parents enhanced certain interactions with the dogs, children's bonds were influenced mostly by the *match*.

While numerous measures of people's attachment to companion animals assess the time people spend with their companion animals and the nature of these interactions (e.g., Melson, 1990), the current results indicated that these factors did not contribute to children's relationship with their dog. In the present project, some children with and without ASD did not interact with the dogs during the day, but were adamant about having the dogs in their rooms over the night. Further, even children who were not actively involved in their dog's care and did not interact often with their dogs were

affected emotionally by the death of their dog, or by the thought that their dog could become ill.

The companion dogs were also influential in children's bond to them. Children whose dogs reciprocated their interest by playing with them and responded to their instructions had stronger bonds with their dogs. The participants in this project reported that some of the dogs were naturally attracted to some children, while disliking others. This aspect of child-dog interaction deserves further investigation.

In summary, some children with ASD enjoyed more benefits from their companion dogs than other children with and without ASD did due to their limited social circle and their lack of social interactions. Further, and especially for the children with ASD, the benefits these children experienced as a results of their interactions with their companion dogs positively affected the whole family. However, this finding did not generalize to all children.

Parent characteristics and effects. Serpell (2009) suggested that more research is needed to understand the factors influencing human-animal interactions. The present study investigated some of the characteristics of parents (i.e., gender, individual characteristics) that influenced their relationship with their companion dogs. Knowledge of dog behaviour, parents' expectations of the dogs, and family stages moderated their relationship with the companion dogs.

In the families participating in this study, women were more likely than men to initiate the process of adopting or buying a dog. Dog caregiving tasks, however, were divided between the parents based on their competencies. Similar to what was observed on children, there was a gender difference in parents' type of play with the dog. The

participant mothers were concerned for their children, because their male partners' physical type of play might affect how the dogs played with the children. Although this aspect was not pursued in the present study, there was no evidence that parents' type of play actually influenced how the dogs played with the children.

No gender difference was registered regarding walking the dogs, except for families where walking was a chore. Similar to Cutt, Giles-Corti and Knuiman (2007), who concluded that dogs' characteristics influenced how much their guardians walked with them, in the present study walking was perceived as a chore by parents with noncompliant or aggressive dogs. In these cases, men tended to be responsible for walking the dogs because of their ability to physically restrain the dogs. In addition, the family status also influenced the frequency of dogs' walks in that some families with young children perceived walking the dogs as more of a chore.

Like the children, there was also a gender difference in parents' talking to dogs with women reporting more verbal interactions with their dogs. Both women and men, however, tended to use baby-talk when addressing their dogs affectionately or playfully. Individual traits also contributed to talking, as well as family stages. Participants who were more extroverted were more likely to engage in baby talk with their dogs and women interacted more with the dogs before the arrival of children, and overall they talked and interacted more with the dogs than men were. While this might suggest that women had better relationships with their dogs, time availability may be responsible for this gender difference in that in all but one case, women spent more time at home than men did. Further, the men were more likely to prioritize their limited free time for their young children than for their dogs.

Another factor that influenced parents' relationship with their dogs was their knowledge of dog behaviour and their memories of their previous dogs. Although previous studies relied on how long guardians have had dogs as a measure of their dog behaviour knowledge (e.g., Mondelli et al., 2004), in the present study previous exposure to dogs did not automatically transfer into knowledge about dog behaviour. Although some participants grew up with dogs, and/or had dogs of their own prior to the present dog(s), they did not necessarily have a good understanding of dog behaviour.

Alternatively, Mondelli and colleagues (2004) suggested that dog guardians had rigid expectations about how dogs should act and newly adopted dogs that did not conform to those expectations were returned to the shelter. The findings of the present study partially support this alternative explanation. Dog guardians with previous exposure to dogs compared their present dogs to their previous dogs, suggesting that they had a certain image of a dog. Hence, the present dogs may have dissatisfied guardians who idealized their experiences with their previous dogs rather than considering the individuality of each dog.

Concerning knowledge of dog behaviour, it became apparent that there was a discrepancy between the claimed knowledge of dog behaviour and the actual knowledge. This translated into misguided expectations of the dogs and reduced satisfaction with the dogs. Further, investigating solely the length of one's relationship with a companion dog is not a reliable indicator of knowledge of dog behaviour. Some of the participants in the present study had long relationships with their dogs, but this did not mean that their knowledge of dog behaviour increased, but rather that they became accustomed to the behaviours of their dogs.

Further, in families with older dogs, it became apparent that the welfare of dogs decreases with age, especially in families with young children. Although this topic was not part of the present research, it deserves further research.

Participants reported good relationships with their dogs, but these were moderated by the place where their interactions took place, and by parents' expectations. While most participants were satisfied with their dogs, further investigations revealed that for all but one participant, satisfaction was closely related to whether the interactions between parents and dogs were inside or outside their homes. In general, dogs were much more likely to misbehave outside their homes, which led to a decrease of participants' satisfaction with their dogs, and a reduction in time spent outdoors. This is an important finding for studies investigating benefits associated with dog walking. Comparing the well-being of groups of dog guardians who walk with their dogs versus who do not walk with their dogs is confounded by factors such as dog behaviour, location of the interactions between dogs and their guardians, as well as by presence of children.

Parents' expectations for their dogs appeared very influential in their relationships. Participants with unrealistic expectations from their dogs registered few benefits, unless they modified their expectations after becoming more knowledgeable in dog behaviour. In contrast, participants with a strong knowledge of dog behaviour, and participants who had realistic expectations from their dogs, enjoyed more benefits.

Similar to previous research (Albert & Bulcroft, 1988), a last factor that moderated the benefits registered by participants from the presence of companion dogs was their family stages (i.e., single, no children, young children, teenage children). Changes in family structure involved changes in the relationship between dogs and their

guardians. The interviews for this study covered the interactions between dogs and participants for the period when the participants were single, not being in a relationship. Participants, especially women who had their dogs prior to being in a relationship, reported enjoying a much closer relationship with them. Families without children benefited by interacting more with the dog, by being more involved emotionally with the dog, by being more physically active with the dog, and by expanding their social circle through interactions with people who had a similar interest. In contrast, parents of young children with a limited knowledge of dog behaviour experienced difficulties in taking care of the dog during their child's early years. Further, single parents with little knowledge of dog behaviour having young children experienced even more difficulties, especially due to time constraints, and social norms. Because of norms prohibiting the presence of dogs close to playgrounds, and a lack of child play structures at dog parks, parents had a difficult time in providing good care to both children and dogs. In addition, another similarity with the study of Albert and Bulcroft was that, in general, participants reported that the reason for adopting a dog after having children was that dogs help children learn about responsibility by caring for dogs.

The above factors influenced the social support offered by companion dogs to parents. Similarly to previous research (e.g., Becker & Kushner, 2006), the companion dogs provided parents with direct social support- companionship, someone to talk to, relief from busy schedules, relaxation through games, as well as emotional support through their unconditional love. However, the *match* between the characteristics of parents and dogs moderated these benefits.

A notable difference was that parents, especially parents of children with ASD, were prioritizing their children's relationships with the dog. In consequence, some of these parents experienced more benefits than expected based on their own relationship with the dog, due to the added satisfaction related to the benefits generated by children's *match* with the dog. Importantly, the presence of the companion dogs provided parents of children with ASD with more information about the emotional states of their children, which would have been otherwise unknown to them. The research method for the present project was best suited to understand the experiences of the participants. More specifically, the face-to-face interviews allowed the participants to describe the emotional benefits they registered based on their children's interactions with their companion dogs, and how these interactions were beneficial to the children.

An aftereffect of these results is that in order to fully understand the effect of presence of companion dogs on adults living in a family setting with children, future research should account for the influence of children's relationship with the dog on parents.

In addition, the analyses of the present study suggested that caring for a dog provided couples with parenting skills. Parents of children with ASD reported the beneficial effect of becoming used to routines and to understanding behaviour by observing the context, by learning about responsibilities and by becoming accustomed to plan family activities ahead of time.

Similar to children, parents' bond to their companion dogs was based on their *match* with the companion dogs. This emotional bond was present from the beginning for some parents, for some it developed over time, and for some it never developed.

However, absence of an emotional bond did not affect taking care for the dog. The initial bonding was based on parents' expectations, their knowledge of dog behaviour, and their individual characteristics. Following the initial emotional attachment, the bond developed or regressed based on the *match* between parent's characteristics with dog's characteristics. A good *match* resulted in a constant bond, if the bond was strong initially, or an increased bond if the initial bond was not strong. Parents experienced a lesser bond with their dogs when they maintained unrealistic expectations from their dogs based on a limited knowledge of dog behaviour. However, adjusting one's expectations based on acquired knowledge of dog behaviour resulted in an increased bond with the dog.

In addition, parents also registered physical benefits. While the children experienced these effects separately from their parents' interactions (i.e., good *match* between parents and dog did not affect a bad *match* between child and dog), parents benefited from a good match between their child(ren) and their companion dogs. Interestingly, parents' initially reported satisfaction with the dogs was related to an overall impression of the dogs, not to their direct relationship. Perhaps in a family setting parents do not think of their immediate benefits first.

The physical benefits related to the presence of companion dogs were related to dogs' and parents' characteristics. Parents who valued physical activity were more likely to adopt a presumably active dog. The analyses of the present research indicate that walking with the companion dog was related closely to these characteristics. In other words, parents did not become more active just because of the dog. In most cases the dogs were not walked, especially in families with very young children. Further, while

managing the challenges of a new child, parents reduced their interactions with the dog, especially their outdoors interactions, such as walks or trips to off-leash parks.

However, companion dogs were at times added stressors for families of children with and without ASD. Similar to previous research (e.g., Benett & Rohfl, 2007), parents reported dissatisfaction with their companion dogs when they misbehaved. Of note was that while the parents acknowledged in most cases that their companion dogs have ‘inappropriate’ behaviours, the *match* between them moderated these negative effects. Knowledge of dog behaviour provided the parents with methods to alleviate these unwanted behaviours. Parents with limited knowledge of dog behaviour, but with a good match, ignored these behaviours, or minimized them by avoiding the contexts in which these issues occurred. In contrast, these behaviours were aggravated by parents without a good *match* with their dogs. In addition, presence of companion dogs sometimes was a source of conflict between the two parents. The conflicts were generated by differences of opinion on dog behaviour, or due to perceived differential treatment if there were more than one dog in the family. These conflicts were moderated when both parents were knowledgeable of dog behaviour.

Lastly, of note was the effect of the companion dogs at the family level. Although each family member had individual relationships with the companion dogs, the presence of dogs enhanced parent-child relationship as well as the relationships between siblings. While the dogs affected each family member at an individual level, their presence also influenced the whole family. The dogs provided a focus for the whole family, a source of relaxation for some, as well as a way to bring together family members who otherwise would not have had common interests. In addition, companion

dogs provided continuity for children in divorced families, who had to travel between two homes on a regular basis. In conclusion, the companion dogs in families with and without ASD influenced the children, their parents, and the family as a whole.

Limitations of Present Research

Several factors might have influenced the development of this theory. The participants were in most cases self-selected. Certain personality types might have been reluctant to talk about their lives details with the researcher. It is important to note that more research on different samples is needed before generalizing this theory and factors. Further, more fieldwork in this area could be beneficial. Lastly, given the nature of this study, it is expected that other researchers might have different interpretations of the data.

Implications of Present Research

Using face-to-face interviews allowed me to obtain richer information from the participants than using questionnaires. Unlike questionnaires, the conversation between participants and researcher revealed many details about the interactions between families with children with and without ASD and their companion dogs. Of note was parents' of children with ASD recollection of the effects of dogs on their children, more specifically the fact that children displayed emotions that they otherwise would not display with people.

Using the Grounded Theory method provided a unique perspective on the human-canine interactions in families of children with and without ASD, through the ability to investigate the numerous topics raised by participants.

The effects of the presence of companion dogs on the humans in this sample were not universally positive and many factors influenced the outcomes. While much of

the previous research has applied a 'one-size fits all' approach to human-animal research, the present findings suggest that such an approach cannot accurately reveal the intricacies of human-canine interactions. Future researchers should approach human-animal interactions with an awareness of the uniqueness of each relationship. Participant expectations, knowledge of dog behaviour, social circle, their family stage, memories of previous companion dogs, as well as dog characteristics are some of the factors that need to be considered. Another factor that could be considered by future researchers is the way parents prepare children for their dogs' death and whether this factor might contribute to not having companion dogs.

The individual traits of children and teenagers in the present study moderated their interactions with their companion dogs and other animals in the household. Therefore, not all children interacted consistently with their companion dogs. On the surface, parents reported that their children interacted more or less with their dogs. Nonetheless, children's benefits are not related to the time spent with a companion animal or the frequency of interactions. Some children, mostly children with ASD, preferred to observe their companion dogs without physically interacting with them. Regardless, they were as likely to be aware of their dogs and to be as emotionally involved with them as were children actively interacting with dogs. This finding suggests that contextual information is needed when using questionnaires designed to investigate children's involvement with their companion dogs. Simply inquiring whether the child interacts with a companion dog is insufficient for inferring the nature of a child's relationship with their companion dog. Further, this finding highlights the need to

reconsider the relation between time spent with a companion animal and children's bond to the respective animal.

The present findings support the suggestion by Melson (2003) that children's interactions with animals should be investigated in a larger context. Although parents were not the primary factor influencing children's interactions with their companion dogs in the present sample, the parents were the ones creating the environment in which the children interacted with the dogs. Therefore, it is important for future researchers to understand whether these interactions are fully encouraged by the parents or not, in order to fully understand children's relationships with their companion dogs. Although the present study provided more insight into these issues, future research is needed to better understand parent's roles and other moderating factors.

The findings of this research provide evidence of the role of companion dogs as social support. In this sample, the dogs provided both direct and indirect social support to children with and without ASD, as well as to these children's parents. While the role of dogs as providers of direct social support has been investigated in previous studies (e.g., Walsh, 2009), few studies have examined the role of companion dogs as an indirect social support for typically developing populations (e.g., Wells, 2004). Moreover, the present study is the first to provide evidence that companion dogs can provide indirect social support to children with ASD.

Although the present research investigated companion dogs, the importance of *match* is potentially relevant for working dogs. It is likely that the effects of therapy dogs, or assistance dogs involved in diverse activities (e.g., play therapy, counseling) also vary depending on the *match* between the respective dogs and people. For adequate

understanding, research on the effects of therapy dogs should consider factors that may influence the match, such as client's expectations and preferences, as well as dog characteristics. In addition, this theoretical model could be tested against other companion animals. For example, in the present study the model appeared to apply to children's interactions with cats.

The analyses of this research suggested several practical applications for families with a companion dog. First, given that participants' expectations of their companion dogs were influenced by their knowledge of dog behaviour, a more in-depth understanding of dog behaviour would promote a better match. To facilitate this during the adoption process, flyers containing information and links to online resources could be distributed at local shelters, by breeders, and in pet stores. While parents do guide children's interactions with the companion dogs, additional information about dog behaviour from other sources would be beneficial, especially given that sometimes parents misunderstand dog behaviour. Increasing parent knowledge of dog behaviour would enhance their understanding of the physical, social and emotional needs of their companion dogs. Finally, increased parental knowledge of dog behaviour would also improve their children's interactions with the dog by, for example, creating an environment conducive of positive interactions between child and dog. Children's knowledge of dog behaviour could also be improved either before or after adoption by their participation in obedience classes

In view of the observed relevance of dog characteristics, parents need to be better informed about breed characteristics, as well as the individual characteristics (personality) of their dog. Parents in this sample expressed concerns about size and coat

characteristics, but few emphasized the need to investigate personality characteristics when adopting a dog. Understanding the different personality traits in dogs could prevent unrealistic expectations of dogs and, in turn, influence the effects of dogs on people.

Informing parents of children with ASD about the potential benefits of having a companion dog has the potential to change the well-being of these families in a positive way. Companion dogs have an important role in families of children with ASD by providing direct support (e.g., companionship) and especially indirect social support (i.e., facilitating interactions with others) to both children and parents. Although providing more opportunities for children and dogs to interact both inside and outside the home could conceivably increase opportunities for indirect social support for both children and their parents, further research is needed to develop guidelines for how this can be accomplished, especially with regard to the latter. Creating recreational spaces that allow both children and dogs to interact would provide parents with more opportunities for indirect social support. For example, currently in Canada, dogs are not allowed near playground structures.

Conclusion

The present study provided a new perspective of human-canine interactions within a family context. This study provided evidence for a model of human-animal interactions based on the *match* between the characteristics of people and their companion dogs. This finding adds to the growing evidence that human-animal interactions are not based on a general template, but rather that each relationship is unique to a certain degree.

The presence of companion dogs was related to a series of effects for children and parents, such as direct and indirect social support, physical benefits, and learning about responsibility for children. To a lesser degree, the presence of dogs was also related to negative effects for parents (added stressors when misbehaving, disrupted family schedules, and financial burden).

In a family setting, the effects of companion dogs on family members are interrelated. The effects on children are influenced by parental guidelines, and the effects on parents are influenced by the child's relationship with the dog. This contrasts with previous research in this literature, which has focused on children or adults and not as much on the family as a whole.

Further, the results of the present study suggested that the presence of companion dogs could affect the whole family. Companion dogs could provide families with a focal point. In addition, companion dogs could provide common activities for parents and children, such as walking, increasing the communication between family members.

Lastly, this study is the first to compare the effects of companion dogs on both families with and without children with ASD. Comparative to families with typically developing children, families of children with ASD may benefit more from the presence of their companion dogs because of the effects of these disorders. Children with ASD registered more direct social support (e.g., companionship, replacement of human friends), and the indirect social support was more beneficial to children with ASD due to their limited, and in some cases nonexistent, prior to having the dogs, interactions with others. In addition, the presence of dogs was related to a decrease in noncompliance on the part of children with ASD (e.g., children were more willing to engage in activities if

the dog was present). Further, parents in these families benefited indirectly from the effects on children and the companion dogs allowed parents to observe new facets of their children (e.g., positive emotions). In addition, the increase in child compliance due to the presence of the dogs enhanced parents' well-being.

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List of Tables

Table 1

Characteristics of the Companion Dogs

Participant	Dogs number	Age	Gender	Dog breed	Dog traits
V.A	1	6	M	Schnauzer x Poodle	Hyper
I.B	1	12	F	Collie x Sheppard	Smart/Neurotic
J. C	1	8	F	Doberman	Pretty/Obedient
A.D	1	4	F	Bichon Havanais	Placid/Gentle
M.E	2	6	M	Miniature poodle	Hyper/Smart
		6	M	Miniature poodle	Cuddly/Stupider
Moirá	2	10	F	Schnauzer	Diva
		2	M	Boxer	Energetic/Sociable
Cujo/ Marvin	1	7	M	Dachshund	Happy/Affectionate
R.G/D.G	1	4	M	Jack Russell	Active/Smart
A.I/P.I	1	5	M	Boston terrier	Special needs/Gentle
S.J	1	3	M	Mix	Affectionate
K.K	1	1.5	M	Labrador	Docile/Smart
Victor	1	11	F	Border collie x	Serene/Smart
Beth	3	1	M	Mix	NA
		4	F	Mix	NA
		11	F	Border collie x	Affectionate
C.N	2	6	M	Portuguese water dog	Smart
		3	F	Portuguese water dog	Sweet
C.M/J.M	1	1.5	F	Poodle x Chihuahua	Very shy/Cuddly
J.O/M.O	1	8	M	Beagle x Jack Russell terrier	Good with kids
Lynn	1	5	F	Chesapeake bay retriever	Not smart/Cute
Lee/Alan	1	2	M	Labradoodle	Warm/Ball obsessed
P.Q	2	9	M	Brittany's	Hyper/Aggressive
		8	F	Brittany's	Princess/Cuddly
Sophia	3	2	M	Beagle x Jack Russell	Cute
		5	M	Husky x Shepherd	Friendly
		6	F	Beagle x Jack Russell	Aggressive

Table 2

Characteristics of the Children With and Without Autism Spectrum Disorders

Participant	Number of children	Age	Gender	Diagnosis	Child activity with dog
V.A.	3	18	M	Asperger's	Walk
		NA		None	Play
		NA		None	Play
I.B.	1	3	F	PDDNOS	Play
J. C.	2	5	M	Asperger's	None
		1	F	None	Play
A.D.	3	14	M	None	None
		9	M	Autism	None
		1	F	None	Play
M.E.	3	20	F	Asperger's	Care/Walk
		14	F	None	Care/Play
		NA	M	None	Play
Moirá	2	12	M	Asperger's	Play/Care
		NA	F	NA	Play/Care
Cujo/ Marvin	1	4	F	None	Play
R.G./D.G.	3	14	M	None	Walk/Play/Care
		NA	F	None	None
		NA	F	None	None
A.I. /P.I.	2	11	F	Asperger's	Care/Play/Walk
		9	F	None	Play
S.J.	2	13	F	None	Care/Play
		NA	M	None	Care/play
K.K.	1	9	F	None	Walk/Play/Care
Victor	1	18	F	PDDNOS	Care
Beth	1	18	F	PDDNOS	Care
C.N.	1	21m.	M	None	Play
		9	F	None	Care/Play
C.M. /J.M.	3	NA	F	None	Play
		NA	F	None	Play
		17	M	Asperger's, ADHD	Care/Walk/Play
J.O. /M.O.	3	NA	M	None	Care/Play
		NA	F	None	Care/Play
Lynn	2	9	M	Asp	None
		7	M	None	None
Lee/Alan	2	10	M	Asp	Care/Walk/Play
		6	M	None	Play
P.Q.	2	11	M	Autism, ADHD	Play
		13	M	None	Care/Play
Sophia	2	12	M	Autism	Walk/Play
		15	M	Other	Play

Table 3

Characteristics of the Parents

Participant	Age	Gender	Ethnicity	Marital status	Education	Parent activity with dog
V.A.	48	F	White	Married	Univ.	Play/Care
I.B.	33	F	White	Married	P.G.	Care
J. C.	36	F	White	Married	Univ.	Walk/Care/Training
A.D.	NA	F	White	Married	Coll.	None
M.E.	51	F	White	Married	Univ.	Care/Play
Moira	39	F	White	Married	Univ.	Walk/Care/Play
Cujo/ Marvin	34/41	F/M	White	Married	Univ./P.G.	Play/Care
R.G. /D.G.	44/49	F	Asian	Married	P.G./P.G.	Walk/Play/Care
A.I. /P.I.	30/NA	F/M	White	Married	H.S./Coll.	Walk/Care/Play
S.J.	44	F	White	Married	Coll./H.S.	Walk/Care
K.K.	24	F	White	Married	Univ.	Walk/Play/Care
Victor	NA	M	White	Divorced	P.G.	Care
Beth	52	F	White	Married	Univ.	Walk/Care
C.N.	32	F	White	Married	Coll.	Walk/Care/Training
C.M. /J.M.	NA	F/M	Caribbean	Married	Coll.	Care
J.O. /M.O.	45/48	F/M	White	Married	Univ./P.G.	Walk/Care
Lynn	38	F	White	Divorced	Coll.	Walk/Care
Lee/Alan	45/47	F/M	White	Married	Univ./Coll.	Walk/Care/Play
P.Q.	37	F	White	Married	Coll.	Care
Sophia	44	F	White	Married	Univ.	Care/Walk/Play

Note: P.G. = Post graduate studies, Univ. = University, Coll. = College.

Table 4

Summary of Findings

Participants	Dog characteristics	Child characteristics	Parent characteristics	Match
	Age Training Inside/Outside Individual traits	Age Individual traits Social Circle Diagnosis	Individual traits Dog knowledge Family Conflicts Expectations	Child Parent
V.A.	6 No/Some Hyper	18/Calm-Dog Uninterested V.Small/Asperger's NA/Busy-Dog Interested/Large/None NA/Busy-Dog Interested/Large/None	Busy Some No Fulfilled	Child: Some Child: Some Child: Some Mother: Yes Father: Yes
I.B.	12 Yes/No Smart, Neurotic	3 Curious-Dog Interested Small PDD-NOS	Tired Some + Some Somewhat fulfilled	Child: Some Mother: Some Father: Some
J. C.	8 Yes/Yes Pretty, Obedient	5/Active-Dog Uninterested/Small/Asperger's 1/Playful-Dog Interested./Small/None	Busy Yes Yes Somewhat fulfilled	Child: Some Child: Some Mother: Some Father: No

A.D.	4 Yes/Some Placid	14/Active-Dog Uninterested/Large/None 9/Very Active-Dog Uninterested/Small/Autism 1/Calm-Dog Interested/Small/None 20/Shy-Dog Interested/Very Small/Asperger's	Maternal Some No Not fulfilled	Child: Some Child: No Mother: Some Father: Some
M.E.	6/Some-Some/Hyper, Smart 6/Some-Some/Cuddly, Stupider	14/Active-Dog Interested/Large/None NA/Active-Dog Interested/Large/None	Busy Some + No Fulfilled	Child: Yes Child: Yes Child: Some Mother: Yes Father: Yes
Moirá	10/Some-Yes/Diva 2/Some-Some/Energetic, Sociable	12/Active-Dog Interested/Small/Asperger's NA/NA/NA/None	Maternal Some Yes Fulfilled	Child: Yes Child: Yes Mother: Yes Father: Yes
Cujo	7/Yes-No/Happy, Affectionate	4 Active-Dog Interested Small None	Maternal Some No Yes	Child: Some Mother: Yes Father: Yes
R.G.	4/Some-Some/Active, Smart	14/Active-Dog Interested/Very Small/None NA/Dog Uninterested/Large/None NA/Dog Uninterested/Large/None	Relaxed Some + No Yes	Child: Yes Child: No Child: No Mother: Yes Father: Yes
A.I.	5 Yes/Some Special needs, Gentle	11/Gentle-Dog Interested/Very Small/Asperger's 9/Busy-Dog Uninterested./Large/None	Concerned Some No Somewhat	Child: Yes Child: Some Mother: Some Father: Yes

S.J.	3 Yes/Some Affectionate	13/Gentle-Dog Interested./Small/None NA/Playful-Dog Interested./Small/None	Methodical Yes No No	Child: Yes Child: Yes Mother: No Father: No
K.K.	1.5 Yes/Yes Docile, Smart	9/Active-Dog Interested./Large/None	Maternal Some No Yes	Child: Yes Mother: Yes Father: Yes
Victor	11 Yes/Some Serene, Smart	18/Calm-Int./Very Small/PDDNOS	Reflexive Some Some Some	Child: Some Father: Some
Beth	1/Some-Some/NA 4/Some-Some/NA 11/Yes-Some/Affectionate	18/ Calm-Dog Interested/Very Small/PDDNOS	Busy Some Yes Some	Child: Some Mother: Some
C.N.	6/Yes-Yes/Smart 3/Yes-Yes/Sweet	21m. Active-Dog Interested Very Small None	Methodical Yes Yes Yes	Child: Some Mother: Yes Father: Some
C.M.	1.5 Some/No Very shy, Cuddly	9/Shy-Dog Interested/Small/None NA/Playful-Dog Interested/Large/None NA/Playful-Dog Interested/Large/None	Busy None None None	Child: Yes Child: Yes Child: Yes Mother: Some Father: Some

J.O.	8 Yes/Some Good with kids	17/Shy-Dog Interested./Very Small/Asperger's, ADHD NA/NA-Dog Interested/NA/None NA/NA-Dog Interested/NA/None	Relaxed Some No Yes	Child: Yes Child: Some Child: Some Mother: Yes Father: Yes
Lynn	5 Some/Some Not smart, Cute	9/Calm-Dog Uninterested/Small/Asperger's 7/Calm-Dog Uninterested/Small/None	Exigent Some No No	Child: No Child: No Mother: No
Lee	2 Yes/Some Friendly, Ball obsessed	10/Calm-Dog Interested/Very Small/Asperger's 6/Pestering-Dog Interested/Small/None	Maternal Some No Some	Child: Yes Child: No Mother: Some Father: Yes
P.Q.	9/Some-No/Hyper-Aggressive 8/Some-No/Princess-Cuddly	11/Calm-Dog Interested/Small/Autism, ADHD 13/Calm-Dog Interested/Large/None	Autism, ADHD None	Child: Some Child: Some Mother: Yes Father: No
Sophia	2/Some-No/Cute 5/Some-Some/Friendly 6/Some-No/Aggressive	12/Calm-Dog Interested/Very Small/Autism 15/Active-Dog Interested/Very Small/Other	Busy Some No Yes	Child: Yes Child: Yes Mother: Yes Father: Some

Figure 1. Theoretical model of the effects of companion dogs on families of children with and without ASD.

Appendix A

Background questionnaire

This questionnaire should be completed by the parent who spends the most time with the participating child. The questions are about your child, you, your family, and your companion dog(s).

1. Please choose a pseudonym:

Child:

Mother:

Father

2. Age:

Child:

Mother:

Father:

3. Child's gender:

☐ Female

☐ Male

4. Child's ethnicity:

☐ First Nations, Métis, or Inuit

☐ White

☐ African

☐ Caribbean

☐ South-Asian

☐ East-Asian

☐ West-Asian

☐ Latin-American

☐ Arab

Other (please specify) _____

Please mention whether your ethnicity is different.

☐ NO

☐ Yes. Please specify _____

5. Marital Status:

- ☐ Married/common-law
- ☐ Single, never married
- ☐ Single, separated/divorced
- ☐ Single/widowed

6. Highest completed education level (e.g., grade/high school, college, university, post-graduate):

Child:

Mother:

Father:

7. Occupation:

Mother:

Father:

8. Child diagnosis and treatment (if any):

Diagnosis:

Treatment:

9. Companion dogs:

How many dogs are present in the home?

Age:

Sex:

Breed:

When did the dog(s) come to your home?

Appendix B

First Interview Guide

Go over the informed consent procedure!

Dog questions

- What is the most striking characteristic of the dog
 - Could you tell me a bit about your dog, what comes to your mind first?

Child-related questions

- Could you describe how the dog fits in a typical day of your child's life?
- How would you characterize the relationship between your child and the dog?
- When did your child start to interact with the dog?
- How has having the dog affected your child?
 - their activities?
 - their well-being?
 - Physically, emotionally, socially, language.
 - Positive aspects, Negative aspects (Examples)

Parent-related questions

- Could you describe how the dog fits in a typical day of your life?
- How has having the dog affected you?
 - your activities?
 - your well-being?
 - Physically, emotionally, socially, language.
 - Positive aspects, Negative aspects (Examples)

Partner-related questions

- Could you describe how the dog fits in a typical day of your life?
- How has having the dog affected your partner?
 - their activities?
 - their well-being?
 - Physically, emotionally, socially, language.
 - Positive aspects, Negative aspects (Examples)

Closing

- Is there anything else you think I should know about how having this dog has affected your family?
- Do you have any questions or comments about the interview?

Debriefing – review verbally and give written copy

Appendix C**Post Interview Form**

Interview Date:

Interview Location:

Duration:

Summary of findings requested: Yes No

IF YES, Address/email to be sent to

Interview features:

- *emotional tone of interview*
- comfort level of participant and interviewer
- participant openness

Other notable features/comments:

Appendix D

Informed Consent

The purpose of an informed consent is to ensure that you understand the purpose of the study and the nature of your involvement. The informed consent has to provide sufficient information such that you have the opportunity to determine whether you wish to participate in the study. Please ask the researcher to clarify any questions you may have.

This study is being conducted by Cosmin Colțea, under the supervision of Dr. Shelley Parlow, as part of the requirements for the Masters of Arts program in the Department of Psychology at Carleton University. If you agree to participate, you will be asked to participate in a 60-90 minute interview focusing on the relationship between your child with autism or related spectrum disorders and the companion dog. In addition, you will be asked about your partner's relationship, and your relationship, with the companion dog.

Please be aware that your participation is voluntary, and you have the right to not answer specific questions, or to terminate the interview at any time for any reasons without penalty. Any responses you provide will be kept confidential. With your consent, the interviews will be tape recorded, to ensure the accuracy of transcribing them. The identity of the participants will be protected by using pseudonyms. Anything linking your name to the research materials will be stored in a locked filing cabinet accessible only to my supervisor and myself, and will be destroyed upon completion of the project.

If you require any additional information about this study, please feel free to contact Cosmin Colțea at ccoltea@connect.carleton.ca, or Dr. Shelley Parlow at sparlow@connect.carleton.ca. If you have any ethical concerns regarding the study, you can contact Dr. Monique Sénéchal (Chair of the Carleton University Ethics Committee

for Psychological Research) at (613) 520-2600, ext. 1155. If you have any other questions about this study, please feel free to contact Dr. Janet Mantler (Chair of the Department of Psychology, Carleton University) at (613) 520-2600, ext. 4173.

My signature below indicates that I have read the above statement and freely consent to participate in this study.

Participant's Name: _____

Participant's Signature: _____ Date : _____

Consent for Follow-Up Contact

I hereby grant the researcher, Cosmin Colțea, permission to contact me at a later time to follow up on this interview. I understand that the purpose of this follow-up call is to ensure accuracy and completeness, as well as feedback on the emerging theory.

Participant's Name: _____

Preferred Contact Number : _____

Participant's Signature: _____ Date : _____

Consent for Audiotaping

I hereby consent to the audio recording of this interview. I understand that it is being audio taped for accuracy purposes only, and that the recording will be destroyed upon completion of the study.

Participant's Name: _____

Participant's Signature: _____ Date : _____