

**Okanagan CHILD-CANINE BONDING IN CHILDREN WITH ASD: FINDINGS
WITHIN AND ACROSS CASE STUDIES**

by

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ABSTRACT

The demand for support for children and families impacted by Autism Spectrum Disorder (ASD) continues to grow, and one increasingly popular avenue of support is the use of therapeutic canines. Parents searching for service canines trained to work with children with ASD however face formidable obstacles surrounding the availability and cost of canines. Due to these challenges, parents may seek less formal routes to support their children with ASD, often adding companion canines to their family. Despite enthusiasm for integrating companion canines into the care plan, research examining human-animal bonding in children with ASD and the mechanisms through which child-canine bonding occurs in this population is needed. Furthermore, research identifying factors that influence children on the spectrum's ability to bond with a companion canine is meagre. Given the nuanced interactions that exist to indicate the presence or absence of bonding (e.g., proximity, initiations of interactions and touch), this exploratory case study employed interviews and observations to gain insights into the mechanisms or pathways through which child-canine bonding occurs and to identify factors contributing to this bonding process. Families ($N=6$), with a child aged 5-14 years with a confirmed diagnosis of ASD and their family canine, participated in the study. Using the components of attachment theory (i.e., safe haven, secure base, proximity seeking, and separation anxiety) as a framework to categorize thematic responses, directed content analysis was used to identify whether the child-canine relationship could be conceptualized as an attachment relationship. Conventional content analysis was used to identify key themes characterizing child-canine bonding arising in interviews and observations and later verified by field notes. Findings revealed support for the use of Bowlby's theory to understanding child-canine bonding with *proximity maintenance* identified as the most prevalent component followed

by *secure base*, *safe haven*, and *separation anxiety*. A cross-case analysis revealed seven prevalent themes characterizing child-canine bonding. The themes that were identified included: 1) *Canine Acquisition*; 2) *Bonding Strategies*; 3) *Canine Characteristics*; 4) *Canine as Family Member*; 5) *Family Profile*; 6) *Benefits*; and 7) *Other*. Theoretical and applied implications of these findings are addressed.

PREFACE

This research was approved by the UBC Okanagan Behavioural Research Ethics Board on September 2, 2015. Ethics certification #H15-01479.

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CHAPTER 1 – INTRODUCTION

1.1 Background and Context

Parents of children with autism face unique challenges as they raise their children within busy social contexts. Children with exceptionalities often face obstacles that can be alienating as they try to fit into complex social structures and systems (Home, 2002). The global prevalence of autism has increased twenty to thirtyfold over the past 4 decades and is now the most common neurological disorder affecting children (current figures are 1 in every 68 children are diagnosed; Center for Disease Control and Prevention, 2014). Autism spectrum disorder (ASD) is a lifelong developmental disability defined by criteria in *The Diagnostic and Statistical Manual of Mental Disorders: DSM-5*, which includes deficits in social communication and social interaction along with restricted, repetitive patterns of behaviour, interests, or activities (American Psychiatric Association, 2013).

A pervasive characteristic of children with ASD is their difficulty establishing adult-child and peer-peer bonds (Autism Canada Foundation, 2011; O’Haire, 2013). Due to this difficulty, children with ASD may struggle to engage with their peers. This struggle can make them prone to experiencing social isolation resulting in an inability to participate in activities that both provide a source of joy and serve to promote their development (O’Haire, McKenzie, McCune, & Slaughter, 2013). O’Haire and colleagues (2013) assert that social isolation and a lack of social interactions early in the neurological process of development for children with ASD may lead to further impairment of neurotypical behavioural development, creating a cycle of increasing behavioural disturbances. Accordingly, this signals the need for the child’s primary caretaker(s) to address social skill deficits. Intervention strategies should be delivered as early as possible in order to provide the greatest likelihood of successfully improving these skills that are

critical to optimum long-term outcomes (Autism Speaks, 2015; Johnson 2015). The demand for support for social skills development for children on the spectrum continues to grow, and one increasingly popular source of support is the use of canines.

Due to reported benefits, families impacted by autism have become increasingly intrigued by the therapeutic effects that service canines can have on children with ASD (Burrows, Adams, & Spiers, 2008). Parents searching for service canines trained to work with children with ASD however, face formidable obstacles surrounding both the availability and cost of these canines. According to the Canadian National Service Canines (NSD) training centre, there is currently an 18-24 month waiting list for a service canine at a cost of \$18,000 CDN (NSD, 2012). Even if funds are available, the wait time is a deterrent for many families as the implementation of early intervention strategies is key to the developmental well-being of newly diagnosed children (Autism Speaks, 2015; Johnson, 2015).

For families impacted by autism, their decision to add a service canine is well-grounded in peer-reviewed findings in the field of Human-Animal Interactions (HAI) attesting to the benefits of the human-animal bond for children with ASD (e.g., Carlisle, 2012; Fine, 2010; Grandin, 2005; Levinson, 1984; O’Haire, 2013). However, with long wait-lists and the price tag for a service canine out of reach for many families, parents are increasingly turning to less vetted means of finding canines for their children. As parents seek informal routes to provide support for their child with autism, they are often left considering an untrained canine as a potential companion given the long waitlists and prohibitive cost of a service canine.

A study by Carlisle (2012; 2014) examining the role of pet canines in families of children with autism, revealed that children with autism can develop stronger social skills and assertiveness when they are closely connected to their companion canine. Therefore, a

successful bond between a child with autism and his/her canine is an especially important aspect of canine selection. Ensuring an optimal child-canine bond is critical, especially as canines hold potential to serve as social catalysts, facilitating social interactions and connections for children with ASD (Carlisle, 2012; McNicholas & Collis, 2000, O’Haire, 2013; Serpell, 1996). Indeed, in order to fully capitalize on the positive benefits that a canine can facilitate for a child with ASD, there is a need for a better understanding of what might influence this bonding process and how to ensure a successful child-canine bond develops (Hosey & Melfi, 2014).

1.2 Problem Statement

Autism is the most common neurological disorder affecting children (Center for Disease Control and Prevention, 2014). Human-animal therapeutic interventions based on utilizing the emotional aspects of human-animal relationships have the potential to be an effective tool in diminishing the withdrawal of children with ASD by targeting the core symptoms of the disorder (e.g., impairments in verbal and nonverbal communication, social interactions and restricted patterns of behaviour); (Berry, Borgi, Francia, Alleva, & Cirulli, 2013). Despite enthusiasm for integrating companion canines into the care plan for socially withdrawn children with ASD, research identifying factors that influence children on the spectrum’s ability to bond with a companion canine is meagre (Berry, Borgi, Francia, Alleva, & Cirulli, 2013). There is a particular dearth of empirical research examining the triad relationship between the child, the family canine, and the family as a means to identify what might influence a child on the spectrum's ability to bond with a companion canine.

The mechanisms or pathways through which child-canine bonding occurs in typically developing children remain largely unexamined. As well, a nuanced understanding of the human-animal bond for children on the spectrum has yet to be identified. For example, we lack

an understanding of what might influence a child with ASD to bond with his/her companion canine and what, if any, strategies are used by families to ensure this bond is established and nurtured. In addition, existing research has been focused on the effects of owning a companion canine for a child with ASD from the parents' perspectives (e.g., Burrows & Adams, 25; Coltea, 2011; MacKinnon, 2014). This knowledge gap leads to questions about what might contribute to or detract from the bonding process and how families impacted by ASD help ensure a strong canine-child bond. In order to successfully integrate a companion canine into a home environment, an understanding of the many personal and external factors influencing this interactive relationship is essential.

1.3 Statement of Purpose and Research Questions

The purpose of this multiple case study was to understand child-canine bonding with a focus on identifying the factors contributing to bonding in children with ASD to their family canines. Four areas requiring investigation were identified for this study. These included: 1) the identification of what, if any, components of attachment (e.g., safe haven, secure base, proximity seeking and separation anxiety) are evident in the relationship; 2) the identification of physiological and temperamental characteristics of canines that contribute to their bonding with children with ASD; 3) direct observations of interactions between a child with ASD and his/her companion canine; 4) and the identification of strategies employed by families to facilitate child-canine bonding. The two overarching research questions that guided this study were as follows:

1. Is there evidence that the attachment components of safe haven, secure base, proximity seeking, and separation anxiety are evident features of the child-canine relationship? If so, to what extent are these four features of attachment evident?

2. What are the prevalent themes emerging from interviews and observations of canine-child bonding?

1.4 Theoretical Frameworks: Family Systems Theory and Attachment Theory

Both Bowen's (1976; 1978) family systems theory and Bowlby's (1969; 1979; 1988) attachment theory provided a theoretical framework to guide this study's research questions. Systems theory is a theoretical framework based on the concept that a system can be best understood in the context of relationships with other systems, rather than in isolation. Systems theory was first introduced in the 1940s by biologist Bertalanffy (1968) and furthered by Ashby (1956) and Bateson (1979). Bowen's family systems theory is set apart from others as he was the first to widen his view of individual functioning to include reciprocal biosocial interactions, focusing on how families function as systems of influence.

Murray Bowen, trained as a psychiatrist, worked with individuals diagnosed with schizophrenia. Initially, the treatment primarily focused solely on the individual; however, he changed his methods after observing the relational interactions between the identified patient and his or her family members (Tate, 2015). Bowen was particularly interested in the dynamics that occurred between the patient with schizophrenia and the mother. The emotional intensity within this parent-child dyad revealed a level of involvement that made it difficult to view the patient with schizophrenia as a separate individual (Kerr & Bowen, 1988). Bowen furthered his examination of this type of interaction by including other nuclear family members (i.e., father and/or siblings). These breakthrough observations moved Bowen to acknowledge how influential the family system is on an individual's functioning (Kerr & Bowen, 1988).

Bowen's family system theory has since been used to describe how the social existence of human beings, in family groups, affects the functioning of each individual member within each

family (Craig, 2005). To date, there is no single systems theory about families (Cridland et al., 2013); Bowen however, was the leader in family systems theory and will therefore be referred to in this study.

Family systems analysis (Bowen, 1976; 1978) framework describes families as a system of interconnected and interdependent individuals. To understand an individual, we must understand the family system of that individual. An individual, certainly a young child, cannot be understood in isolation from his/her family system (Bowen, 1978). Children are embedded within multiple systems that interact both directly and indirectly to influence development and behaviour; the most important influence being the family system (Bronfenbrenner, 1979).

Bronfenbrenner (1979) asserts that the family system is the most important influence for children and subsequently impacts how they develop, behave, and perceive their environment. This sheds light on how influential the family system is for a child with special needs and more specifically, for a child with ASD. When families integrate a canine into their home and view the canine as a significant other, the family canine becomes a sub-system within the complex family system (Jalongo, 2015). Sub-systems are smaller units within a family (e.g., marital (or couple), parental, or sibling sub-systems) that together comprise the larger family system (Minuchin, 1974). From this perspective, family companion canines become nested within the family social system (Jalongo, 2015). Furthermore, Bowen (1979) believed that behaviour was best understood when viewed within the context of naturally occurring processes. Therefore, in order to gain an in-depth understanding of the child-canine bonding process this qualitative study investigated influences from within the family, including canines as part of the family unit, by utilizing a family systems perspective rather than in isolation from the family.

Bowlby's attachment theory (1979) was initially proffered to explain the development of deep emotional bonds characterizing close relationships. Given the complexities of the child-canine relationship in children with ASD, the terms "attachment" and "bonding" are used interchangeably in the current study. However, it must be noted that in an infant-caregiver relationship, the terms "attachment" and "bonding" have distinctive meanings. In an attachment-caregiver relationship, bonding refers to the parent's tie to the infant and is thought to occur within the first few hours or days of life (Bowlby, 1969). Attachment, in contrast, refers to the emotional relationship between infants and primary caregivers, which develops gradually (Bowlby, 1969).

Bowlby (1988) described attachment as a lasting psychological connectedness between human beings characterised by four distinguished features: 1) Their physical nearness and accessibility are enjoyable (proximity maintenance); 2) They are missed and become anxious when absent (separation distress); 3) They are dependable sources of comfort and provide a base to explore the environment (secure base); and 4) They are sought to alleviate distress (safe haven).

Although family systems theory and attachment theory are two separate theories, they complement each other in distinct ways. For example, the family system and the interactions within that system influence attachment styles in children (De Wolff & Van IJzendoorn, 1997). De Wolff and Van IJzendoorn (1997), found that attachment security in children is directly linked to parental sensitivity. These attachment styles in children are most commonly thought of as the attachments between a child and his/her parents (Bowlby, 1969). Not all of young children's attachments are to fellow human beings, however (Jalongo, 2015). Children can become attached to companion animals and display classic attachment behaviours, including:

seeking close physical contact (proximity seeking), protesting separation/striving to be reunited (separation anxiety), communicating through touch and nonverbal cues, acting as a base of security from which the child can explore the surrounding environment (secure base) and turning to the other for comfort (safe haven) (Melson, 2003).

The use of these two theoretical frameworks guided and supported the current study, helped determine appropriate research questions, and gave direction to interviews and discussions to focus the research. Both family systems theory and attachment theory provided a framework for investigating what factors might influence the child-canine bond.

1.5 Significance

This research is important because the findings hold potential to provide insights into what influences the bonding process between children with ASD and their companion canines. This research holds both theoretical and applied significance. Building upon emerging findings explicating bonding between children with ASD and their companion canines, this research holds promise to inform researchers about the nuanced interactions taking place within family contexts that facilitate child-canine bonding. The case study methodology offers unique advantages for identifying the salient characteristics of children, canines, and families contributing to successful bonding that would otherwise be difficult to access/observe. From an applied perspective, this research holds potential to inform parents seeking to support their children through the addition of a companion canine. There are familial, social, and economic ramifications arising from increasing awareness of the characteristics found in children, in companion canines, and families that nurture successful child-canine bonds.

1.6 Operational Definitions

Animal Assisted Therapy. Pet Partners (formerly the Delta Society) published the following widely cited definition for Animal Assisted Therapy (AAT).

Animal-Assisted Therapy (AAT): AAT is goal-directed intervention in which an animal that meets specific criteria can be a significant part of treatment for people with a physical, social, emotional, or cognitive diagnosis. AAT is directed and/or delivered by a health/human service professional with specialized expertise, and within scope of practice of his/her profession. Key features include: specified goals and objectives for each individual; and measured progress (Fine, 2010).

Service Canine. According to the Canadian Service Dog Foundation (2011) a service canine is individually trained to do work or perform tasks for the benefit of an individual with a disability, including a physical, sensory, psychiatric, intellectual, or other mental disability. The work or tasks performed by a service canine must be directly related to the handler's disability. Service canines are typically trained and certified by assistance canine organizations and have full public access right.

Therapy Canine. The Canadian Service Dog Foundation (2011) defines a therapy canine as a socially interactive canine trained to work for a handler to provide service and comfort to other people. Therapy canines can be found working in hospitals, retirement homes, nursing homes, schools, libraries, and rehabilitation units for children with learning disabilities or behavioural challenges. All therapy canines must have a friendly, patient, and gentle temperament.

Companion Canine. The Canadian Service Dog Foundation (2011) defines a companion canine as a family pet with no specific training or certification and does not have public access rights (Canadian Service Dog Foundation, 2011).

1.7 Presentation of the Thesis

This thesis is presented in five chapters. The second chapter provides a review of relevant literature in highlighting the knowledge gap that this study addresses. This review is followed by the research methods, findings, and discussion.

CHAPTER 2 – LITERATURE REVIEW

In this chapter, a review of relevant literature is presented in order to situate the current study and contextualize the knowledge gaps it addresses. There are four major sections in this chapter. The first section includes a definition of ASD. This is followed by a description of the characteristics and social skill challenges faced by children with ASD as well as a review on the impact that ASD can have on the family. Secondly, a brief description of HAI and its benefits for neurotypical adults and children as well as children with ASD is then provided. In addition, a review on the benefits of companion canines for children with ASD is included. The third section describes attachment theory and how this theory could be applied to the human animal bond between children with ASD and their companion canine. In the final section, research focused on human-animal bonding for children with ASD is reviewed and described.

2.1 Autism Spectrum Disorder

2.1.1 Defining Autism Spectrum Disorder

ASD cluster of developmental disorders including Asperger's Disorder, Autistic Disorder, Pervasive Developmental Disorder - Not Otherwise Specified and Childhood Disintegrative Disorder have been combined into the new category of ASD in the fifth edition of The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013). The previous version of the DSM, DSM-IV-TR (2000), classified each of the disorders listed above in separate categories and included a fifth disorder, Rhett Syndrome. With the release of the new DSM-5, one of the most significant changes is that the separate diagnostic labels of Autistic Disorder, Asperger's Disorder, and PDD-NOS are replaced by one umbrella term "Autism Spectrum Disorder" (American Psychiatric Association, 2013). This is in response to the need for a greater understanding of ASD (Autism Speaks, 2015).

The earliest publications on autism described atypical behaviours between child and adult social interactions, documented the presence of repetitive object use and insistence on sameness, and distinguished between autism and childhood-onset schizophrenia (Asperger, 1944; Kanner, 1943). The observations made by Dr.'s Asperger (1944) and Kanner (1943) remain relevant today and have shaped the current definition of autism (Ousley & Cermak, 2014). The use of the term "autism spectrum disorder" reflects the idea that the core features of ASD can be measured dimensionally and that they fall along a continuum of severity (Grzadzinski, Huerta, & Lord, 2013).

Prior to the publication of the DSM-5, children with an ASD diagnosis were specified by a level of functioning identified according to specific criteria in the DSM-IV-TR (American Psychiatric Association, 2000). Levels of functioning ranged from high-functioning ASD to low functioning ASD (4th ed., text rev.; DSM-IV-TR; American Psychiatric Association, 2000). With the release of the new DSM-5, distinctions are now made according to severity levels (American Psychiatric Association, 2013). The first two core criteria include: 1) An impairment in reciprocal social communication and social interaction; and 2) restricted, repetitive patterns of behaviours, interests, or activities (Center for Disease Control and Prevention, 2015). The severity levels are based on the amount of support required by the individual due to challenges with social communication as well as restricted interests and repetitive behaviours (American Psychiatric Association, 2013). For example, an individual might be diagnosed with ASD, Level 1 (support required), Level 2 (substantial support required), or Level 3 (very substantial support required); (American Psychiatric Association, 2013). In the DSM-5, in addition to evaluating the two core ASD domains, the characterization of ASD involves specifying whether or not intellectual and language impairments are present (American Psychiatric Association, 2013).

Further specifications include: whether or not the individual's diagnosis is associated with a known medical or genetic condition or environmental factor; whether or not the individual's diagnosis is associated with another neurodevelopmental, mental, or behavioural disorder; and whether or not the individual's diagnosis is associated with catatonia (Center for Disease Control and Prevention, 2015).

According to the DSM-5 (American Psychiatric Association, 2013), the defining characteristics of ASD include deficits in each of the following four criteria (A, B, C, & D):

A. Persistent deficits in social communication and social interaction across contexts, not accounted for by general developmental delays, and manifest by all 3 of the following:

1. Deficits in social-emotional reciprocity; ranging from abnormal social approach and failure of normal back and forth conversation through reduced sharing of interests, emotions, and affect and response to total lack of initiation of social interaction,
2. Deficits in nonverbal communicative behaviours used for social interaction; ranging from poorly integrated- verbal and nonverbal communication, through abnormalities in eye contact and body-language, or deficits in understanding and use of nonverbal communication, to total lack of facial expression or gestures.
3. Deficits in developing and maintaining relationships, appropriate to developmental level (beyond those with caregivers); ranging from difficulties adjusting behaviour to suit different social contexts through difficulties in sharing imaginative play and in making friends to an apparent absence of interest in people

B. Restricted, repetitive patterns of behaviour, interests, or activities as manifested by at least two of the following:

1. Stereotyped or repetitive speech, motor movements, or use of objects; (such as simple motor stereotypes, echolalia, repetitive use of objects, or idiosyncratic phrases).
2. Excessive adherence to routines, ritualized patterns of verbal or nonverbal behaviour, or excessive resistance to change; (such as motoric rituals, insistence on same route or food, repetitive questioning or extreme distress at small changes).
3. Highly restricted, fixated interests that are abnormal in intensity or focus; (such as strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).
4. Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of environment; (such as apparent indifference to pain/heat/cold, adverse response to specific sounds or textures,

excessive smelling or touching of objects, fascination with lights or spinning objects).

C. Symptoms must be present in early childhood (but may not become fully manifest until social demands exceed limited capacities)

D. Symptoms together limit and impair everyday functioning (pp. 88-89).

2.1.2 Characteristics of Autism Spectrum Disorder

According to the DSM-5 (American Psychiatric Association, 2013), ASD is characterized by persistent deficits in social communication and social interaction across multiple contexts.

This includes deficits in social reciprocity, nonverbal communicative behaviours used for social interaction, and skills in developing, maintaining, and understanding relationships. In addition to social communication deficits, a diagnosis of ASD requires the presence of restricted, repetitive patterns of behaviour, interests, or activities (e.g., repetitive use of objects, excessive resistance to change, preoccupation with unusual objects, excessive smelling or touching of objects).

Within the diagnosis of ASD, individual clinical characteristics are noted through the use of specifiers (i.e., with or without accompanying intellectual impairment; with or without accompanying structural language impairment; associated with a known medical/genetic or environmental/acquired condition; associated with another neurodevelopmental, mental, or behavioural disorder), as well as specifiers that describe the autistic symptoms (i.e., age at first concern; with or without loss of established skills; severity). These specifiers provide clinicians with an opportunity to individualize the diagnosis and communicate a richer clinical description of the affected individuals (Autism Speaks, 2015).

Impairments in verbal and nonverbal communication, age-specific play patterns, social interactions and restricted patterns of behaviour are key features indicative of ASD (Berry et al., 2013). The most disabling challenges are limitations in social skills, which can include, but are not limited to the following areas: social reciprocity (a range of back-and-forth actions, such as

gestures, sounds, play, attention, and conversation), non-verbal communication and both the development and maintenance of relationships (Leach & LaRocque, 2011; O’Haire, 2013).

2.1.3 Social Skills of Children with Autism Spectrum Disorder

Social limitations represent the most pervasive characteristics of children with ASD often leading to difficulties establishing adult-child and peer-peer bonds (Autism Canada Foundation, 2011; Johnson, 2015; O’Haire, 2013). Although children with ASD range in their severity levels, deficits in the ability to socially interact and engage with others remain consistent (Chamberlain, Kasari, & Rotheram-Fuller, 2007). Thus it is common across severity levels 1 to 3 and represents an important area to address for children with ASD. Given these findings, it is of utmost importance to develop new strategies and identify therapies in which children with ASD can enhance their social skills in order to successfully participate in their environments and develop skills necessary for future employment opportunities (Johnson, 2015).

Interventions based on improving social skills, communication and reducing problematic behaviours (e.g., tantrums and repetitive behaviours) currently represent the most effective tool for ASD management (Vismara & Rogers, 2010). Furthermore, addressing social skill deficits and problem behaviours with ASD may be an effective approach to reducing parental stress (Carlisle, 2012; 2014). Despite the large and varied number of behavioural and developmental interventions that exist, no one method has proven to be universally effective for the treatment of ASD (Berry et al., 2013). Therefore, the need for further research is imperative in order to identify alternative approaches to support children with ASD.

2.1.4 Impact of ASD on the Family

Having a family member with autism may present particular challenges for the family unit (Kaminsky & Dewey, 2002). Such challenges include accommodation of inflexible daily

routines, management of sudden mood changes and tantrums, and management of withdrawal during social interactions (Heiman & Berger, 2008; Macks & Reeve, 2007). ASD therefore affects the individual diagnosed with the disorder as well as the family in a variety of ways (Macks & Reeve, 2007). For this reason, Neely-Barns, Hall, Roberts, and Graff (2011) referred to families who have a member with ASD as families living with ASD.

A number of studies have examined the effects of ASD on the family (e.g., Altieri & von Kluge, 2009; Dabrowska & Pisula, 2010; DeGrace, Hoffman, Hutson & Kolobe, 2014; Ekas & Whitman, 2011; Weitlauf, Vehorn, Taylor, & Warren, 2014). DeGrace and colleagues (2014) conducted a qualitative study to explicate the experiences of living everyday life following the diagnosis of autism. Seven families were interviewed using grounded theory methodology, a systematic methodology involving the construction of theory through data analysis. The families' experiences aggregated into a three phase model: 1) experiences; 2) mediators; and 3) family outcomes. DeGrace and colleagues (2014) used the term 'navigating the unknown' to collectively describe the families' experiences following the diagnosis of their child. The unknown was defined as a phase of questioning, feelings of uncertainty, and worrying. These feelings could stretch from utter confusion on how to manage their child's behaviour and accommodate everyday tasks, to tentative feelings on how to implement new ways of doing things as a family unit. This study revealed that the prevailing experience of these families was the feeling of "not knowing."

In an exploratory study by Nealy, O'Hare, Powers and Swick (2012), the authors examined mothers' perspectives of ASD. Qualitative semi-structured interviews with mothers were conducted and four primary themes emerged. Prevailing themes of loss and depression were apparent. As well, reduced opportunities for fun and recreational activities, changes in

social relationships, and personal sacrifices became evident as issues affecting the well-being of mothers of a child with ASD. This study sought to identify ways of supporting families impacted by autism. Based on their findings, Nealy and colleagues (2012) recognized that there is a need to utilize alternative strategies and provide services that focus on family well-being in order to support the family unit as well as the well-being of each family member.

To further explore the impact of ASD on the family unit, Ekas and Whitman (2011) used a daily diary methodology to examine the daily stress and coping in mothers with a child with ASD. This study sought to assess the day-to-day impact of child related stress on maternal negative affect. Through the use of daily diaries, this study found that mothers of children with ASD experienced increased negative affect. However, when mothers experienced above average stress due to both life stressors and child stressors, there was a decrease in negative affect. This finding suggests that when mothers who have a child with ASD experience high levels of stress in multiple domains of their life, they eventually seek out supports and resources to cope and seek relief (Ekas & Whitman, 2011). In addition, Ekas and Whitman (2011) identified that increased positive affect served as a protective factor for mothers who have a child with ASD. Despite these findings, intervention strategies designed to help mothers generate positive emotions during stressful times are meagre (Ekas & Whitman, 2011). Strategies that are available tend to teach mothers how to cope with their child's challenging behaviours (e.g., Sofronoff & Farbotko, 2002) rather than assisting mothers in addressing the other numerous challenges and daily obstacles that often occur (Ekas & Whitman, 2011).

Overall, researchers suggest that having a family member with ASD can present a range of distinct challenges on the family unit. Families, and especially mothers, living with children with ASD experience high levels of stress (DeGrace et al., 2014; Nealy et al., 2010). Further

research examining the complex interplay of factors contributing to the stress and challenges for families impacted by ASD is needed (Cridland, Jones, Magee, & Caputi, 2014). An investigation of coping and support mechanisms to alleviate the stress experienced by families living with ASD is warranted (Cridland et al., 2014; MacKinnon, 2014). Support from companion canines can be one source of support for these families (e.g., Berry et al., 2013; Carlisle, 2012; Sams, Fortney, & Willenbring, 2006; O’Haire, 2013). Evidence for the idea that the addition of a companion canine can act as an informal therapeutic intervention for both the family and the child living with ASD is found throughout human-animal literature. The effects of companion animals, and especially companion canines, on reducing stress are presented next.

2.2 Human-Animal Interaction

2.2.1 Benefits of Human-Animal Interaction

The field of HAI explores the bond between humans and animals and the role the human-animal bond plays in empathy development, social development, the ability to form and express attachments, reaction to grief and loss, the challenges of aging, and other developmental passages throughout the lifespan (Human-Animal Interaction, 2015). In addition, the field of HAI examines the role of AAT in prevention and intervention programs within a variety of settings (Human-Animal Interaction, 2015).

Although it is still a relatively new area of research, there is ample and emerging empirical evidence supporting the therapeutic benefits of animal companionship. The human-animal bond has long been documented and is a well-known phenomenon that has existed since humans began domesticating animals (Turner, 2007). The benefits of the human-animal bond are widely reported in literature for typically developing children and adults (e.g., Cole, Gawlinski, Steers, & Kotlerman, 2007; Fine, 2010). Researchers have identified that HAI can

influence psychological (Cole, Gawlinski, Steers, & Kotlerman, 2007; Jofre, 2005), physiological (Havey, Vlasses, Vlasses, Ludwig-Beymer, & Hackbarth, 2014; Kaplan & Ludwig-Deymer, 2004; Friedmann & Thomas, 1995), and social-psychological parameters important to health and well-being (Banks & Banks, 2002; Johnson, 2010).

Many studies have addressed the contribution of HAI to human psychological well-being. Findings have revealed that HAI can decrease stress (Allen & Blascovich, 2002), increase emotional support and sense of psychological well-being (Straede & Gates, 1993), and increase resilience during times of adversity (Mulcahy & McLaughlin, 2013).

In addition to psychological benefits, researchers have also reported on the physiological and social psychological benefits of HAI (e.g., Fine, 2010; Friedmann & Thomas, 1995; McNicholas & Collis, 2000). Researchers have argued that AAT and companion pets can enhance social well-being for typically developing children and adults (Friedmann & Son, 2009; McNicholas & Collis, 2000; O'Haire, McKenzie, McCune, & Slaughter, 2013).

In a study by O'Haire and colleagues (2013), the researchers investigated the effects of a classroom-based animal-assisted activities program using guinea pigs was examined. Participants randomly selected to be in the experimental group were enrolled in the animal-assisted activity program. Participants in the experimental group ($n = 64$) compared to participants in the waitlist control group ($n = 64$) demonstrated significantly greater improvements in social functioning. Social functioning was defined by greater increases in social skills and decreases in problem behaviours.

In a study by McNicholas and Collis (2000), the authors found that canines act as social catalysts by facilitating social interactions and increasing interpersonal interactions and connections. They measured this effect by recording the number and quality of interactions

experienced by a canine handler when in public with a canine compared to interactions without a canine. When the canine was present, the length and frequency of social interactions increased.

Additionally, Friedmann and Son (2009) reviewed studies examining the human-companion animal bond and concluded that companion animals can provide social support by facilitating social interactions thereby reducing social isolation and psychological distress.

Johnson (2010) also identified psychosocial benefits from HAIs including reduced feelings of depression, loneliness, and anxiety.

For individuals with disabilities, who may be socially avoided by others and therefore experience social isolation and feelings of loneliness, the role of animals as social catalysts is especially important. Children with ASD face unique challenges establishing adult-child and peer-peer due to social interaction and communication deficiencies (Ekas & Whitman, 2011; O'Haire, 2013). In the following section, research detailing how companion pets, and especially canines, have the potential to enhance social skills by providing social support, reducing stress and facilitating social interaction is presented.

2.2.2 Autism Spectrum Disorder and Human-Animal Interaction

There is ample empirical evidence supporting the therapeutic benefits of animal companionship. Given the established benefits of HAI, it is not surprising that researchers in child development have found that animals can play a vital role in a child's life. Interactions with pets can contribute to the development of the sense of self, imagination, play, empathy, and social responsibility in children (Ascione 2005; Fine, 2010; Jalongo, 2015; Melson, 2001; Solomon, 2010).

The beneficial effects of animals on severely withdrawn children date back to the 1960s (Berry, Borgi, Francia, Alleva, & Cirulli, 2013). Dr. Boris M. Levinson (1969), a renowned

psychologist and founder of the modern pet therapy movement, recognized that playful interaction with canines could improve sociocommunicative abilities of children with autism. He believed that the use of a well-trained animal could serve as a catalyst to help children deal with emotional and behavioural problems. Levinson's (1969) recognition of animals' potential as communicative partners and their ability to provide emotional support was perhaps the foundation for the first use of canines as therapeutic adjuncts (Solomon, 2010).

Individuals with autism may exhibit behaviours toward animals that they do not exhibit toward their family (McNicholas & Collis, 2000). For children with ASD, handling social relations can be challenging (Bystrom & Persson, 2015). Because of these challenges in establishing and maintaining social connections, bonding with a companion animal may lead to opportunities to practice social interactions and facilitate subsequent social connections to others (Bystrom & Persson, 2015).

Temple Grandin (2005), a renowned author, lecturer, and animal behaviour expert, has written extensively about her experiences with autism and her ability to relate to animals. Grandin and her colleague Johnson (2005), hypothesized that people with ASD and animals share cognitive similarities. Animals rely on their sensory-based thinking (visual, auditory, and tactile senses) in order to gather information regarding their surrounding environments (Grandin & Johnson, 2005). Individuals with ASD, and in particular non-verbal individuals, have difficulty comprehending the thoughts and feelings of their peers and will negotiate their environments through the use of sensory-based thinking (Grandin & Johnson, 2005). Children with ASD have been described as having a deficit in theory of mind; the ability to understand the thoughts or intentions of others (Baron-Cohen, 1995). Although animals are interactive, children perceive them as non-judgemental participants and are not influenced by the expectations of

typical human relationships (Friesen, 2010). The absence of the necessity to “read” a canine’s mind may provide an explanation for the increased ability of a child with ASD to interact in a social way with a canine (Solomon, 2010). This unique interaction offers typical and atypical children a valuable form of social and emotional support (Friesen, 2010).

The human-animal bond transcends companionship. It is a strong, positive and mutual interaction between humans and animals that has the potential to provide emotional support and comfort as well as affection (Berry, Borgi, Francia, Alleva, & Cirulli, 2013). Human-animal therapeutic interventions based on utilizing these emotional aspects of human-animal relationships have the potential to represent an effective tool to diminish the withdrawal of children with ASD by targeting the core symptoms of the disorder (e.g., impairments in verbal and nonverbal communication, social interactions and restricted patterns of behaviour); (Berry et al., 2013). A meta-analysis of 49 studies investigating AAT by Nimer and Lundahl (2007), found that its use led to improved behavioural symptoms of ASD, and canines were the type of animal associated with the most significant benefits. The simple interpretable feedback behaviours that characterize animals, especially canines, facilitate social interactions that do not require the interpretation of verbal cues (Solomon, 2010). This nonverbal engagement is especially important for children with ASD given their potential difficulties participating in social interactions requiring verbal exchanges (Solomon, 2010).

2.2.3 Service and Therapy Canines for Children with Autism Spectrum Disorder

Burrows, Adams and Spiers (2008) studied the effects of service canines on the general welfare of ten families affected by ASD. The primary function of integrating service canines into these families was to ensure safety by inhibiting children from bolting and wandering dangerously (e.g., walking in the middle of a road). Their findings extended beyond children’s

physical safety to communicative and therapeutic realms (Burrows et al., 2008). Parents reported that the integration of a service canine resulted in beneficial effects on children's behaviour including reduced levels of anxiety and emotional outbursts, increased calmness and overall happiness, and more manageable bedtime routines. Parents also reported an additional sense of security due to the presence of the service canine. Furthermore, when outside of the home, the service canine became the focus of attention alleviating some of the stress felt by the family and the siblings during social activities.

In another study examining the therapeutic use of service and therapy canines' for children and teens with autism, Solomon (2010) conducted two case studies investigating how canines mediate social engagement of children with ASD. The findings of this study illustrated how canines can support and encourage children's communication, emotional connection with others, and participation in everyday life. The author described how canines' participation in social interaction can support the sociality of children with ASD. For a child with ASD, sociality refers to the quality or state of being social and interactive with others (Solomon, 2010). It was concluded in this study that canines have the ability to elicit prosocial behaviours and seem to possess a unique capacity to serve as an emotional bridge and act as social catalysts.

In another study by Viau, Arsenault-Lapierre, and Fecteau (2010), the physiological effects of owning a service canine for a child with ASD were examined. Viau and colleagues (2010) measured cortisol levels, a stress hormone, by taking saliva samples before, during, and after children with ASD interacted with a service canine. The aim of this study was to examine whether the effects of a service canine altered the levels of cortisol and the cortisol awakening response (CAR) in a child with ASD. CAR responds to an increase in cortisol secretion and is an indication of stress and disease (Viau et al., 2010). The authors found that CAR decreased

upon introduction to the canines and increased after removal of the canines. These findings suggest that CAR is sensitive to the presence and absence of a service canine for children with ASD. In addition, parents also reported that problematic behaviours (e.g. repetitive behaviours, aggression, tantrums) decreased when the canines were present (Viau et al., 2010).

In another study exploring how canines can modulate the behaviour of children with ASD, Silva, Correia, Lima, Magalhaes, and de Sousa (2011) conducted a case study on a 12 year old boy diagnosed with ASD ($N = 1$). The participant participated in forty-five minutes of structured sessions of one-to one activities with the therapist in the presence of a therapy canine or without the presence of the therapy canine (as a control). The behaviour of the participant was continuously video-recorded during both experimental and control conditions to allow for cross condition comparisons. In the presence of the canine, negative behaviours decreased (e.g., physical and verbal aggressive behaviours, repetitive behaviours) and positive behaviours increased (e.g., smiling, play, positive physical contact, affection). In another study examining the effects of canines on the behaviour and social skills of children with ASD, Martin and Farnum (2002) observed children's social behaviour when interacting with a live canine (treatment 1) compared to a stuffed canine (treatment 2) or toy ball (controlled condition). Their findings revealed that children with ASD were less distracted and more aware of their social surroundings when the live canine was present during their therapy session. Furthermore, children were most likely to engage in conversation and initiate focused eye gaze when the live canine was present.

The studies reviewed here provide a foundation for the present investigation and identify the beneficial effects of integrating a service and/or therapy canine into the care plan for a family impacted by ASD. Language impairments and social deficits are the most pervasive symptoms

characterizing children with ASD (Berry et al., 2013). Interaction with a therapy and/or service canine proves to be an effective tool in promoting verbal and nonverbal behaviours as well as decreasing problematic behaviours (Berry et al., 2013). However, as previously identified, therapy canines are trained to work for a handler to provide service and comfort for other people. Therefore, therapy canines are only temporarily available to spend time with a child with ASD and do not become a permanent part of the family unit. Furthermore, the high cost and long wait-list for a highly trained service canine become a deterrent for most families leaving them to turn to less vetted means of finding canines for their children. Being one of the most popular pets in North America, companion canines (a family pet with not specific training or certification) often become the canine of choice for families impacted by ASD (Coltea, 2011). It is important to stress however, that the studies reviewed in this section focus on the beneficial effects of service and therapy canines for children with ASD. There are only two peer-reviewed studies (e.g., Bystrom & Persson, 2015; Carlisle 2012; 2014), discussed in the following section, that have examined how children with ASD benefit from the presence of a companion canine on an everyday basis within their family lives.

2.2.4 Companion canines for Children with Autism Spectrum Disorder

Emerging work by Bystrom & Persson (2015), used focus-group discussions to understand parents' perspectives on how children and adolescents with ASD benefit from a companion animal. Three main themes emerged in this study regarding the importance of companion animals for children with ASD: 1) the quality of the relationship with the companion animal; 2) increased interaction with people; and 3) optimization of the child's function and development. The relationship shared between these children and their companion animals were categorized as close or general. Close relationships were characterized by mutual contact and

signs of affection (e.g., petting, snuggling, and grooming) whereas general relationships were characterized by children who were more content when their companion animal was nearby however, did not seek contact or display obvious signs of affection.

Findings also revealed that social interaction and contact with other children was facilitated when the children were in the presence of a canine (Bystrom & Personn, 2015). Companion animals, especially canines, were found to reduce social anxiety and give the child the courage to respond to people who initiated contact with them. Additionally, parents reported that the companion animal reduced stress, helped regulate emotions and depression, and provided support through challenging life events. The quality of the child-animal relationship was found to enhance these positive effects when their relationship was characterized as being close. Although this study did not identify what might influence the strength of the relationship shared between these children and their companion animal, the present findings support the notion that companion animals can provide social and behavioural support and improve mental health and quality of life for children with ASD. Canines in particular were reported to have the most significant impact on helping children with ASD socially interact with people outside of the family.

In her doctoral dissertation (2012) and subsequent publication (2014), Carlisle examined the role of pet canines in families of children with ASD. In this descriptive study, data was collected through a telephone interview with both parents ($N = 70$) and children ($N = 47$).

Parents who decided to integrate a pet canine into their family described having previous experience with canines and beliefs in their beneficial effects for children with ASD as influential in their decision-making process (Carlisle, 2012; 2014). The Companion Animal Bonding Scale (CABS), a survey used to identify the quality of human and pet relationships and

attachment to pets, was administered to the children participants to assess information regarding child-canine bonding. Increased interaction time, positive affect (e.g., they say they love their canine), positive ideas about their canine (e.g., their canine provides support and companionship), and positive behaviour towards their canine (e.g., active play) were identified as primary interactions influencing the bonding process. Carlisle's work (2012) examining the topic of bonding between family companion canines and children with ASD, suggests that children's social skills may be enhanced, particularly around exercising assertion (e.g., making requests, expressing views or opinions). Carlisle's study adds additional evidence that for children with ASD, the ability to establish a secure attachment with a canine may increase their ability to seek social relationships with others (Carlisle, 2014).

2.3 Attachment Theory and the Human-Animal Bond

John Bowlby was the first attachment theorist (1969, 1979, 1988). Understanding attachment formation in children has since been a focal point in child development research. Attachment theory was proposed by John Bowlby (1969, 1979, 1988) and advanced by Ainsworth's (1989) work on how the bond between a mother and child may extend to other attachments a child makes as he/she matures. The bonding process in humans using attachment theory as a framework have been well researched. Studies investigating its application on human-animal bonding have also been conducted (e.g., Beck & Madresh, 2008; Kurdek, 2008; Kwong, 2007). Three distinct areas comprising attachment theory support the present investigation and include: 1) attachment theory and its application on human-animal bonding for adults and children; 2) attachment theory and its application on human-animal bonding for children with ASD; and 3) influences on the canine-human dyad.

One of the major challenges with research in this area has been the lack of theoretical rigour in relation to the ideas, concepts and definitions that underpin the notion that humans can form strong attachments to animal companions (Beck & Madresh, 2008; Hosey & Melfi, 2014; Rockett & Carr, 2014). Employing attachment theory in the exploration of human-animal bonding provides researchers with a conceptual framework (Rockett & Carr, 2014). As an example of research investigating the human-animal bond, Kurdek (2008) examined the extent to which the four features of attachment (i.e., proximity seeking, separation anxiety, safe haven, and secure base) are exhibited in human-canine relationships. Kurdek (2008; 2009) applied attachment theory to study human-canine bonding by asking participants to indicate how strongly (1 = strongly disagree, 7 = strongly agree) they agreed with four statements for each of the four features of attachment regarding their pet canine. His results suggest that canines satisfy these four attachment functions. However, Kurdek identified that proximity seeking was the most salient function of attachment and safe haven the least salient. Despite the variation in attachment functions, Kurdek (2009) concluded that humans can form attachment with animals that are consistent with the human literature on attachment theory.

A secure attachment to a primary caregiver is one of the first and most basic needs in an infant's life (Bowlby, 1988). In a study investigating attachment security, Beck and Madresh (2008) sought to compare how secure participants felt in their relationship with their pets versus their romantic-partner. A web-based survey of 192 pet owners was conducted. Their results revealed that pets were a consistent source of attachment security. Pet owners claimed to experience more security in relationships with their pets than with their partner. The authors speculate that the reason for this finding could be attributed to the idea that companion animals

can provide a consistent, controllable and dependable source of security than is provided in relationships with humans.

Building from these findings, Kwong and Bartholomew (2011) explored individual relationships with a service canine. Semi-structured interviews were used to assess the extent to which the four features of attachment were evident. This qualitative study employed thematic methods to analyze semi-structured interviews with participants regarding their relationship with their service canines. Findings from this study revealed that the most salient characteristics of attachment between an individual and his/her service canine were *safe haven* and *secure base*. Their research demonstrated that animals can fulfill all attachment figure functions. However, it must be noted that the specific characteristics of this relationship (e.g., the participants have a disability that requires assistance from their service canine) might influence the human-animal bond in a distinct way. For example, the participants are more reliant on their service canines therefore increasing the likelihood of developing a bond that reflects an attachment bond.

The notion that animals are capable of providing *safe haven* and *secure-base* functions was supported in a study by Zilcha-Mano, Mikulincer, and Shaver (2012). Pet owners were asked to perform one of two distinct tasks to assess the extent to which a pet canine can provide safe haven and secure base. Study 1 consisted of 165 pet owners who were asked to perform an exploration activity which consisted of thinking about their future goals. Participants who were in the physical presence or cognitive presence (i.e., thinking about their pet) of their pet generated more goals and reported greater confidence in attaining these goals than the participants with no pet presence. Study 2 consisted of 120 pet owners who were asked to perform a distress-eliciting task (i.e., an extremely difficult cognitive task). Participants who were in the physical or cognitive presence of their pet exhibited lower blood pressure elevation

during the distressing task than the participants in the no pet presence condition. Findings revealed that the presence of a companion animal (canine or cat) was sufficient to heighten self-confidence, lower distress and increase task performance in participants compared to participants not in the presence of an animal. The findings lend support to the contention that a pet provides safe-haven and secure-base functions.

To date, most studies examining the development of human-animal attachments have focused on adults' interactions with the canines that they own rather than on children (Jalongo, 2015). Much less is known about the development of a relationship between children and their companion animals (Westgarth et al., 2013). In one study by Melson (1990), the author described human-animal attachment between children and their pets using a four component model. Each component provides insights into the quality and strength of the bond and included: 1) "time with pet; 2) affect toward pet; 3) ideas about pet; and 4) behaviours toward pet" (Melson, 1990, p. 89). Following Melson's (1990) four component model, Carlisle (2012; 2014) found that increased interaction time, positive affect, positive ideas about their canine, and positive behaviour towards their canine were associated with a stronger bond.

In a study by Daly and Morton (2006), findings revealed that elementary school aged children who reported to be more attached to their pets were more empathetic to others (Daly & Morton, 2006). In studies examining pet attachment and gender differences, girls were more likely to own a pet, however, boys were just as likely to be attached to their pets as girls (Stevens, 1990; Westgarth et al., 2013). This is important to note given that ASD is almost 5 times more common among boys (1 in 42) than among girls (1 in 189) (Centers for Disease Control and Prevention, 2015). However, the topic of human-animal bonding for children with autism remains largely unexamined and even the studies done to date are wrought with sampling

and methodological limitations. For example, Carlisle (2012; 2014) administered CABS via a telephone survey to gather information regarding child-canine bonding for children with ASD. Given that children with ASD often face challenges in their ability to socially interact and engage with others, data collection methods such as telephone interviews and surveys are often inappropriate to use for this particular population. Although studies examining how children bond with their animal companion and more specifically, how children with ASD bond with their animal companion remains meagre, several studies have investigated what might influence the human-animal bonding process in typical children and adults.

In Kurdek's (2008) study, the author found that high levels of human caregiving were associated with high levels of attachment to canines. In addition to this study, caregiving was also found to be an important feature contributing to the development of strong human-canine bond in Kwong and Bartholomew's study (2011). This suggests that caregiving toward a canine may facilitate the formation of a mutual bond (Kurdek, 2008). This aligns with Bowlby's (1969) notion that the attachment behavioural system is complimented by reciprocal caregiving. In addition to these findings, Cohen (2002) identified that the more time adults spent with their pets, the more likely they would report a strong bond with their pets.

Drawing from broader child-pet literature, several findings inform our understanding of factors contributing to strong child- canine bonds. Melson (2001) posits that children are more likely to establish a strong bond with their companion animal when they are involved in caring for it. For example, when children are involved in grooming, feeding, watering, exercising, and playing with their canines a stronger bond is more likely to develop (Myers, 2007).

Additionally, in another study examining pet attachment in grade school children, it was

identified that when children played with their pet and were involved in pet care, a stronger attachment was more likely to develop (Melson, Peet, & Sparks, 1991).

2.4 Summary and Conclusion

This review of the literature argued that attachment theory is an appropriate framework supporting the investigation of the human-animal bond. However, there has been limited investigation on the human-animal bond for children with ASD. More specifically, the mechanisms or pathways through which child-canine bonding occurs remains largely unexamined and a nuanced understanding of the human-animal bond for children on the spectrum has yet to be identified. There is a particular lack of research investigating children within the context of everyday life, including family influences that potentially impact the bonding process (Hosey & Melfi, 2014). To address these gaps, this study will examine the triad relationship between the child, the canine, and the family as a means to identify what might influence a child on the spectrum's ability to bond with a companion canine.

For a child with autism, an attachment to a canine companion may provide a positive relationship experience, provide opportunities for social skill development and in turn, increase the willingness of these children to seek out other social relationships. Currently, data collection methods in the field primarily rely on formats that do not directly involve children themselves and are often inaccessible to children, particularly, for children with ASD (e.g., surveys, telephone interviews, detailed representational drawings) (Jalongo, 2015). Methods including direct observation, individual interviews, and the use of photographs and drawings are needed given the nuanced interactions that exists to indicate the presence or absence of bonding (e.g., proximity, frequency of interactions, initiations of interactions, touch). Without the use of appropriate methods that are accessible to this population, children with ASD will continue to be

under-represented in the research (Hosey & Melfi, 2014; Jalongo, 2015). To address this issue, this study employed semi-structured interviews with the parents as well as observations of child-canine interactions in order to gain insights into factors contributing to the bonding process.

CHAPTER 3 – RESEARCH METHODS

This chapter begins with a discussion of the rationale for the research design followed by a description of the research methods that were employed in this study. The first section includes a brief review of the purpose of the study and an outline of the research questions that guided this investigation. This is followed by an overview of qualitative research and why this paradigm was best suited for this particular study. The final section details the selected case, the research sample, data collection procedures, approaches to data analysis, and how the fidelity of this study was ensured.

Despite enthusiasm for integrating companion canines into the care plan for children with ASD, research examining factors that might influence children on the spectrum's ability to bond with a companion canine is lacking (Berry et al., 2013). Further investigation into the process of the human-animal bond is needed; specifically, the process of the human-animal bond for children with ASD. The choice of a qualitative case study methodology responds to, and is best suited to address, the limitations identified in the HAI literature reviewed in the previous section and is in alignment with research needs identified by key writers in the field of HAI (e.g., Berry, Borgi, Francia, Alleva, & Cirulli, 2013; Fine, 2010; Millman, Adams, & Burrows, 2008; O'Haire, 2013). We currently lack an understanding of what might influence a child with ASD to bond with his/her companion canine and what attachment looks like across cases. Given the nuanced interactions that exist to indicate the presence or absence of bonding (e.g., proximity, frequency of interactions, initiations of interactions and touch) this study employed observations and interviews to gain insights into factors contributing to child-canine bonding.

Four areas requiring investigation have been identified for this study. These included: 1) the identification of what, if any, components of attachment (e.g., safe haven, secure base,

proximity seeking and separation anxiety) are evident in the relationship; 2) the identification of physiological and temperamental characteristics of canines that contribute to their bonding with children with ASD; 3) direct observations of interactions between a child with ASD and his/her companion canine; 4) and the identification of strategies employed by families to facilitate child-canine bonding. The two overarching research questions that guided this study were as follows:

1. Is there evidence that the attachment components of safe haven, secure base, proximity seeking, and separation anxiety are evident features of the child-canine relationship? If so, to what extent are these four features of attachment evident?
2. What are the prevalent themes emerging from interviews and observations of canine-child bonding?

The aim of this research was to examine the dynamic, triad relationship between the child, the family companion canine, and the family unit. The objectives of this research were to observe child-canine interactions, identify strategies used to facilitate child-canine bonding and identify characteristics of children with ASD, family companion canines, and families themselves that contribute to a successful child-canine bond.

3.1 Rationale for a Qualitative Research Approach

Due to the exploratory nature of this study and the paucity of research elucidating factors impacting the child-canine bond, a qualitative approach was deemed best suited to uncovering answers to the above-stated research questions. Qualitative research is useful in generating new ideas and theories and examining an area where little is known and findings remain scarce (Richards & Morse, 2013).

Qualitative research is an inquiry process of understanding based on distinct

methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants and conducts the study in a natural setting (Creswell, 1998, p. 15).

Given the dearth of research exploring the child-canine bond for children with ASD, qualitative methods hold potential to uncover, identify and highlight key dimensions of the child-canine bond. Further, qualitative methods, particularly those grounded in case study analysis and observations are best suited to the target population, children with ASD and family canines. Though the use of quantitative paper-and-pencil measures (i.e., public domain scales assessing various dimensions of parenting or child-parent bonding) could be used with parent participants, given the developmental challenges of the children in this study, the completion of quantitative surveys is unsuitable. The use of qualitative methods here holds the potential to advance our understanding of autism as well as inform researchers and practitioners about the nuanced interactions taking place within family contexts that facilitate child-canine bonding.

3.1.1 Rationale for a Case Study

This study's research questions necessitated a research approach that could identify factors that might influence the child-canine bonding process. The appropriate research approach, therefore, must take into account the everyday details and significant events of family interactions and do this in a way that is conscious of the contributions of all participants, both human and canine. Given the subjective and contextually dependent nature of the human-animal bond, a case study approach was used to investigate the phenomena of bonding between children with ASD and companion canines.

3.1.2 Case Study

A case study is an approach to research that focuses on gaining an in-depth understanding of a particular entity or event and emphasizes a detailed contextual analysis (Stake, 1995).

Studies in the social sciences, in particular, have made wide use of this data collection strategy to examine real-life situations (Cassell & Symon, 1994, 2004; Stake, 1995). For example, case studies have been used to examine student motivation (Shaffer, 2015), to investigate the social engagement of children with ASD (Conn, 2014), and to document and examine breast cancer survivors' experiences (Burke & Sabiston, 2012).

According to Stake (1995), in order to understand complex social phenomena, investigators need to retain the holistic and meaningful characteristics of real-life events and the use of the case study approach allows this. Case study research stresses the holistic examination of phenomenon (Jorgensen, 1989) and seeks direct engagement with the social world and in-depth investigation through observations, interviews, documentary analysis and examination of artifacts (Gomm, Hammersley, & Peter, 2000). The case studied may be a culture, society, community, subculture, organization, group, or phenomenon such as beliefs, practices, or interactions, as well as almost any other aspect of human existence (Creswell, 2007). Rather than being a methodological choice, a case study is a paradigmatically flexible approach (Luck, Jackson, & Usher, 2006) that signifies an intensive focus on a particular case(s) (Rosenberg & Yates, 2007; Sandelowski, 2011). Employing a case study approach for the present study was fitting because of its particularistic nature. That is, the focus of this study was on a particular population (i.e., a family with a child aged 5-14 years with a confirmed diagnosis of ASD and their family canine) (Stake, 1995). Stake (1995) identified three different types of case studies:

- 1) Intrinsic (used when the intent is to better understand that particular case. It is not undertaken

to represent other cases or generalize a problem); 2) Instrumental (the purpose of the case is to facilitate understanding about something else outside of the case; it provides insight into an issue or refines a theory. The case is of secondary interest); and 3) Collective (involves more than one case; multiple cases are under study). Because the focus of this study was on multiple cases (6 families impacted by autism with a companion canine), this study is considered a collective case.

Due to the exploratory nature of my research, the use of a case study was well suited given that this approach is found to be most appropriate for exploring new processes, of which there is little understanding (Baxter & Jack, 2008). Case studies also enable researchers to concentrate on the experiential knowledge of the case while paying close attention to the influence of its setting and social contexts (Stake, 1995). For children with autism, the family system is the most important influence impacting how children develop, behave, and perceive their environment (Cridland et al., 2014). When families integrate a canine companion into their home and view the canine as a family member, the family canine becomes a sub-system within the complex family system (Jalongo, 2015). From this perspective, family canines become nested within the family social system and thus within my case. Therefore, in order to gain an in-depth understanding of the child-canine bonding process I needed to investigate the experiential influences from within the family system in the setting of their home as part of my case, rather than in isolation from the family.

3.2 Case Selection

Case study research is a qualitative approach in which the researcher explores a bounded system (a case) or multiple bounded systems (cases) through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents and reports), and reports case descriptions and case-based themes (Creswell,

2007). In order to ensure specificity for my study (i.e., that families met pre-specified criteria), each case consisted of: 1) a family with a child aged 5-14 years with a confirmed diagnosis of ASD; 2) and their family canine. The child must have been receiving or had received autism funding which, according to criteria established by British Columbia's Ministry of Children and Family Development, requires a confirmed diagnosis of autism by a qualified specialist (i.e., paediatrician, child psychiatrist, or registered psychologist). The proposed levels of ASD severity were chosen due to the increased ability for children diagnosed with level 1 or 2 ASD to engage in verbal and nonverbal communication and comprehend social overtures (American Psychiatrist Association, 2013).

The inclusion of a family canine who had not received specialized therapeutic training (as a service or a therapy canine) was established for this study as families, unwilling to be put on a wait list (recall that there is currently an 18-24 month waiting list for a service canine in British Columbia) and/or unable to afford a trained service canine (costs of a trained service canine run \$18,000 CDN; Canadian National Service Canine, NSD, 2012), often seek canine therapeutic support via less formal channels. Therefore, family canines were restricted to companion pets with no formal therapeutic or service training as this was determined to be representative of a typical family's experience. The above-described criteria adhere to the specificity requirements for a case to be considered a bounded system (Creswell, 2007)

3.3 Data Collection Procedures

In qualitative research, the researcher is most commonly considered the primary instrument for data collection, analysis, and interpretation (Paisley & Reeves, 2001). In this study, three main data sources were used to gather information related to the research questions: 1) semi-structured interviews with the parent(s); 2) field notes; and 3) observations of child-

canine interactions. In case study research, multiple rather than single methods of data collection are employed (Creswell, 2007) to facilitate the full exploration of a phenomenon within a particular context (Baxter & Jack, 2008). “This ensures that the issue is not explored through one lens, but rather a variety of lenses which allows for multiple facets of the phenomenon to be revealed and understood” (Baxter & Jack, p. 544). The strategic use of multiple sources of data is referred to as triangulation (Mills, 2003). Sources of data used for triangulation in this study included semi-structured interviews with the parents, observations of child-canine interactions, and field notes, and collection of artifact that represented the child-canine relationship (e.g., photographs and videos of the child interacting with the canine companion). The advantage or strength of triangulation is that it affords opportunities to compare and cross-validate findings derived from distinct data collection methods (Creswell, 1998). Furthermore, triangulation helps to safeguard against distortion and bias by using multiple data sources thus strengthening the credibility of subsequent claims that arise (Merriam, 2001). Because case study research seeks direct engagement with the social world and in-depth investigation through interviews, observations, and examination of artifacts (Gomm, Hammersley, & Peter, 2000), an intimate examination of the dynamic relationship between the child, the canine and the family was enabled through case study research.

3.4 Research Sample

3.4.1 Recruitment Procedures and Consent

Six families meeting the specified criteria for participation in this study were purposively selected. The proposed sample size for this study was determined based on recommendations by Guest and colleagues (Guest, Bunce, & Johnson, 2006) that “a sample of six interviews may be sufficient to enable development of meaningful themes and useful interpretations, especially

when group differences are not sought” (p. 78). Furthermore, case studies that use more than one method of data collection require fewer cases (Mason, 2010). In the end, the optimal number of cases is determined when saturation is reached - the point at which new information or themes observed in the data do not add anything to the story (Mason, 2010). Strauss and Corbin (1998) concluded that the longer the researcher examines, familiarizes and analyzes the data there will always be the potential for the new to emerge. Therefore, saturation should be more concerned with reaching the point where “the newly discovered” does not add anything to the overall story. As Mason (2010) suggests, it is the point when continued analysis of the data does not generate additional findings or insights about the particular research questions.

3.4.2 Participant Recruitment

In compliance with university ethics, parents provided written consent to participate and children provided verbal assent. Participating families received a \$30 cash honorarium as an incentive for their participation. Families were recruited from within the municipality of a mid-sized western Canadian city. To ensure that the majority of canine-owning families had an equal chance to participate in this study, flyers were posted at the eight on/off leash canine parks throughout the city for four weeks. These flyers were, in turn, circulated via social media by both the researcher and via informal sharing by the public (e.g., photos of flyers were posted on autism support groups on Facebook; see Appendix H). Interested individuals e-mailed the researcher to receive a document outlining and describing the research project and its aims (Appendix G). Individuals were then invited to contact the researcher via email or telephone, at which time, they were screened for eligibility and invited to participate if they met eligibility criteria.

The first six families meeting eligibility criteria were then invited to participate in the

study. Prior to scheduling the interview, a pre-visit was offered to each family. The pre-visit was offered in order to provide an opportunity for introductions and build rapport between the researcher and each participating family. Although the option to schedule a pre-visit was given, each family respectively declined as each felt it was unnecessary. Next, a time and date were scheduled to capture a representative or typical experience during which the interview could be conducted and observational data collected.

3.4.3 Interviews

The primary form of data collection was in-depth, semi-structured interviews with the parent(s). Conducting these interviews in a semi-structured fashion ensured that all participants were asked the same questions so that a cross-comparison of all participants' responses could occur which helped generate particular patterns of information and significance. Semi-structured interviews allowed the researcher to be guided by a list of questions and topics that could be explored based on the participant's responses without necessarily following the exact wording of the interview questions (Merriam, 2009).

All of the interviews were conducted in the participants' homes. The interviews were conducted individually in a single session with the participants choosing a time that was most reflective of a typical family experience. To collect descriptive information, a brief questionnaire was administered to parents prior to the interview in order to obtain demographic information regarding their family, their child's ASD diagnosis, previous experience with animals, and information about their companion canine (see Appendix E).

The interviews lasted, on average, 40 minutes (i.e., *range* = 27 - 64 minutes). It was expected that the interviews would vary in length due to differences in the child-canine relationship and how this relationship was situated within the family. In addition, some

participants spoke at length when prompted whereas in 4's case, a variety of questions and approaches to address topics were used due to these participants providing brief responses. In the six interviews, the participants' child/ren with ASD were present. In five out of the six interviews, the child's siblings were also present. The children were free to participate and contribute to the interview if they wanted to, however interview questions were directed primarily to parents not children.

The interviews began by asking the participants to read the informed consent forms (Appendix A, B, C and D) with the researcher, which described the research project and the procedures that insured confidentiality and anonymity of the data collected (the form was also sent by e-mail prior to the meeting). A verbal overview of each form, highlighting that participation was voluntary and that participants had the right to withdraw from the study at any point and could elect to withdraw some or all of the information they provided without any consequences was then provided. Signed consent was obtained for participating in the interview and for allowing the interview to be audio-recorded (Appendix A) and verbal assent was obtained from the child/ren with ASD for participating in the study (Appendix C). Additional consent forms (Appendices B & D) were provided for other participants who might be present during the study (e.g., siblings, grandparents, and friends). None of the participants declined to participate in the study or to have the interviews audio-recorded.

3.4.4 Field Notes

Field notes were recorded immediately following each interview. This provided an opportunity for the researcher to reflect and include additional information regarding the interview process, characteristics of the child, characteristics of the companion canine, characteristics of the family unit, and any additional information offered by the participants (i.e.,

one family discussed the need for the school system to allow children with ASD be accompanied by their companion canine in the classrooms). Field notes were also recorded during the collection of observational data. Observational field notes consisted of highly descriptive information and were completed throughout the interview process and immediately following the observations.

3.4.5 Observations

Observation, unlike other research methods, does not depend on the research participant's ability to understand or produce speech; therefore, as a research method, the use of an observational case study was well suited for gathering data on children with autism who may have limited verbal communication skills. Observational data collected at one time point consisted of observing child-canine and family interactions. Throughout this process, the researcher was an active participant, interacting with the other participants as part of the interview process. Observational data of child-canine interactions was unstructured and representative of a typical experience shared between the child, the companion canine, and the family unit. Observational data was gathered prior to, during, and following the interview, recording participant actions and behaviours (e.g., family interactions, canine behaviour, and child behaviour). Observational data also included artifacts (e.g., photographs and videos of the canine) presented by the child/family.

As suggested by Kutsche (1998), observational data begins by first mapping out the setting (Appendix I). Mapping out the setting for this study included a count of attendees, a physical map of the interview setting and description of the physical surroundings, a description of the canine companion being observed, a description of the child with ASD, and a description of the activities being observed, detailing activities of interest. Observations were documented

using field notes.

3.5 Data Analyses

Data analysis is a process that involves moving back and forth between concrete data and abstract concepts, as well as between description and interpretation (Merriam, 2009). In order to address the two research questions driving this study, notably, “What features of Bowlby’s attachment theory are evident in the child-canine bond?” and “What are the themes characterizing child-canine bonding?”, a two-step process of data analysis was used.

The first step in the process of analyzing the data involved transcribing the digitally recorded interviews and observation field notes into usable data. The transcribed data was then transferred to electronic documents and stored in the researcher’s computer as Microsoft Word™ documents. The transcribed data was then converted from word format into rich text file format in order to process and store them as NVivo™ (a software program specifically designed for qualitative data analysis) document files and use NVivo’s rich text and visual coding features.

During the transcription process the researcher examined the data for patterns and preliminary notes were made as to potential codes. Following transcription, a detailed reading and re-reading of the transcript for each case was conducted in order to become familiar with the data (Sandelowski, 1995; Spradley, 1979) and identify global or general themes from each data source that addressed the research questions.

The second step in analyzing the data involved a more exhaustive process. In order to complete a more in-depth analysis the researcher first examined what, if any, features of attachment were prevalent in the child-canine bond using directed content analysis. Then, the researcher sought to identify what personal and external factors influenced the child-canine bond and what interactions between the child, the family canine, and the family facilitated a strong

child-canine bond using conventional content analysis. In the following sections, both conventional and directed content analysis are described.

3.5.1 Analysis of Attachment Theory Using Directed Content Analysis

In order to identify what, if any, features of attachment were prevalent in the child-canine bonding process, Bowlby's (1969, 1979, 1988) attachment theory was used to help focus these particular research questions (e.g., questions regarding proximity maintenance, separation anxiety, safe haven, and secure base). Using this existing theory allowed the researcher to ask open-ended questions followed by targeted questions about the predetermined categories of safe haven, secure base, separation anxiety and proximity maintenance. Given that a strong theoretical framework does exist about this particular phenomenon, directed content analysis was used to analyze this section of the research study (Hickey & Kipping, 1996).

Using directed content analysis, findings across case studies were compiled to identify what, if any, components of attachment theory were evident in the child-canine bond. The findings from using directed content analysis offer supporting evidence for a theory (Hsieh & Shannon, 2002). Using Bowlby's attachment theory, the researcher began by identifying key concepts as initial coding categories (Potter & Levine Donnerstein, 1999). Next, definitions for each category were determined using Bowlby's attachment theory (Hsieh & Shannon, 2002). Bowlby's four features of attachment served as a framework to identify what features of attachment were prevalent in the child-canine bond within and across cases.

Coding began immediately with the predetermined codes (i.e., proximity maintenance, separation anxiety, safe haven, and secure base). First, each case was analyzed individually ($N = 6$) and coding frequency for each of the predetermined categories was counted using NVivo™. Finally, a cross case analysis was done where the number of codes from each category were

combined and a composite score was tallied (see Table 6).

3.5.2 The Identification of Emerging Themes Using Conventional Content Analysis

Given that existing theory and research literature on human-animal bonding in children with autism is limited and that themes describing the child-canine bond have not previously been identified in educational or psychological literature, conventional content-analysis was used to identify the personal and external factors influencing child-canine bonding including interactions between the child, the family canine, and the family unit. Conventional content analysis involves a “systematic classification process of coding and identifying themes or patterns and is used to make sense out of participant generated data” (Hsieh & Shannon, 2005, p. 1278). Given the dearth of empirical work on child-canine bonding in children with ASD, this approach offers advantages over other content analysis approaches (e.g., directed content analysis where predetermined thematic categories derived from prior research are used).

Using conventional content analysis, an individual case analysis was completed for each of the six cases in which initial global themes were developed. Identifying the prevalent themes was done in two stages. First, each transcript from each case was reviewed independently by both the researcher and her supervisor, who identified general or global initial themes (e.g., canine acquisition, canine as family member, family profile). These themes were pooled across raters and resulted in 32 general or global categories. The second step involved a winnowing process (Wolcott, 1990) whereby global themes were discussed by raters and collectively grouped into thematic categories. This was done to reduce redundancy (e.g., “change to child behavior” and “benefits to child” were merged). This process resulted in a mean of 9 themes.

Following the completion of an individual case analysis for each of the six cases, a cross case analysis was then done. Using the identified themes from each individually analyzed case,

the cases were then compared to determine if there were similar patterns and themes among them. These themes were then used for within and between case study comparisons in order to identify commonalities and differences. This process resulted in a total of 7 themes.

Descriptions and examples of each theme were identified and listed next to the theme (e.g., theme = canine as family member; description = treatment of canine as part of the family unit; examples = allowed on furniture, permitted to sleep on the child's bed, travels with family; see Table 7). Finally, an individual case analysis was completed using the 7 themes to identify the presence or absence of each theme within the individual cases (see Table 8).

3.5.3 Ensuring the Fidelity of the Study

In order to maintain the fidelity of this study, Tracy's (2010) eight "big-tent" criteria for excellent qualitative research was used which includes the following end goals of high-quality qualitative studies: worthy topic; rich rigor; sincerity; credibility; resonance; significant contribution; ethical; and meaningful coherence. Each of these markers of quality is described in Table 1.

Table 1
Criteria to Conduct High-Quality Qualitative Research

	Criteria	Execution in Design
1.	Worthy Topic	A <i>worthy topic</i> for this study was ensured by being interesting, relevant, timely, and significant . My study sought to examine and identify how children with autism bond with their canine companion. This is an interesting, relevant, and timely area of study – to date, few studies have examined how children with autism bond with their canine companion and the process through which this bond occurs remains largely unexamined. "Studies of little-known phenomena or evocative contexts are intrinsically interesting" (Tracy, 2010, p. 841). Additionally, this study has potential for significant practical and theoretical implications. This research holds promise to inform researchers about the nuanced interactions taking place within family contexts that facilitate child-canine bonding as well as the potential to inform parents who are seeking to support their children through the addition of a companion canine.

2.	Rich Rigor	High-quality qualitative research is marked by descriptions and explanations that are rich. Richness is generated through a variety of theoretical approaches, data sources, contexts, and samples. This study exemplifies <i>rich rigor</i> through the thorough review of the literature that is presented. The rigor of this study extends beyond the rich review of literature to the way in which the researcher adapted to the complexity of the research topic by including a variety of data collection methods (e.g., semi-structured interviews, observations, and field notes). In addition, the sample and context of the study is appropriate given the goals of the study. Furthermore, the researcher has familiarized herself with the theoretical approaches suitable for this study. For example, in order to conduct a study examining what personal and external factors might influence the child-canine bonding process, this study required insights from attachment and family systems analysis as well as the flexibility offered via case study methods.
3.	Sincerity	<i>Sincerity</i> in this study was ensured through self-reflexivity . Self-reflexivity, one of the most important practices of qualitative research, is the act of being honest with one's self, one's research, and one's audience (Tracy, 2010). Reflexive researchers are aware that they are bringing their own beliefs and experiences to the research project (Rinaldi, 2013). Throughout this research project, the researcher recognized that her presence and behaviour affected participants responses therefore, influencing the findings. Therefore, the researcher was mindful of her impact and noted other's reactions. Transparency , being honest about the research process, was ensured through keeping an audit trail, documenting all research decisions and activities.
4.	Credibility	<i>Credibility</i> was achieved in this study through thick description and triangulation . Thick descriptions were ensured through the data collection process and the description of findings in sufficient detail so that the audience can evaluate the extent to which the conclusions drawn are transferable to other people in similar contexts. Rather than telling the reader what to think the researcher showed the reader by providing the audience with enough detail so that they can come to their own conclusions about the case(s), through text data, direct quotes, and artifacts presented by the participants. Triangulation was accomplished by using multiple sources of data which allowed for different facets of problems to be explored, deepened understanding, and encouraged consistent interpretation (Tracy, 2010).
5.	Resonance	<i>Resonance</i> refers to the ways in which a research study resonates with an audience (Tracy, 2010). Resonance is achieved when readers feel that the research story overlaps with their own situation. A key path to resonance is aesthetic merit (Tracy, 2010). The researcher attempted to construct the text aesthetically by narrating the findings. Qualitative narratives should aim to be vivid, engaging, and structurally complex, or, in short, a story that moves the "heart and belly" as well as the "head" (Bochner,

		2000). Resonance also emerges through transferability , meaning that the study has potential to be valuable in similar contexts or situations. For families who are impacted by autism, it is hoped that the findings of this research holds potential to inform parents seeking to support their children through the addition of a canine companion. As I engage with the write up of the research report, I will be reflective as to who my audience is so that my research findings resonate with the readers.
6.	Significant Contribution	It is hoped that this study will make a <i>significant contribution</i> to literature in the field of HAI by addressing research questions that were ultimately driven by the identified gaps in the literature. The case study methodology builds upon prior survey research examining child-canine bonding and offers unique advantages for identifying the salient characteristics of children, canines, and families which contribute to successful bonding. In addition, given the relative lack of research in the area of human-animal bonding for children with autism, it is hoped that this research will not only provide insights but also stimulate more questions and inspire future research topics.
7.	Ethical	To ensure that this study was <i>ethical</i> , procedural, situational, relational, and exiting ethics were considered. Procedural ethics were met by seeking ethics approval from the University of British Columbia. Participants were informed about the aim of the study and any potential consequences of participating in the research study, as well as understood that their participation was voluntary. In order to participate in the study, parents provided written informed consent and children provided verbal assent. As a method of procedural ethics, all data collected for this study was stored in password protected files and locked cabinets. The researcher engaged in reflexive journaling as data collection and analysis commenced in order to address situational ethics. In consideration of relational ethics, the researcher ensured that her interactions with research participants demonstrated reciprocity and mutual respect. To address exiting ethics, the researcher ensured that the participants' remained anonymous in the write up of the results.
8.	Meaningful Coherence	<i>Meaningful coherence</i> means that a study's research design, data collection, and analysis are eloquently interconnected to the theoretical framework and situational goals of the study (Tracy, 2010). In an effort to identify factors that might influence the bond between a child with autism and their canine companion, an attachment and family systems analysis was employed in this study. The use of these two theoretical frameworks guided and supported the study, helped determine appropriate research questions, and gave direction to interviews and discussions to focus the research.

CHAPTER 4 – RESULTS

The purpose of this multiple case study was to understand child-canine bonding with a focus on identifying the factors contributing to bonding in children with ASD and companion canines. Multiple case studies provide an opportunity to examine the phenomenon of child-canine bonding in children with ASD by exploring the differences and similarities that occur among each case and identifying how they are situated within their respective family context. Recall that there were two research questions guiding the study: 1) What features of Bowlby's attachment theory are evident in the child-canine bond? and 2) What are the themes characterizing child-canine bonding?

This section will first provide an overview of the demographic characteristics of participants including demographics of the families and companion canines, followed by a description of each child's attachment to his/her companion canine. Next, a report on the findings that support the first research question, including prevalence and examples of participants' responses corresponding to each of Bowlby's four features of attachment, will be addressed. Following this, across-case findings addressing the second research question will be presented.

4.1 Demographics

4.1.1 Family Demographics

Data were collected from 6 participating families. Participants included in the analysis totaled 8 parents of children with ASD (see Table 2 and 3). In cases 1 and 5, both parents were present for the study (mother and father). In the remaining cases only one parent was present. Parents ranged in age from 44-38 years with a mean of 40 years. Out of the eight parents, five were female and three were male. Each parent had at least some university or college education.

The racial and ethnic background of parents included five Caucasian and one Aboriginal/Caucasian. Children with ASD ranged in age from 12-6 years with a mean of 8.62 years ($SD = 2.62$). The racial and ethnic background of children included seven Caucasian and one African American. Two families (4 and 5) had two children with a confirmed ASD level 1 diagnosis. The remaining four families had only one child with a confirmed ASD diagnosis. One family (1) had a child with a level 2 ASD diagnosis and all other families had a child with a level 1 ASD diagnosis.

Table 2
Family Demographics

Participant(s)	Birth Year	Gender	Ethnicity	Marital Status	Education	Occupation	Language
1	1977	F M	Caucasian/Aboriginal	Married	College Degree	Real estate agent	English
2	1977	M	Caucasian	Married	Undergraduate Degree	Student	English
3	1975	F	Caucasian	Married	Master's Degree	Doctoral Candidate	English
4	1974	F	Caucasian	Married	College Degree	Stay at home	English
5	1975	F M	Caucasian	Married	Other: Some University	Flight attendant	English
6	1971	F	Caucasian	Married	Undergraduate Degree	Business owner	English

Table 3
Demographics of Children With and Without Autism Spectrum Disorder

Participant	Number of Children	Age	Gender	Ethnicity	Diagnosis	Medication Use	Type of Medication
1	2	6	M	Caucasian	ASD- Level 2	No	NA
		NA	M				
2	2	12	M	Caucasian	ASD- Level 1	Yes	Intuniv Pasconal
		NA	M				
3	2	5	M	Caucasian	ASD- Level 1	No	NA
		5	M				
4	4	10	F	Caucasian	ASD-	No	NA

		12	M		Level 1 ASD- Level 1		
		NA	NA				
		NA	NA				
5	2	7	F	Caucasian	ASD- Level 1	No	NA
		9	M		ASD- Level 1		
6	2	8	F	Black	ASD- Level 1	No	NA

4.1.2 Companion canine Demographics

Five of the six families owned one companion canine and one family owned three companion canines. Case 1 owned three companion canines however, they only included their two bull canines in the study as their third companion canine was very elderly and had no particular attachment with their child with ASD. In the six families, there were a variety of breeds identified as seen in Table 4. All of the companion canines included in the study were small-medium sized breeds and ranged in age from 14 weeks to 10 years ($SD = 4$ years). Four out of the six companion canines were bought from a breeder. The remaining two companion canines were bought from a local animal shelter. Length of time that each family owned the companion canine ranged from 4 weeks to 8 years ($SD = 3.57$ years).

Table 4
Demographics of Companion canine(s)

Participant	Number of Canines	Bought From	Breed	Age(s) in years	Length of Time Owned (in years)
1	2	Breeder	English Bullcanine	1	1
2	1	Breeder	Miniature Golden Doodle ($\frac{3}{4}$ Poodle & $\frac{1}{4}$ Golden Retriever	2	1.5
3	1	SPCA	Black Lab/Border Collie	7	7
4	1	SPCA	Pomeranian/Chihuahua	10	8

5	1	Breeder	Australian Labradoodle	14 weeks	4 weeks
6	1	Breeder	Havanese/Bichon	10 months	8 weeks

4.1.3 Child-Canine Attachment Level

Each participating family completed a self-assessment of child-canine bonding in response to the statement: “How attached is your child with ASD to your canine (Not very attached; Attached; or Very attached)?” Each participating family was also instructed to answer a question in the demographic survey regarding the age of the child(ren) when the companion canine(s) was brought into the family home (see Table 5).

Table 5

Child-Canine Attachment Level

Participant	Age of Child when Canine was Bought	Attachment between Child with ASD and Companion canine
1	5	Very Attached
2	9	Very Attached
3	N/A (prior to birth of children)	Attached
4	2 (F) & 4(M)	Attached
5	7 (F) & 9(M)	Very Attached
6	8	Very attached

4.2 Support for Bowlby’s Attachment Theory

One of the guiding questions in this research study was whether the child-canine bond in children with ASD could be conceptualized as an attachment relationship and to what extent these features of attachment are evident. Table 6 illustrates the extent to which each component of attachment is evident in each individual case which is then followed by a total score where each category is combined and a composite score is tallied.

Table 6

Features of Attachment Evident in the Child-Canine Bond

	PROXIMITY SEEKING	SAFE HAVEN	SECURE BASE	SEPARATION ANXIETY
--	------------------------------	-----------------------	------------------------	-------------------------------

1	X 11	X 3	X 2	X 2
2	X 7	X 5	X 4	X 2
3	X 3	X 3	X 4	X 0
4	X 2	X 3	X 2	X 2
5	X 7	X 2	X 0	X 4
6	X 7	X 1	X 2	X 1
COMPOSITE SCORE =	37	17	14	11

In the following section, each feature of attachment will be discussed (from the most prevalent to the least prevalent).

4.2.1 Proximity maintenance

Proximity maintenance is a key component of an attachment relationship and is characterized by a child's desire to be near to the attachment figure and the attachment figure's physical proximity and accessibility are enjoyable (Ainsworth, 1991). For this study, proximity maintenance refers to the extent to which a child with ASD maintains proximity to the companion canine and was identified as being the most prevalent feature of attachment in the child-canine relationship.

4.2.1.1 Evidence from Parents

In each family (cases 1-6), the parent(s) shared that their child(ren) with ASD enjoyed the accessibility and physical nearness of the companion canine(s). The following statements are illustrations of proximity maintenance as described by parents during the semi-structured interviews.

In this particular section of the interview with case 1, the parents were describing the temperament of their two bull canines and how tolerant these canines were of their son's (ChildOne) multiple behaviours (e.g., squeezing, pinching, and laying on the canines). As the conversation continued, they both commented on how, for the first six weeks, ChildOne initially

did not display any interest in the canines and would actually avoid any physical contact with them. Much to their surprise, ChildOne's parents proceeded to remark that one day, a drastic change in their son's behaviour towards their two bull canines occurred and since then, they have become inseparable.

It went from wanting nothing to do with the canines to inseparable. After six weeks it was all of a sudden, it was like a light switch turned on with ChildOne and all of a sudden he follows them around, he pinches them and he wants to be with them all of the time. One day he wanted nothing to do with them and the next day he won't stop following them around (1).

In case 6, the mother discussed how her daughter had an immediate bond with the companion canine saying "she bonded right away, the first day we got him she calmed him and fed him. He was in her arms right from the get go and pretty much never left her arms since."

In Bowlby's (1979) description of proximity maintenance, a child's desire to maintain close proximity to the parental figure is because he or she provides a sense of safety and security. This feature of proximity maintenance was also depicted in the child-canine relationship.

Sometimes when he needs to talk things through he still wants the canine there...The canine kinda needs to be there for him to have the physical comfort...When he is distressed and doesn't have anything to discuss he will just go and sit with CanineThree...He likes to keep CanineThree close to him as much as possible (2).

Proximity maintenance is also characterized by seeking out behaviours. In case 5 the parents explain how their two children with ASD continually seek out their companion canine:

First thing ChildSix and ChildSeven do when we pick them up from school is seek out

CanineSix... They just love him! First thing they do when they get in the car from school is say “oh hi CanineSix!” First thing in the morning they will look for CanineSix. They are VERY attached.

Although proximity maintenance was identified as the most salient feature of attachment in the child-canine relationship, in two cases (3 and 4) the parents did not report that their child(ren) with ASD would purposefully seek out or maintain physical nearness to the companion canine. For example, in case 3, the mother described her son’s relationship with the companion canine as ‘fine’ however, there was “nothing to indicate that he has some sort of special bond with CanineFour.” In case 4, the mother explained that although her two children with ASD are “always happy to see CanineFive, there are no issues with the canine not being there.” Observational data collected by the researcher corroborated these findings from case 3 and 4 with no behaviours reflecting proximity maintenance observed.

4.2.1.2 Evidence from Observation

Throughout the duration of the interviews, the researcher noted each child’s physical nearness to the companion canine in the observational map (see Appendix I). In cases 2, 5, and 6 each child maintained close proximity to their companion canine and appeared to make a conscious effort to engage with their companion canine. Interactions consisting of ongoing play, cuddling, grooming, and obedience training throughout the interview process with each child’s parent(s). In case 1, ChildOne engaged with the companion canines often moving back and forth between the canines and other interests (e.g., tech-driven games). These interactions continued and it appeared as though ChildOne would consistently refer to them for physical comfort and reassurance in between other activities.

The researcher did not observe behaviours reflecting proximity maintenance in cases 3 or 4.

In each case, the children with ASD appeared to be accustomed to their canines presence however, did not seek to actively engage with their canine.

4.2.2 Safe Haven

Safe Haven is another essential feature of an attachment relationship and refers to the extent that the children with ASD turn to their companion canine for comfort when distressed. Following proximity maintenance, safe haven was the second most prevalent feature of attachment evident in the child-canine relationship. In each case it was identified that the companion canine provided comfort to the children with ASD during times of emotional upset and distress.

4.2.2.1 Evidence from Parents

When he is feeling stressed he seeks comfort from them. I think when he is feeling stressed or anxious he gets those stemming behaviours and that is when the pinching of CanineOne and CanineTwo come into play (1).

CanineThree is very comforting for ChildTwo when he is upset, I've noticed a lot more emotional regulation happens when CanineThree is present. He is able to navigate his feelings a little more and express and ask for what he needs (2).

During the interview with case 6, the child with ASD (ChildEight) was present and free to participate in the discussion. At one point during the conversation ChildEight proceeded to tell the researcher that "CanineSeven is very comforting. He cuddles me. When I feel lonely I will go find CanineSeven."

4.2.2.2 Evidence from Observations

An important feature of the child-canine bond was close physical contact. This coincides with the attachment features of proximity maintenance and safe haven where close physical

contact is enjoyable, purposefully sought out and provides a source of comfort. Cuddling, kissing, skin-to-skin contact, extended mutual gazing is characteristic of the infant-caregiver relationship (Hazan & Ziefman, 1994). Although Hazan & Ziefman (1994) clearly state that these behaviours are restricted to the infant-caregiver and romantic relationships, these behaviours have also been exhibited in studies examining the human-canine bond (e.g., Beck & Madresh, 2008; Kurdek, 2008; Kwong & Bartholomew, 2010). In the current study, the researcher identified that physical contact behaviours characteristic of an attachment relationship also occurs freely in the child-canine bond in children with ASD. These behaviours were both observed as well as noted by some of the participating parents.

... Since you've been here, he's probably looked at you twice, which is obviously the social aspect. But with these canines, he will stare at them for longer than he will actually stare at us...For him, he has a lot of sensory issues so for him to kiss the canines is huge. When I give him a kiss he wipes my kisses off but with the canines he never wipes the kisses off (1).

There is a lot of petting, a lot of hugging, a lot of cuddling, a lot of time! He likes to keep CanineThree close to him as much as possible...Mainly he plays and cuddles him. Especially at bed time, when he goes to bed CanineThree will go cuddle up with him in the bed while he falls asleep (2).

4.2.3 Secure Base

Secure base, the third most prevalent feature of attachment evident in the child-canine relationship, refers to the extent that children with ASD perceive their canine as a dependable source of comfort and support. This felt security provided a base for the children with ASD to explore the environment and engage in typical interactions that otherwise might be stressful

them.

4.2.3.1 Evidence from Parents

Secure base was identified in five out of the six cases. In case 5 however, secure base was not identified at the time of the interview perhaps due to the fact that this participating family acquired their companion canine less than four weeks ago. In the remaining cases, it was clearly indicated that the children derived a sense of security from their companion canine. For example, in case 1, the parents explained the positive impact the canines have had on their son's willingness to engage in social interactions. "I think with ChildOne, just the sense of familiarity, it makes him feel at ease in social situations. He will be calmer longer if the canines are around."

When the researcher asked participating families how the companion canine has influenced their child's willingness to engage in otherwise stressful situations, some of the participating families indicated that their child's(ren's) relationship with the companion canine has enabled them to engage more fully with the world and feel more confident about their abilities.

In the last year we have seen a lot more of an ability to ask and communicate needs rather than get to the point where he can't anymore... We have noticed more of a willingness to engage in general, there has been a general improvement that is definitely related to CanineThree (2).

Oh yes, I would say especially in social interactions. When people come to the house it is that topic starter and something that everyone has, that common ground to interact because people will ask questions about the canine so if we are meeting someone new or whatever, CanineFive can do that (4).

4.2.3.2 Evidence from Observations

The most evident depiction of secure base was each child's willingness to engage with, and eagerness to introduce their canine, to the researcher. For instance, in case 3, the researcher observed that when she first entered into the participating family's home, the son with ASD opened the door and immediately introduced himself by saying "Hi! I am ChildThree, this is my brother, and this is our canine, CanineFour." ChildThree evidently identified himself through his family, which included their companion canine. This, in turn, appeared to deconstruct social barriers and increase his willingness to engage. During the interview, ChildThree's mother pointed out that:

Having CanineFour around to interact with has opened up ChildThree's interactions with other canines and being more comfortable in social settings...By having CanineFour, ChildThree has gotten used to being bumped, being touched, and hearing CanineFour bark loudly. The sort of things he would normally find disruptive.

4.2.4 Separation Anxiety

An individual's resistance to separation of an attachment figure and their experience of distress when separated are a reflection of separation anxiety. In the current study, separation anxiety was identified as the least prevalent feature of attachment evident in the child-canine relationship. Separation anxiety refers to the extent that the children with ASD miss their companion canine and become anxious when the companion canine is absent. When the researcher asked participating families how their child copes when separated from the companion canine only one participating family (case 2) provided an example of their child with ASD expressing behaviours consistent with separation anxiety when a part from their companion canine.

From an attachment theory perspective, separation anxiety serves to maintain an infant's proximity to the caregiver for protection and safety when he/she feels discomfort. When the researcher asked participating families how their child(ren) copes when separated from the companion canine(s), only one participating family (case 2) provided an example of their child with ASD expressing behaviours consistent with that of separation anxiety when separated from their companion canine. For example, case 2 reported that their son with ASD felt distressed when separated from his companion canine which is indicative of an attachment bond. "He does not handle it well, a couple of times we have gone on vacation, just the three of them...and he missed CanineThree quite a bit...He definitely gets distressed when he is away from CanineThree."

Separation anxiety was difficult to assess due to the fact that the children with ASD were seldom separated from their companion canine(s). For instance, in cases 1, 5 and 6, reports regarding separation anxiety were hypothetical as the children with ASD were either never separated from the canine or had separations for only a few hours (e.g., during school days). Four out of the six participating families (cases 1, 2, 5, and 6) treated the canine as an equally important member of the family and therefore, the canine would be included in day-to-day activities as well as family travel. This is illustrated in the following quotes.

It is a strong bond. He would miss those canines if they were not around. The canines are always with us though, there is not a time the canines are not with us and ChildOne, unless he is at school. If we go on vacation they always come with us and we haven't had a situation where they are not with us yet (1).

They are not really away from him (CanineSix) aside from school and I take him with me in the car...They (ChildSix and ChildSeven) can cope without him but

they miss him...But yeah, we haven't really been away from him. If anything were to ever happen to him though it would be devastating (5)!

In case 4, both the eldest daughter and eldest son were diagnosed with ASD however, there was no evidence (during the interview process or throughout the collection of observational data) indicating a typical expression (e.g., upset or distressed when away from the canine) of separation anxiety experienced by the son with ASD when absent from the companion canine. However, in the following statement by the mother in case 4, the researcher noted that perhaps his demonstration of separation anxiety was unique.

Thinking about their bond with him, children with autism, you may think something is a certain way but it isn't. There was a time we were thinking of rehoming CanineFive just because we thought it was too much to look after. ChildFive (their son with ASD) was so upset and it surprised us! We were like okay, this canine IS pretty special to him. Although our daughter shows more affection, doesn't necessarily mean she is more bonded to him. Our son has a more severe degree of ASD than her too.

As was mentioned earlier, separation anxiety, from an attachment theory perspective, focuses on how the dependent (the child) maintains close proximity to the caregiver in order to seek protection and security. Comparatively, separation anxiety that focuses on the dependent's needs is characteristic of a caregiving relationship where the caregiver seeks proximity to the dependent in order to provide protection and security. In case 4 the children experienced a form of separation anxiety suggesting that their caregiving system had taken precedence over the attachment system. For example, even though the children with ASD did not display typical separation anxiety behaviours when separated from their companion canine, the parents did

report that “they do recognize he is away because they will ask ‘who is with CanineFive, who is looking after him? I hope he is okay!’”

In this section of the chapter, the findings of this exploratory case study examining whether the child-canine bond in children with ASD could be conceptualized as an attachment relationship and to what extent these features of attachment are evident, are presented. Given that a strong theoretical framework does exist about this particular phenomenon, directed content analysis was used to analyze this section of the research study (Hickey & Kipping, 1996). The analysis revealed that the four features of attachment were evident in the child-canine bond indicating that children with ASD have the ability to form an attachment relationship with their companion canine. Proximity maintenance and safe haven were identified as being the most prevalent features of attachment while secure base and separation anxiety were the least prevalent features of attachment.

4.3 Themes Characterizing Child-Canine Bonding

The second research question addressed in this study was: What personal and external factors influence the child-canine bonding process in children with autism? Recall that the prevalent themes within each case were identified using conventional content analysis. Following the completion of an individual case analysis for each of the six cases, a cross case analysis was completed. Using the identified themes from each individually analyzed case, the cases were then compared to determine if there were similar patterns and themes among them. These themes were then used for within and between case study comparisons in order to identify commonalities and differences. Through the completion of the cross-case analysis, the researcher identified 7 major themes characterizing child-canine bonding (see Table 7). An individual case analysis was completed using the 7 themes to identify the presence or absence of

each theme within the individual cases (see Table 8) which are discussed in the following sections.

Table 7
Prevalent Themes, Coding Descriptions and Examples

THEMES		DESCRIPTION	EXAMPLES
CANINE ACQUISITION		Considerations made by family members when selecting a canine(s) that increase or decrease the likelihood of a strong child-canine bond	
	AGE OF CANINE	The age of the canine when introduced into the family home	Puppy versus adult canine
	PRE OR POST ASD DIAGNOSIS	Timing of decision to integrate a canine into the family	Prior to the child's/ren's ASD diagnosis or following the child's/ren's ASD diagnosis
	INTENTIONAL VERSUS OPPORTUNISTIC	Whether decisions and considerations regarding canine selection were carefully made versus flexible, open, and not driven by specific selection criteria (e.g., whether the canine was intentionally acquired or happened upon).	Specific considerations (e.g., breed, size, temperament, fit into family lifestyle, portability, durability, physical appearance) versus non-specific considerations (e.g., immediate availability at the local animal shelter, not breed bound)
BONDING STRATEGIES		Strategies that facilitated child-canine bonding	
	PRE-CANINE ACQUISITION	Strategies that facilitated child-canine bonding	Child is involved in canine buying process (e.g., following the breeder on social media, involved in selecting the puppy/canine, involved in naming the puppy/canine, preparing the house for the puppy's/canine's arrival)

	POST-CANINE ACQUISITION	Strategies that facilitated child-canine bonding	Canine is trained to sleep in child's bed, child is involved in training the canine/taking the canine to obedience classes, child is involved in canine husbandry (e.g., feeding, walking, grooming, and picking up after the canine), physical contact is encouraged (e.g., petting, cuddling, hugging)
	ONGOING	Strategies that facilitated child-canine bonding	Continued obedience training (e.g., ten minutes of obedience training per day at home), physical contact (e.g., petting, cuddling, hugging), playing with the canine, husbandry (e.g., feeding, walking, grooming, picking up after the canine)
CANINE CHARACTERISTICS		Behavioral and temperamental characteristics of the canine as described by the families	
	DESIRED	Characteristics contributing to a strong child-canine bond	Tolerant, reliable, gentle, patient, submissive, social, intuitive (e.g., responds to human emotions), high attachment ability (e.g., breed known for loyalty, ability to connect), affectionate, bombproof (e.g., accepting of multiple and unpredictable behaviors characteristic of a child with ASD)
	UNDESIRED	Characteristics detracting from a strong child-canine bond	Dominant, possessive, aggressive, insecure (e.g., shy, untrusting/fearful), disengaged (e.g., aloof), selective attachment (e.g., attachment geared toward a specific population such as a male adult)
CANINE AS FAMILY		Treatment of canine as part of	Allowed on furniture,

MEMBER		the family unit	permitted to sleep in the child's bed, travels with the family, incorporation into daily routine, normalization of canine (e.g., the canine is a normal part of the family's activities)
FAMILY PROFILE		Family characteristics contributing to a strong child-canine bond	
	CHILD PREVIOUS EXPERIENCE	Child with ASD had previous experience with animals	Accustomed to having other family pets (not limited to canines) and/or being around other family pets (e.g., neighbours and/or friends pets)
	PARENTAL KNOWLEDGE AND EXPERIENCE	Prior knowledge and experience with canines	Knowledge regarding breed specific behaviours and breed characteristics, research knowledge on the therapeutic benefits canines can have on children with ASD, and previous experience with canines (e.g., growing up with canines)
	MOTIVATION	Motivation to integrate a canine into the family unit	Parental and familial desire to integrate a canine into the family home is shared, the canine is intentionally acquired for the child with ASD, the child with ASD is motivated to get a canine (e.g., persistently asking for a canine, demonstrating responsibility for canine ownership such as saving up money for a canine bed, writing out a list of things he/she will do to take care of the canine, showing attachment behaviors towards other canines)
BENEFITS		Positive influences identified from presence of canine	
	TO CHILD	Positive influences identified from presence of canine	Developmental changes (e.g., increase in maturity, capability and responsibility), emotional regulation, other regarding (e.g., demonstration of

			empathy and care towards animals as well as peers), increased social interactions and communication, increased patience and tolerance (e.g. sitting quietly for long periods)
	TO FAMILY UNIT	Positive influences identified from presence of canine	Increased togetherness or cohesion of the family, increased social outings and activities, decreased level of stress experienced by the family due to a reduction in emotional outbursts.
	OTHER	Miscellaneous themes not fitting in categories above	<p>Incubation period – a period during which attachment is not immediately evident but is in development.</p> <p>Bi-directional effects, children with ASD may exhibit multiple and unpredictable behaviours (e.g., stemming, squeezing, pinching, yelling). These behaviours were tolerated by the family canines which evidently had a bi-directional effect where the children tolerated canine behaviours which normally would not be accepted from another human being (e.g., a child with ASD would wipe his face after his mother kissed him on the cheek however, he happily accepted kisses from the canines).</p> <p>No competing interests - though interest was evident in interacting with canines, other more attractive activities could usurp this (e.g., tech-driven games).</p>

Table 8
The Absence or Presence of Prevalent Themes within Individual Cases

	CANINE ACQUISITION			BONDING STRATEGIES			CANINE CHARACTERISTICS	
	AGE OF CANINE	PRE OR POST ASD DIAGNOSIS	INTENTIONAL VERSUS OPPORTUNISTIC	PRE CANINE	POST CANINE	ONGOING	DESIRED	UNDESIRED
1	Puppy	Post	Intentional		X	X	X	
2	Puppy	Post	Intentional	X	X	X	X	
3	Adult	Pre	Opportunistic			X	X	
4	Adult	Post	Opportunistic		X		X	X
5	Puppy	Post	Intentional	X	X	X	X	X
6	Puppy	Post	Intentional	X	X	X	X	

	CANINE AS FAMILY MEMBER	FAMILY PROFILE			BENEFITS OF CANINE		OTHER
		CHILD PRIOR EXPERIENCE	PARENTAL KNOWLEDGE & EXPERIENCE	MOTIVATION	TO CHILD	TO FAMILY	
1	X	X	X	X	X	X	X
2	X	X	X	X	X	X	
3	X				X	X	X
4				X	X		X
5	X	X	X	X	X	X	
6	X	X	X	X	X	X	

4.3.1 Canine Acquisition

Canine acquisition was a prevalent theme that emerged during the cross-case analysis and is described by the researcher as decisions that the families made when selecting a canine(s) that increased or decreased the likelihood of a strong child-canine bond. Throughout the researcher's semi-structured interviews with the parents and collection of observational data, three sub-themes related to canine acquisition were identified and included: 1) the age of the canine (puppy versus adult); 2) the timing of acquisition (pre or post ASD diagnosis) to integrate a canine into the family home; and 3) whether the decision to integrate a canine into the family home was intentional or opportunistic. In the following sections, support for each of these subthemes will be provided including participant comments and corroborating researcher observations.

4.3.1.1 Age of Canine

A prominent sub-theme that was noted by the researcher was the age at which the canine was introduced into the family home. An attachment relationship was more evident in the families who integrated the companion canine(s) into the family home when the canines were puppies, following their child's(ren's) ASD diagnosis (4/6 cases supported this). During the cross-case analysis, this subtheme became especially apparent to the researcher when differences in cases 3 and 4 emerged. In comparison to cases 1, 2, 5, and 6, where a stronger child-canine bond was evident, a lack of bond was evident in cases 3 and 4. This prompted the researcher to investigate potential explanations for this finding. Notably, in cases 1, 2, 5, and 6, the companion canines were acquired as puppies whereas in cases 3 and 4, the companion canines were either an adult by the time the child with ASD was born (case 3) or was acquired at an adult age (case 4).

4.3.1.1 Evidence from Parents

In case 3, the companion canine was acquired prior to the birth of their son with ASD and was an adult (2 years of age) at the time of their son's birth. Although the bond between the child with ASD and the companion canine was reported as "attached" the mother stated that there was "nothing that indicated ChildThree has some sort of special bond with CanineFour."

A weaker bond was also exhibited in case 4. In this particular family, the companion canine was adopted from the Society for the Prevention of Cruelty to Animals (SPCA) and integrated in to the family home at the age of two years. "He was not a young pup when we got him, he is ten years old but we got him eight years ago, so we got him when he was two years old." The mother did report that her two children with ASD were "attached" to CanineFive however, given his current age and personality, she pointed out the following:

I think it is a little tough for them to bond more with CanineFive...he is not overly playful...he is not the kind of canine you take the park and throw a Frisbee...If he was more playful and would run the ball to them I think they would be all over that. It is limited to a certain degree because of his nature and age.

4.3.1.2 Evidence from Observations

Throughout the interview process with cases 3 and 4, the researcher observed minimal interactions between the children with ASD and the companion canines. Rather than directly engaging with the canines, the children seemed distracted by other interests. In both cases, the children appeared to be accustomed to the canine's presence however, their actual engagement was minimal.

4.3.1.2 Pre or Post ASD Diagnosis

The timing when the companion canine was acquired into the family home was another prominent subtheme that correlated with the strength of the child-canine bond. It became evident that the children whose families had decided to integrate a canine into their home following their ASD diagnosis (post-ASD diagnosis) exhibited a stronger bond to their companion canine compared to those who integrated a canine into their home prior to their ASD diagnosis (pre-ASD diagnosis).

This was illustrated in cases 3 and 4 where an attachment relationship between the children with ASD and their companion canines were found to be least prevalent. As previously mentioned, case 3 acquired their companion canine prior to the birth of their son with ASD and therefore prior to his ASD diagnosis. Additionally, in case 4, their companion canine was acquired prior to their daughter's ASD diagnosis.

4.3.1.3 Intentional versus Opportunistic Canine Acquisition

Decisions and considerations regarding canine selection were evident in participants' responses to the researcher's questions during the semi-structured interviews (e.g., looking back to when you first brought (name of canine) home, could you tell me what drew you to getting (name of canine) versus any of the other canines you perhaps looked at? What or who influenced you to get a companion canine?). Two distinct pathways regarding the acquisition of companion canines emerged. Several of the families (cases 1, 2, 5 & 6) acquired canines through what may be considered intentional efforts (e.g., specific considerations, such as breed, size, and temperament, were carefully made). Alternatively, the remaining two families (cases 3 and 4) reported being more opportunistic regarding canine acquisition and selection (e.g., flexible, open and not driven by specific selection criteria). A trend between the strength of the child-canine

bond and the acquisition strategies used by the participating families' (intentional versus opportunistic) emerged.

A stronger child-canine bond was evident in the families who made intentional and careful decisions regarding canine selection. Intentional decision criteria included breed, size, temperament and physical appearance of the canine, and fit into family lifestyle and portability of the canine. In the following section, illustrations of intentional decisions regarding canine selection gathered from the interview data are presented.

We needed a canine that was great with kids. Bull canines are in the top ten canines that are best with kids. We had a really big big canine, a Leonberger, he was great with kids but so big and Joe did not interact with him, really at all. He was just too big... We wanted a canine that was great with kids, a sturdy canine. We have two boys and they wrestle. So temperament was important and yeah just good with kids. Temperament, personality and sturdiness... The bullcanine, no matter what you do, doesn't get angry or aggressive. You can do anything to them (1).

We decided on the Golden Doodle for the mixture of retriever temperament and poodle intelligence. We were looking for a breed that was known for unconditional attachment and ease of attachment and no aggression... We went with $\frac{1}{4}$ Golden Retriever and $\frac{3}{4}$ Poodle... a friend of ours has a full sized Golden Doodle and that is a big big canine, we were always concerned about the boys walking him so a bigger canine would have been a concern for us. CanineThree is a good size. 'He can sit on our lap when we call him!' Yes, as ChildTwo says,

he is like a lap canine (2).

We looked around at a lot of canines and I think that we really liked the red color, and size wise, we did not want anything too big or too dominating...we wanted something that was medium sized, so he will be 45 lbs which will be a nice size.

He is a lab and poodle so they brought down the size (5).

Five out of the six participating families stressed the importance of size, portability, and fit with family lifestyle. Large breeds appeared to present an obstacle from the child-canine bonding process with concerns of being overwhelming for the child with ASD as well as the overall family unit.

The last canine was too big, so the kids could not play with the canine. So that was the drive with this breed, something small, stinky, solid. Something that we could take with us camping, because we camp and we boat. ChildOne LOVES walking CanineOne on the leash, so a larger canine, you know, I wouldn't want a kid dragging down the street (1).

We didn't want a bigger canine. We didn't want to change our lifestyle...We wanted something that could still travel with us...we thought a smaller canine that could come with us is a little easier than a big canine. We didn't want a canine we would always have to walk and take outside (6).

Comparatively, case 3 reported that they were not driven by specific breed characteristics and were more elusive regarding the type of temperament they were seeking when they decided to integrate a companion canine into the family home.

We were primarily interested in getting a canine from the SPCA, rather than being focused on breed per say we were being opportunistic keeping an eye on what

was coming up... We were interested in a larger canine but not necessarily really large and there were some breeds that we were not very interested in due to reputation but we were fairly open to a mix of things (3).

Additionally, case 4 appeared to be more focused on canine availability rather than selecting a canine that would be suitable for a child with ASD.

When we went to the SPCA, we were having trouble finding one that was out in display so the SPCA worker went to the back and brought CanineFive in his arms. We were then like "oh he is so cute!" It was not the breed in particular he just looked like this ball of snow.

4.3.2 Bonding Strategies

In addition to canine acquisition, bonding strategies were also found to be a factor influencing the development of an attachment relationship between children with ASD and their companion canine. Bonding strategies emerged as the second theme identified across cases and are defined as strategies that appeared to facilitate child-canine bonding.

Discussions with the participating families included noteworthy dialogue around bonding strategies that were implemented to facilitate a strong child-canine bond. Five out of the six participating families indicated that they intentionally implemented strategies to help facilitate a bond however, the researcher also identified and categorized strategies that may have been unintentional yet appeared to contribute to the child-canine bonding process.

Strategies were categorized into three distinct phases and included strategies that occurred: 1) prior to integrating the companion canine(s) into the family home (pre-canine acquisition); 2) immediately following acquisition of the companion canine(s) (post canine

acquisition); and 3) continuing after a bond between the child with ASD and the companion canine had been established (ongoing).

4.3.2.1 Pre-Canine Acquisition

The cross-case analysis revealed that by involving the child with ASD in the canine-acquisition process helped encourage the development of an attachment relationship. Children with ASD often exhibit restricted, repetitive patterns of behaviour, interests, or activities that can be manifested as excessive adherence to routines or excessive resistance to change. Adding a companion canine into the family home will inevitably result in changes to daily routines and require an adjustment to the family system. For children with ASD, preparation for change is essential in order to facilitate smooth transitions and minimize disruptions. For the majority of cases, involving the participating children with ASD in the canine-acquisition process helped prepare them for these changes and increased their excitement about the addition of a companion canine.

In this study, child involvement included strategies such as frequent communication with the breeder, following the breeder on social media (e.g., the breeder's Facebook page where pictures of the puppies would be posted), and having the child with ASD help select the canine.

When it came to choosing the puppies we followed the breeder on Facebook and she would post pictures of them once a week...as the puppies got older I would ask the kids 'okay, which one catches your eye?'...It is so good for the kids though because every morning they would go to the breeder's website and every day she would post new pictures or videos so they really followed the process. We knew we were getting him before the mom was even bred yet. So we followed them since April (5).

We wanted the Havanese breed, we wanted a fluffy canine ...we were told to get a blend and we found the Havanese-Bichon ...so we all looked on the internet and found him on Kijiji...We got him from a breeder and we all went to get him. All of us (6)!

Other forms of involvement included having the child(ren) with ASD name the puppy/canine and help prepare the house for the canine's arrival.

Linda (ChildTwo's Mom) channelled his excitement and made him take some ownership, he had to save up money to help pay for a canine bed and he had to promise and he wrote out some things he would do with the canine and he's lived up to it. He did lobby for the canine and some responsibility attached to it (2).

4.3.2.2 Post-Canine Acquisition

The most common child-canine bonding strategies were strategies implemented following the acquisition of the companion canine. Post-canine acquisition strategies were strategies that the parents' intentionally put into action to help encourage child-canine bonding. Participants reported that close physical contact such as having the companion canine sleep in the child's(ren's) bed, was frequently encouraged.

We also set up, immediately after CanineThree was house trained he started sleeping with ChildTwo and stays for a while and then leaves...that is something we worked with CanineThree to do. It was trained, we trained CanineThree to do it (2).

Honestly, I would pick the bullcanines up and drop them on ChildOne's lap and ChildOne would squish them...there was no easing into it. We used to have the

canines go into his room and the canines would go in there and cuddle him as well.

It is all about cuddling and connection. When he sees them laying he will go curl up in there stomach, it is so sweet (1).

Post-canine acquisition strategies also included involving the child in the care of the canine (e.g., feeding, walking, grooming, and picking up after the canine) and taking the canine to obedience classes.

I think that is where encouraging him to help feed CanineFour because he has expressed interest in it and encourage him to hold the bowl and have CanineFour to sit. To always be encouraging his independence to complete tasks and feel good about it (3).

With me, when walking I would have ChildOne hold the leash and he really, he thought it was really cool, and of course me trying to read his mind being nonverbal, but you could just tell he thought it was really cool because he would look at the leash and then look down the line and see that he was holding CanineOne. So I think he thought it was really cool (1).

Also, ChildTwo walks CanineThree...And then, CanineThree has been through two rounds of obedience training, and ChildTwo and Linda (ChildTwo's Mom) did that together and we asked that ChildTwo be able to attend because they only wanted one owner and one animal, so they made the exception. We thought this would give him the opportunity to bond and work with CanineThree in the obedience setting (2).

4.3.2.3 Ongoing

Ongoing strategies included strategies that continued well after the companion canine was integrated into the family home and had become a part of the child's day-to-day routine. Ongoing strategies included: continued obedience training (e.g., ten minutes of obedience per day at home); physical contact (e.g., petting, cuddling, hugging); playing with the companion canine; and continued care of the companion canine (e.g., daily feeding, walking, grooming and picking up after the canine).

Normally in the morning they will play with him, take him outside...walk him to the tennis courts and to school and back. Because he is still a puppy the kids will follow him around to make sure he doesn't get in trouble. For the most part, it is just following him around, and they will obedience train him and teach him new tricks...They will play with him, feed him, and give him fresh water. "Whenever it is possible we play with him. Whenever he is not sleeping (5)!"

ChildTwo walks him five days a week and I encourage it on the weekends. If the boys go outside to play CanineThree will go out and they will play the ball for him ...A lot of playing. ChildTwo helps with poop pick up in the backyard and walking and the playing and a bit of the training.

4.3.3 Canine Characteristics

Canine characteristics emerged as the third theme in the cross-case analysis. Canine characteristics included age, size, and behavioural/temperamental traits. The families with older canines appeared to be less tolerant of physical touch from children and therefore less inclined to interact with them. Comparatively, the families with younger canines who were integrated into the home as a puppy appeared to happily engage with the child(ren), were more energetic and

playful, and more tolerant of multiple and unpredictable behaviours often exhibited by children with ASD. The families who had older canines in their home (i.e., cases 1, 3, & 4) exhibited avoidant behaviour and were less likely to engage with the children perhaps affecting the ability to establish an attachment relationship.

Size of the canine also emerged as a prevalent theme across cases. The importance of size was reported by each family. Large breeds appeared to present an obstacle from the child-canine bonding process with concerns of being overwhelming for the child with ASD as well as the family unit. This was exemplified in case 1 where they discussed the relationship between their son and the first companion canine they acquired prior to deciding upon a smaller breed. “We had a really big big canine...he was great with kids but so big and ChildOne did not interact with him, really at all. He was just too big. He (the canine) now lives with my parents (Case 1).” Small-medium sized breeds were the preferred size chosen by the families with reported fears that a larger breed might be overpowering (e.g., pulling the child while walking or knocking the child over).

Behavioural/temperamental traits of the companion canine as described by the participating families and observed by the researcher, also appeared to impact the strength of the child-canine bond. Throughout the researcher’s semi-structured interviews with the parents and collection of observational data, two subthemes related to canine characteristics were identified: 1) desirable; and 2) undesirable. Desirable characteristics are operationalized as qualities of the canine that contributed to a strong child-canine bond. Whereas undesirable characteristics are operationalized as qualities of the canine that detracted from a strong child-canine bond.

4.3.3.1 Desired

Behavioural/temperamental variations existed between the companion canines participating in this study. Despite these variations, the most frequently discussed behavioural/temperamental characteristic of the companion canines was tolerance (i.e., a canine's willingness to endure specified conditions or treatments).

The bullcanine, no matter what you do, doesn't get angry or aggressive. You can do anything to them...ChildOne will grab their wrinkles and squeeze them...he will squeeze when he's excited and sometimes he needs that input and he will grab underneath their jowls...His behaviour interventionists are amazed by what these canines will let him do. He will lay right on top of them. He sits on them and lays on them and they will not run away, they will just lay there and take it (1).

You can do anything to him. He is very tolerant and the kids have always played with him like this. They can do anything...He puts up with a lot (6).

Submissive canine behaviours were also described as being desirable for a child with ASD. A canine that readily surrenders authority, seeks human leadership, is highly trainable and reliable and has no desire to dominate is often characterized as being submissive.

He is happy to go along with things but generally not the leader. Not the one to charge out there. Always has an eye out to check what is going on and what he should be doing. He is very gentle. He is more submissive and is looking for what the right moves are and wants to follow along and stay close...he was really really good with them as little babies crawling on the floor. There were never any feelings of there being some sort of issue. He is a fantastic family canine (3)!

A common canine behaviour that was both sought after and described as being desirable was a canines' ability to tolerate multiple and unpredictable behaviours characteristic of a child with ASD (e.g, stemming behaviours, pinching, squeezing, jumping and shouting). This behaviour can also be referred to as being "bombproof" meaning nothing within the bounds of reason, will startle the canine.

We decided on the Golden Doodle...we were looking for a breed that was known for unconditional attachment and ease of attachment and NO aggressions, very tolerant of multiple behaviours (2).

Children on the spectrum can be, like ChildOne jumps, and canines can be scared because they are unpredictable and ChildOne can be unpredictable and these canines are so patient. Their calm demeanor, their size and structure, their personality, I truly don't believe there is a better canine for an autistic child (1).

4.3.3.2 Undesired

Several participating families reported characteristics exhibited by their companion canine that were undesirable and potentially detract from a strong child-canine bond. The most salient undesired behavioural/temperamental characteristics were dominance possessiveness and/or aggression.

He can be so sweet and cuddly but then he wants to dominate, definitely...at first he was so quiet and then all of a sudden, yeah like if you wake him up from his nap or something he might growl and if he goes out with other puppies he really wants to be the dominant one...It does worry me a bit, but he is still a puppy...but yeah that worries me a little bit because with our friends canine, the kids would lie all over her and they would just dress her up and she was so easy going...he

definitely has aggressive tendencies (5).

Insecurity (e.g., shy, untrusting/fearful), disengagement (e.g., aloof), and attachment issues (e.g., attachment geared towards adults versus children) were also reported as undesirable canine characteristics.

He is very insecure because he is a rescue, so you can see signs of that insecurity in him...He is not overly playful...He is more geared towards adults, he is not as kid oriented. If he was more playful and would run the ball to them I think they would be all over that. It is limited to a certain degree just because of his nature. He likes adults more than children... He has a very dysfunctional attachment to my husband. I think that has affected his bond with the kids, in a negative way. He has an insecurity without that approval from a male adult, you can never fill that need in him. He wasn't socialized properly with other canines or people so we can't take him to canine parks because he will just start barking at the other canines (4).

4.3.4 Canine as Family Member

One of the most remarkable findings that appeared to have a strong influence on the child-canine bonding process was the placement of the canine within the family system. For example, consideration and treatment of the companion canine as part of the family unit evidently had a significant impact on the child-canine bond. Treatment of the companion canine as a family member was most evident in cases 1, 2, 5, and 6.

4.3.4.1 Evidence from Parents

In case 1, the parents reported that the development of an attachment relationship between their son with ASD and the companion canines occurred suddenly and described it as a

“light-switch moment.” The family reported that by treating the canines as members of the family may have contributed to the change in their son’s behaviour toward the companion canines.

After six weeks it was all of a sudden, like a light switch turned on with ChildOne and all of a sudden he follows them around he pinches them and he wants to be with them all of the time. One day he wanted nothing to do with them and the next day he won’t stop following them around... We would always encourage him to spend time with the canines and they were always up on the couch, they were the first canines we had that we allowed to come up on the couch and cuddle and maybe he saw that (1).

Case 6 explained how important it is that their companion canine be included in all family activities: “he comes everywhere with us, he will come in the car. If we go travelling he will come with us. He will go with us everywhere.” Other participating families also indicated that their companion canine(s) would be included in day-to-day activities.

The canines are always with us, there is no time the canines are not with us and ChildOne, unless he is at school. If we go on vacation they always come with us and we haven’t had a situation where they are not with us yet (1).

They are not really away from him aside from school. And I take him in the car...yeah, it is a little tough to answer because we haven’t really been away from him. If anything were to ever happen to him though it would be devastating (5)!

To illustrate a comparison for the reader, case 4 reported that at one point they considered giving their companion canine away. “There was a time we were thinking of re-homing Caninefive just because we thought it was too much to look after.” The concept that the canine

was replaceable became evident and perhaps contributed to the lack of bond observed between the children with ASD and their companion canine. These cross case comparisons highlight the notion that how the canine is situated within the family system can impact the child-canine bonding process.

4.3.4.2 Evidence from Observations

These findings were also corroborated by the researcher's observations. The researcher identified that families who treated and described their companion canine(s) as an equal member of the family also reported a strong child-canine bond. Treatment of the companion canine as part of the family unit was characterized by families who allow their companion canine(s) on the furniture, travel with their companion canine(s), and permit the companion canine(s) to sleep in their child's bed.

4.3.5 Family Profile

Family profile was the fifth prevalent theme to emerge during the cross-case analysis and is described by the researcher as characteristics of the family and characteristics of the child with ASD that contribute to child-canine bonding. Throughout the researcher's semi-structured interviews with the parents and observations, three subthemes related to family profile were identified and included: 1) child's previous experience; 2) parental knowledge and experience; and 3) motivation.

4.3.5.1 Child Previous Experience

A prominent subtheme noted by the researcher is whether or not the child with ASD had previous experience with animals prior to integrating companion canine into the family home. Previous experience with animals was not limited to canines and did not require extensive involvement with animals however it was identified that the participating children with ASD

who were accustomed to having other family pets (i.e., the normalization of family pets) and/or being around other pets (e.g., neighbors and/or friends pets) formed a strong bond with their companion canine(s).

4.3.5.2 Parental Knowledge and Experience

Parental prior knowledge and experience with canines is the second subtheme falling under family profile. Parental knowledge included knowledge regarding breed specific behaviours and breed characteristics, research on the therapeutic benefits canines can have on children with ASD, and previous experience with canines (e.g., growing up with canines).

Four of the participating families (i.e., 1, 2, 5, 6) reported having specific knowledge regarding various canine breeds and were selective about choosing a canine that matched their family's lifestyle and child's needs.

With two young boys, we needed a canine that was great with kids. Bull canines are in the top ten canines that are best with kids. The last canine was too big, so the kids could not play with the canine. So that was the drive with this breed, something small, stinky, and solid... I love big canines, so the drive for me to get these canines was for ChildOne (1).

So he is an Australian Labradoodle, and the reason we chose him was because our friends had a Golden Doodle and the kids were just so attached to her...we always knew if we got a canine that is the type of breed we wanted because it is a known breed to be good with kids and it is a family canine and with our kids we weren't going to do SPCA because you just didn't know what you were going to get and so far us we just wanted a little bit more of a sure thing and was more known to have a good reputation for being good with families so we didn't want to take any

chances (5).

To illustrate a comparison for the reader, cases 3 and 4 appeared to have little knowledge regarding breed specific behaviours and breed specific characteristics. This lack of knowledge appeared to contribute their decisions concerning canine selection which may have detracted from the child-canine bond. For example, in case 4, although size was an important determinant when the family was selecting a companion canine, they reported being very opportunistic and open-minded regarding breed, temperament, and history (e.g., the background of a rescue canine).

We wanted something in between a small and medium size...When we went to the SPCA we were having trouble finding one that was out in display so the SPCA worker went to the back and brought Caninefive in his arms. We were then like "oh he is so cute!" It was not the breed in particular he just looked like this ball of snow (4)

Knowledge of the therapeutic benefits canines can have on children with ASD and previous experience with canines (e.g., growing up with canines) also appeared to contribute to the formation of a strong child-canine bond.

There was definitely research...I think it started with just the therapeutic benefits of owning a canine in general and then kind of went into the ASD connection and AAT as an avenue (2).

Positive previous experience with canines was a common subtheme among the participating families. Families with positive previous experiences expressed a consistent understanding that a companion canine could provide therapeutic benefits for children with ASD.

We owned all kinds of canines and I owned 20 canines over my life and all kinds of breed... We have always had canines around here. Both of us growing up... we really wanted our children to have the same experience that we did when we were kids (1).

4.3.5.3 Motivation

Motivation was the third subtheme to emerge under family profile. It became apparent that participating families identified motivational factors as influential in their decision to integrate a companion canine into the family home. Motivational factors included whether or not the desire to integrate a canine into the family home was equally shared by all members of the family, whether or not the canine was intentionally acquired for the child with ASD, and whether or not the child with ASD was motivated to get a canine (e.g., persistently asking for a canine, demonstrating responsibility for canine ownership such as saving up money for a canine bed, writing out a list of things he/she will do to take care of the canine).

The cross-case analysis revealed that there was a stronger child-canine bond in the participating families who collectively agreed upon integrating a companion canine into the family home and shared mutual excitement regarding this decision. In five out of the six participating families, parental and familial desire to integrate a companion canine into the family was shared. Comparatively, in case 3, motivation to integrate a companion canine into the family home was not shared by all family members which may have detracted from the child-canine bonding process:

It was more my husband who wanted a canine than I did... My husband's sense of enjoying the companionship is more than mine, not that I don't like having a canine, but I don't necessarily feel like I need to fill up the house with another

thing to take care of and I am sure that comes with having the kids. I think the bonding thing is what drew him to having a canine, I am more of a cat person.

The canine was more his idea than mine, but I certainly like canines (3).

The data also revealed that a strong child-canine bond was evident in families who intentionally acquired a companion canine for their child with ASD. A majority of the participating families indicated that their child's(ren's) keen interest and motivation to integrate a companion canine into the family home was an influential deciding factor.

We knew that eventually we would want a canine in our family and that a canine would be a positive addition to our family and so I think that it was mostly the kids but mostly something that we wanted as a family anyways. But the key motivation would definitely be the kids. Mostly our daughter but our son has actually been so helpful and involved... I think that just the unconditional love.

We watched something on it about kids with more severe ASD and canines and how they would do really well with canines (5).

Through the analysis of the semi-structured interviews with the participating families it became evident that a strong child-canine bond occurred when the child with ASD was motivated to get a companion canine. For example, one participating family (2) reported that their son with ASD was highly motivated to integrate a companion canine into the family home which helped facilitate a strong bond.

He was just so interested in having the canine so that facilitated his interest in bonding...He was persistent and my wife channeled that and made him take some ownership, he had to save up some money to help pay for a canine bed and he had to promise and he wrote out some things he would do with the canine and he's

lived up to it. He did lobby for the canine and some responsibility attached to it (2).

Case 5 also contested that their children's keen interest facilitated a strong bond. They bonded right away. They both wanted to be around him all of the time! It was not necessary to try to facilitate a bond. If anything it was the opposite, they need to let him be sometimes and I tell them he needs to sleep, let him sleep!

4.3.6 Benefits

The sixth theme to emerge from the cross-case analysis was benefits. Familial benefits elicited by companion canines for families impacted by ASD was not initially intended to be a focal point in this study. However, throughout interviews with the participants the positive effects that the companion canine(s) have had on the families often became a focus of discussion throughout the interview process and therefore must be acknowledged. Two overarching benefits of companion canine acquisition for families impacted by autism were identified. These included: 1) benefits for the children with ASD (e.g., increased maturity, responsibility, and capability, increased social interactions communication skills development, emotional regulation); and 2) familial benefits (e.g., reduction in parental stress, increased togetherness or cohesion of the family unit, increased social outing).

4.3.6.1 Benefits to Child

Parents reported that their children with ASD were benefiting through companionship, unconditional love and stress relief.

I think just that unconditional love... it would be good for the kids' self-esteem and what not, they have trouble at school, they don't have a lot of friends and we thought with canines, no matter what happens they will love them. He will want

to kiss them when they get home from school and even if we are mad at them or the school is mad at them. That was something we thought it would be good for them. That consistency (5).

In case 6, ChildEight's mother explained how their companion canine provided an opportunity for her daughter to develop an attachment relationship.

Canines will always come back for you. That unconditional love, kids need to feel that...to have an animal you know, kids just need to feel that...I remember our behaviour interventionist came over and they told me I had to teach her attachment and I was just blown away! Having an animal can facilitate that learning. CanineSeven has taught ChildEight about attachment...(6)"

Other prominent benefits included developmental changes (e.g., increase in maturity, responsibility, and capability), emotional regulation, other regarding (e.g., demonstration of empathy and care towards animals as well as peers) increased social interactions and communication and increased patience and tolerance (e.g. sitting quietly for long periods).

Participating parents reported that their children with ASD were fascinated with their companion canines and showed them more affection and positive social behaviour than they showed people. The quality of the relationship with the companion canine was, according to a majority of the participating parents' descriptions, often strong, unique, and deep. One mother said:

The way he looks at these canines, he studies them and he actually puts their ears on his lips and looks at them. I truly believe that he studies them. It is a connection that I can't explain. He wouldn't give a person that much attention. He has a connection with these canines that he has with nobody outside of his

immediate family. Since you've been here, he's probably looked at you twice...but with these canines, he will stare at them for longer than he will actually stare at us.

A majority of the parents reported that interactions with the companion canines facilitated considerable growth in the areas of emotion recognition, perspective taking, and empathy. One mother said:

It brought ChildEight out and her ability to think of others is the biggest thing we have noticed. She will think to care for CanineSeven and that transfers to others. She will think to feed CanineSeven and that is something we have never seen before. She has much more empathy and showing care because she is feeling that love with CanineSeven you know, I love something and it loves me back (6).

ChildEight's mother further stated that the relationship between her daughter and the companion canine has increased her ability to think of others (other regarding) which has transferred to her relationships with other peers.

It is growing that empathy part. Instead of you know laughing at someone who gets hurt she has much more empathy. For example, her friend cut her finger at school the other week and she took her to the teacher and stood by her side the entire time to make sure she is okay, and that would not typically happen. It was not there two years ago, before CanineSeven (6).

Participating parents additionally reported that the interactions with the companion canines facilitated more responsibility-based relationships, such as grooming and caring for the animals' needs, and encouraged the children to engage in activities such as walking the canine and taking the canine to obedience classes. Responsibility-based relationships were evident

across each case. In case 6, ChildEight's mother offered, "she is more active now that we have CanineSeven, just having that responsibility...She will think to feed CanineSeven and that is something we have never seen before." ChildSix and ChildSeven's parents (case 5) pointed out that they are both very involved in the care of CanineSix, "...they will take him out to go to the bathroom, they will take him for short walks, and they will feed him...they have demonstrated more responsibility." ChildTwo's father pointed out that since getting CanineThree, they have seen tremendous developmental changes.

It has been very good for ChildTwo's development...over the last six months we have seen a huge change in maturity and capability and responsibility...There has been some really good quality changes in relation to, I think part of it is looking after a canine... Yes, definitely so many increases in responsibility (2).

Responsibility-based relationships also require the ability of the individual to take perspective and recognize the needs of others based on contextual information as well as their expressions, words and/or actions (cognitive empathy) (Smith, 2008; 2006). ChildTwo's father narrated that his son demonstrates a level of care for his companion canine that has never been seen before they integrated their canine into their home. The following quotation is from a story that ChildTwo's father shared to illustrate how a responsibility-based relationship is evident between his son with ASD and the companion canine. At this time in the interview ChildTwo's father was telling the researcher a story of when they took their canine on a hiking trip up in the mountains following a snowstorm.

After our hike, I left to take our other son to school and when I got home ChildTwo took CanineThree and put him in the bath to take the snow off of CanineThree and it was just such a fantastic demonstration of care...That was a

level of care for CanineThree that ChildTwo would not demonstrate for himself or other humans.

Parents have also reported increased social skills development in their child(ren) with ASD due to the presence of the companion canine(s). In case 3 the mother stated:

...one of the first things he says when he meets people is “Hi, I am ChildThree, and we have a canine named CanineFour!” Even if CanineFour is not with us, it is front and centre in terms of how he defines himself and his family and what is most real to him...Having CanineFour around to interact with has opened up ChildThree’s interactions with other canines and being more comfortable in social settings (3).

ChildFour and ChildFive’s mother stated that their canine has increased her children’s willingness to engage with people outside of their immediate family.

When people come to the house, it is that topic starter and something that everyone has that common ground to interact because people will ask questions about the canine so if we are meeting someone new or whatever, CanineFive can do that (4).

In case 1, ChildOne’s mother described how her son is proud of the canines which puts him at ease during social interactions.

He is very proud of the canines, if we are with the canines and they draw some attention he is very proud of the canines. I think with ChildOne, just the sense of familiarity it makes him feel at ease in social situations. He will be calmer for longer if the canines are around (1).

4.3.6.2 Benefits to the Family Unit

A child with ASD presents pervasive and bidirectional influences on the entire family system. That is, not only do behaviours persist overtime but these behaviour's impact both the child and the family's functioning. Living with a child with ASD presents different challenges for everyone, however there were commonalities that most participating families expressed. Throughout the conversations, parents reported challenges and stresses associated with having a child with ASD. Parents described household chaos, family dysfunction, and feelings of unease because they never knew when an emotional breakdown was going to happen.

The present study presents emerging evidence that companion canines can positively impact families affected by autism. Benefits included increased togetherness or cohesion of the family unit, increased social outings and activities, and decreased levels of stress experienced by the family unit due to a reduction in emotional outbursts which are characteristic of children with ASD.

In case 1, the mother described how their companion canines have inadvertently increased togetherness and cohesion of the family unit by increasing their child's tolerance for typical family experiences (e.g., sitting on the couch watching a movie, going on family vacations).

If we are all cuddling on the couch watching a movie it would be unusual if they were not there. Because he will sit there for hours with us if they are there...this is a perfect example, instead of ChildOne sitting with us for ten minutes, he will sit with us for two hours if the canines are there (1).

We went to Tofino last year and ChildOne would normally be very upset going long distances but with the canines next to him that seemed to calm him...he

would not normally last as long in a travel situation if the canines were not there (1).

In case 2, the mother commented on how their companion canine has provided an opportunity to engage in family outdoor activities.

90% of the exercise CanineThree gets is me taking him out with the boys. When they were little I would push them in the stroller and we would take him to the canine park. Now that they are getting older we will take them up to the hills and go around the hiking trails and stuff (3).

Several parents reported a reduction in stress due to a decrease in their child's emotional outbursts. One family in particular described how the companion canine has increased their son's ability to recognize emotions and discern how the canine is feeling based on nonverbal information, such as gestures, body position, and expressions (e.g., tail in between the leg, ears pinned back, cowering under the table). This in turn, has increased their son's ability to regulate his emotions.

ChildTwo used to get very angry and that would scare the HELL out of CanineThree. So, he actually works to keep himself calm by reading CanineThree's response. It hasn't happened in so long I have forgotten but yeah there used to be a lot of yelling before CanineThree. When there was anger CanineThree would withdraw away from that (2).

For families impacted by autism, emotional outbursts in children with ASD may occur frequently. For this family in particular, they felt relief and were able to relax again as the fears about their child having a "melt-down" were eased.

4.3.7 Other

Also noteworthy was the identification of miscellaneous themes not fitting in categories above. Although they were not prevalent across all cases, they were stressed within individual cases and merit recognition. Miscellaneous themes included incubation period, bi-directional effects, and no competing interests.

Incubation period refers to a period of time during which attachment is not immediately evident but is in development. This was demonstrated in case 1 where the parents pointed out that their son's attachment to the companion canines did not occur immediately after integrating the canines into the family home. The parents referred to the sudden occurrence of an attachment bond as though a "light-switch turned on" after six weeks.

ChildOne did not interact with them for the first six weeks, he would recoil and pull his hands away and he wanted nothing to do with the canines. I still remember the day, my husband pointed out, he was in the bed and CanineTwo was in the bed with him lying. It went from wanting nothing to with the canines to inseparable. After six weeks it was all of a sudden, like a light switch turned on with ChildOne and all of a sudden he follows them around he pinched them and he wants to be with them all of the time. One day he wanted nothing to do with them and the next day he won't stop following them around.

Other families reported that a bond formed immediately without the need to implement any bonding strategies. One mother said, "They bonded right away! They both wanted to be around him all of the time! It was not necessary to try to facilitate a bond (5)." It is evident that the formation of an attachment relationship between a child with ASD and their companion

canine does exist however, can vary. Autism is a complex neurobehavioural disorder and therefore might affect the child's ability to immediately form an attachment bond.

Children with ASD may exhibit multiple and unpredictable behaviours (e.g., stemming, squeezing, pinching, yelling). These behaviours were tolerated by the companion canines which evidently had a bi-directional effect. For example, the children appeared to be more tolerant of behaviours exhibited by their companion canine(s) (e.g., licking, jumping, barking) which normally would not be accepted from another human being (e.g., kissing, physical contact, making loud noises). This was illustrated in case 1 where the son would wipe his face after his mother kissed him but would happily accept kisses from the canines. "For him, he has a lot of sensory issues so for him to kiss the canines is huge. When I give him a kiss he wipes my kissed off but with the canines he never wipes the kiss off."

Lastly, the cross-case analysis revealed that competing interests could potentially hinder the formation of a strong child-canine bond. Children with ASD often exhibit highly restricted, fixated interests that are heightened in intensity or focus; such as a strong attachment to or preoccupation with unusual objects, or excessively circumscribed or perseverative interests. Though interest was evident in interacting with companion canines, other more attractive activities could usurp this (e.g., tech-driven games). For example, in case 1 the mother mentioned that her son with ASD has a fixated interest with electronics and said: "if he walks past them and sees them and he's got no electronics in his life, he will get up and go squeeze them and pinch them...(1)." ChildThree's mother also indicated her son's fixation for inanimate objects and mentioned that if they are available, her son prefers to play with flashlights and tech gadgets over interacting with the companion canine. In reference to her son's interactions with

the companion canine she said, “I would say it’s sporadic, he is much more pre-occupied in his own things than engaging CanineFour (3).”

4.4 Summary

In this chapter, the findings of this qualitative case study were presented. Using Bowlby’s Attachment Theory as a theoretical framework, it became evident that the child-canine bond in children with ASD can be conceptualized as an attachment relationship. Proximity maintenance and safe haven were identified as being the most prevalent features of attachment while secure base and separation anxiety were identified as being the least prevalent features of attachment.

Additionally, the seven major themes characterizing child-canine bonding were presented and included: 1) *canine acquisition*; 2) *bonding strategies*; 3) *canine characteristics*; 4) *canine as family member*; 5) *family profile*; 6) *benefits*; and 7) *other*. Each of the major themes and subsequent subthemes were described and discussed as factors that either contribute to or detract from the child-canine bonding process.

CHAPTER 5 – DISCUSSION OF FINDINGS, IMPLICATIONS AND CONCLUSION

5.1 Overview

This is one of the first studies to examine child-canine bonding in children with ASD. The findings highlight useful information regarding features of attachment characterizing the child-canine bond, factors influencing this bonding process, and the positive impact of the child-canine bond for children with ASD as well as the family unit.

In this chapter, the most salient aspects of the findings will be discussed. This discussion will focus on the nature of the child-canine relationship and the factors influencing the bonding process and how families impacted by autism can help ensure a strong child-canine bond. As well, the perceived benefits of a companion canine for families impacted by autism will be discussed. Next, the theoretical and applied significance of this research will be presented and the limitations of the study will be addressed. Finally, this chapter will close with a conclusion.

5.2 Summary of findings

Recall that the aim of this case study was to examine the dynamic, triad relationship between the child, the family companion canine, and the family unit. The objectives of this research were to observe child-canine interactions, identify strategies used to facilitate child-canine bonding and identify characteristics of children with ASD, family companion canines, and families themselves that contributed to child-canine bonding. The two overarching research questions that guided this study were as follows:

1. Is there evidence that the attachment components of safe haven, secure base, proximity seeking, and separation anxiety are evident features of the child-canine relationship? If so, to what extent are these four features of attachment evident?

2. What personal and external factors influence the child-canine bonding process and what are the prevalent themes characterizing child-canine bonding?

Three main data sources were used to gather information related to the research questions: 1) semi-structured interviews with the parent(s); 2) field notes; and 3) observations of child-canine interactions. First, the analyses revealed that the child-canine bond in children with ASD exhibits the dynamics of an attachment relationship and secondly, seven emerging themes characterizing child-canine bonding emerged. Important factors influencing the formation of a strong child-canine bond were identified and included characteristics of the child with ASD, characteristics of the companion canine, and characteristics of the family unit. The key findings of this study will be discussed in this chapter.

5.2.1 The Nature of the Child-Canine Relationship

One of the primary questions guiding this study was whether the child-canine relationship could be conceptualized as an attachment relationship. Julius (2013) postulates that if attachment theory is representative of the relationship between humans and their companion animals, then the companion animal has to meet the criteria of an attachment figure as defined by Ainsworth (1991). Recall that an attachment relationship is defined as having the following characteristics: 1) The physical proximity of an attachment figure is associated with positive emotions; 2) The attachment figure is approached in the case of emotional stress in order to achieve proximity and a feeling of security; 3) The attachment figure is a reliable source of comfort and reassurance that allows for exploration; 3) and 4) Separations from the attachment figure are associated with negative emotions (Ainsworth, 1991). The present study suggests that children with ASD can develop attachment-like relationships to their companion canines.

Proximity maintenance was identified as the most prevalent feature of attachment exhibited in the child-canine relationship. The children with ASD often maintained close physical nearness to their companion canine(s) and would seek out their companion canine(s) immediately following a separation (e.g. returning home from school and/or extra-curricular activities). Interestingly, several families reported that the need for their child(ren) with ASD to maintain proximity to the companion canine(s) was often greater than the need to maintain proximity to fellow peers and even members of the immediate family. This was perhaps one of the most important findings as it signifies how meaningful the child-canine relationship can be for a child with ASD.

Following proximity maintenance, safe haven was the second most prevalent feature of attachment in the child-canine relationship. Parents reported that the companion canine(s) provided comfort for their child(ren) with ASD during times of emotional upset. As a result, the children with ASD were better able to regulate their emotions during distressing situations. The companion canine appeared to provide an emotional outlet for the children with ASD, which, in turn, relieved pressure felt by the family by reducing the intensity and occurrence of emotional breakdowns. Many children with ASD have a strong need for a structured, routine environment, as change can create feelings of fear and/or anxiety which may lead to emotional outbursts (Burrows, Adams & Spiers, 2008). This study revealed that the companion canine may provide a source of consistency in an ever changing environment for a child with ASD.

Interestingly, parents reported that the companion canine(s) also provided comfort in the form of physical contact and social support for their child(ren) with ASD.

I think just that unconditional love... it would be good for the kids' self-esteem and what not, they have trouble at school, they don't have a lot of friends and we

thought with canines, no matter what happens they will love them. He will want to kiss them when they get home from school and even if we are mad at them or the school is mad at them. That was something we thought it would be good for them. That consistency (5).

Outside of school, the children with ASD would spend a majority of their time with their immediate family (e.g. parents, siblings, and grandparents). As a result, they were consistently in proximity to a number of family members. Not surprisingly, parents reported that their child(ren) with ASD would most often seek comfort from their mother during times of distress. Remarkably however, if the mother was not present during a time of emotional upset, several of the children with ASD reportedly turned to their companion canine for comfort despite the availability of alternative sources of comfort (e.g. their father, siblings and/or grandparents). This is indicative that the companion canine is a selective preference as an attachment figure and not merely influenced by physical proximity. Furthermore, when parents were asked who their child with ASD turns to during times of distress, two fathers surprisingly reported similar statements explaining that there was a “pecking order” of who their child with ASD turns to when upset. Both fathers stated that their child with ASD will seek their mother first, then their companion canine(s), and lastly, themselves.

Proximity maintenance and safe haven were identified as the two most prevalent features of attachment in the child-canine bond. This now guides us to our third most prevalent feature of attachment; secure base. Throughout some of the discussions with the participating families, it was noted that safe haven and secure base would often coincide. For example, the companion canine would act as a reliable and consistent source of comfort (safe haven) for the child with ASD, which, in turn, would nurture a sense of felt security (secure base). Parents frequently

reported that the companion canine provided a sense of comfort to their child(ren) with ASD, which, as a result, would increase their child's(ren's) willingness to engage situations that might otherwise be stressful.

ChildOne would normally be very upset (travelling) long distance but with the canines next to him that seems to comfort him. Whenever we travel, one of the canines will be sitting beside ChildOne and when we are driving he will be pinching the ears, stroking the head, just pinching the canine. One of the sweetest things, he will grab the folds of their ears and rub them against his lips just because they're soft, or he will rub them on his cheek...he also likes to put his face in CanineThree's belly (1).

Separation anxiety was the least prevalent feature of attachment evident in the child-canine relationship. Similar to Kwong's (2011) challenges examining the human-assistance canine relationship, the assessment of separation anxiety in the current study was complicated. In Kwong's study, separation anxiety was difficult to assess due to the participants' functional dependence on their canine. In the current study, most of the children with ASD were never apart from their companion canine and expressed no interest in being separated. Parents did indicate however, that the possibility of their child(ren) with ASD being separated from his/her companion canine(s) would likely cause significant upset for them.

5.2.2 Factors Influencing and Benefits from the Child-Canine Bond

Seven major themes characterizing child-canine bonding emerged during the cross-case analysis. Emerging themes included external and personal factors that contributed to or detracted from the child-canine bond (i.e., canine acquisition, bonding strategies, canine

characteristics, canine as family member, and family profile), benefits of owning a companion canine for families impacted by ASD, and miscellaneous themes not fitting in categories above (i.e., incubation period, bi-directional effects, and no competing interests). These findings are discussed in more detail below.

5.2.2.1 Canine Acquisition

When and how the canine was acquired emerged as a prevalent theme that appeared to effect the strength of the child-canine bond. It became evident that a stronger child-canine bond occurred between the children with ASD and their companion canine when the family acquired the canine as a puppy. Previous research has postulated that children are more likely to establish a strong bond with an animal when they understand the animal's specific needs and participate in caring for it (Melson, 2001). A puppy requires constant care and regular obedience training which may have provided an opportunity for the children with ASD to establish a stronger bond. It has also been established that activities shared together between a child and their canine develop a stronger bond (Jalongo, 2015). Therefore, children who participate in attending to a puppy's needs are investing more to establish an attachment relationship (Jalongo, 2015).

In addition to the age of the canine at the time of acquisition, the timing when the canine was acquired also appeared to impact the strength of the child-canine bond. For example, children whose families integrated a companion canine into their home following their ASD diagnosis exhibited a stronger bond compared to those who integrated a canine into their home prior to their ASD diagnosis. This subtheme was apparent even if the family already had a companion canine living in the family home who was acquired prior to their child's ASD diagnosis (with which their child appeared to have no particular attachment to the canine) and later, following their child's ASD diagnosis, integrated another companion canine into the home

(with which their child demonstrated a strong bond to). This was illustrated in case 1 where the family already had companion canines in the house prior to their son's ASD diagnosis with which he demonstrated no particular interest towards.

I didn't think ChildOne would ever connect with a canine because we already have Bouone then we bought Boutwo, he was our Leonberger, and he never paid any attention to them at all. So we bought them (the bullcanines) never knowing there would be a bond between them (1).

Perhaps the intentionality of acquiring a companion canine specifically for the child(ren) with ASD positively influenced the development of a strong child-canine bond. For example, the families who acquired a canine following their child's ASD diagnosis reported specifically selecting a canine to match their child's needs (e.g., a smaller sized breed that is playful and tolerant of multiple behaviours). Furthermore, establishing a bond immediately following canine acquisition provides an opportunity for a stronger child-canine bond to occur (Jalongo, 2015) and in the current study, appeared to contribute to the development of an attachment relationship.

The timing when the companion canine was acquired (e.g., pre or post-ASD diagnosis) as well as decisions and considerations regarding canine selection evidently affected the strength of the child-canine bond. A pattern emerged between the acquisition of companion canines and the strength of the child-canine bond. For instance, families who made intentional decisions regarding canine selection reported a stronger child-canine bond between their child(ren) with ASD and their companion canine(s) compared to the families who reported being opportunistic regarding canine selection (e.g., flexible, open and not driven by specific canine selection criteria). These findings were also corroborated by the researcher's observations who noted each child's proximity to the companion canine, initiation of contact, and each child's attitude towards

the canine (e.g., displays of affection, demonstration of pride toward the canine, and initiation of social communication with the researcher when discussing the canine).

Intentionality was defined as careful and purposeful decisions regarding canine selection. The most widely reported decisions regarding canine selection between the families who intentionally acquired a canine included selecting a breed that suited the families' needs and lifestyle and the size of the canine. Across cases, breed considerations predominantly revolved around temperament and canine size. Families who made intentional decisions regarding canine selection reported a stronger child-canine bond compared to the families who were opportunistic and not guided by specific canine selection criteria. For families impacted by autism who are considering integrating a companion canine into the care plan, this finding signifies the importance of carefully selecting a companion canine that meets the child's, as well as the family unit's needs.

5.2.2.2 Bonding Strategies

Strategies that appeared to influence the bonding process between the child(ren) with ASD and the companion canine(s) also emerged as a prevalent theme. Strategies included those that were intentionally implemented by the parents (e.g., training the canine to sleep in the child's bed, involving the child in the care of the canine, having the child enroll and take the canine to obedience classes) as well as unintentional strategies (e.g., involving in the child in the canine-acquisition process, continued obedience training well after a bond has been established) that appeared to contribute to the child-canine bonding process. Strategies included those that occurred: 1) prior to integrating the companion canine(s) into the family home (pre-canine acquisition); 2) immediately following acquisition of the companion canine(s) (post canine

acquisition); and 3) continuing after a bond between the child with ASD and the companion canine had been established (ongoing).

Involving the child(ren) with ASD in the canine-acquisition process appeared to foster positive attitudes and excitement about integrating the companion canine(s) into the family home as well as helped prepare the child(ren) with ASD for changes. Additionally, encouraging positive interactions such as play activities, obedience training, and caring for the canine corresponded to a stronger child-canine bond. These activities also provided an opportunity for the child to learn how to care and love another sentient being, which for a child with ASD, is important given their challenges developing cognitive empathy (Smith, 2006; 2008). Having the children with ASD spend time with the companion canine helped develop trust, confidence, and love and created a feeling of familial belonging. Activities such as playing, walking, hiking and training appeared to nurture intimacy therefore positively contributing to an attachment relationship. In addition, obedience training taught the child about cause and effect and provided the child a way to communicate with the canine. Interestingly, for children with ASD who have social deficits and may not have the ability to use voice commands as in case 1, signs can be used to teach commands (e.g., holding your hand out with your palm facing up means “sit”).

Ongoing strategies such as continued obedience training (e.g., ten minutes of obedience training per day), physical contact (e.g., petting, cuddling, hugging) playing with the canine, and continued care of the canine (feeding, walking, grooming, and picking up after the canine) encouraged the maintenance of a strong child-canine bond.

5.2.2.3 Canine Characteristics

The characteristics of the canines had a salient influence on the child with ASD as well as the family unit. Filiatre, Millot, and Montagner (1986) claimed that a canine’s characteristics

influences children's interaction with them. Canine characteristics include age, size, and behavioural traits. Filiatre and colleagues postulated that older canines were less likely to interact with children due to a lack of energy and tolerance. It was observed in this study that the children with ASD would often seek out the companion canines during times of distress or anxiety and would engage in physical contact (e.g., pinching, grabbing, touching) with the canines to alleviate stress. According to Filiatre and colleagues (1986) older canines might be less tolerant of physical touch from children and therefore less inclined to interact with them.

Comparatively, the families with younger canines who were integrated into the home as a puppy would happily engage with the child(ren), were more energetic and playful, and more tolerant of multiple and unpredictable behaviours often exhibited by children with ASD. Children with ASD can be very tactile and may seek sensory stimulation when feeling anxious, stressed or excited (e.g., pinching, grabbing, touching). Canines who are not accustomed to these behaviours may become fearful or avoidant of that stimuli (Burch, 2012). This avoidant behaviour was both reported and observed in the families who had older canines in their home (i.e., cases 1, 3, & 4).

The age of the canine, as well as the time of acquisition, may explain this trend. During a puppy's developmental stages, socialization and habituation is established (Burch, 2012). According to Burch (2012), socialization can be described as the process whereby the canine learns how to recognize and interact with the species it cohabits with. For the domestic canine, this would include the family unit and other family pets (e.g., cats, birds, guinea pigs). By learning how to interact with the family and other species, the canine develops the ability to recognize whether or not it is being threatened and how to recognize and respond to the intentions of others. Burch (2012) described habituation as repeated exposure to a particular

stimuli. When a puppy is exposed to a specific stimuli several times it will become accustomed to that stimuli and learn to ignore it. This might explain why a stronger child-canine bond was reported and observed in the families who acquired the companion canine as a puppy. Perhaps because the puppies were exposed to these behaviours characterized by children with ASD during the developmental stages, it provided the puppies with the opportunity to become accustomed to these behaviours therefore influencing their willingness to engage with the child(ren) with ASD. Moreover, younger canines might be more likely to engage with the child(ren) and exhibit more playful behaviours. When the canines elicited engagement from the children with ASD by reciprocating interest through play and responding to instructions, a stronger child-canine bond was evident.

In addition to age, size of the canine arose as an important characteristic impacting the child-canine bond. Large breeds appeared to present an obstacle from the bonding process with concerns of being overwhelming for the child with ASD as well as the family unit. Small-medium sized breeds were the preferred size chosen by the families with reported fears that a larger breed might be overpowering (e.g., pulling the child while walking or knocking the child over).

Portability of the canine, which corresponds to size of the canine, also affected the child-canine bond. Having a small-medium sized breed of canine allowed the families to easily include the canine in family travel as well as incorporate them into their daily routines (e.g., driving in the car, laying on the couch, sleeping in the child's bed). Perhaps as expected, by consistently including the canine in the child's day-to-day life, the child-canine bond strengthened.

When the families were asked what drew them to acquiring their particular canine(s) versus

other canines they may have considered, temperament emerged as the primary reason across cases. A stronger child-canine bond was evident in the families who described their canine as being submissive (e.g., readily surrenders authority, highly trainable, reliable) tolerant of multiple behaviours (e.g., stemming behaviours, pinching, squeezing), and “bombproof.” Not surprisingly, these findings indicate that children with ASD are most likely to benefit from interacting with canines that are well-behaved and show high affinity for human social contact. Further, canines who exhibited dominant, possessive and/or aggressive temperament traits were described as being undesirable across cases. Although one family reported concerns over their canine’s temperament (case 5), neither dominance nor aggression problems were negatively associated with the child-canine bond. It should be noted that in this isolated case, the canine was only 8 weeks of age at the time of the interview. Therefore, the dominant, possessive and aggressive behaviours might have been exaggerated given the young age of the canine and lack of training at that time.

This finding highlights the notion that canines exhibit individual characteristics that affect their behaviour (Gosling, 2009). Although this family (5) had previous experience taking care of and bonding with their neighbours Goldendoodle, their Goldendoodle puppy exhibited behaviours that varied from their neighbours Goldendoodle. There is an erroneous tendency to generalize canine-related findings to canines as a species rather than canines as individuals (Coltea, 2011). This signifies that even canines from the same breed and in the same family may behave very differently from one another, highlighting the need for families to consider a canine’s individual characteristics when selecting a companion canine for their child with ASD.

5.2.2.4 Canine as Family Member

How the companion canine was situated in the family system appeared to impact the

strength of the child-canine bond. How the families treated and viewed their canine(s) appeared to influence how, in turn, their child(ren) with ASD viewed and treated the companion canine. In the families where the canine was viewed as a member of the family and included in day-to-day activities (e.g., sitting on the couch with the family, sleeping in the bed, included in family travel), a stronger child-canine bond was evident.

In case 1, the family owned several companion canines with which their son with ASD exhibited no particular interest towards. When they acquired their two companion canines following their son's ASD diagnosis they reported that "they were the first canines we had that we allowed to come up on the couch and cuddle." They offered that perhaps their son saw this interaction which helped establish a bond. This correlation is evidenced by Melson (2003) who suggested that parental influence needs to be investigated when looking at children's interactions with companion animals. Melson (2003) postulated that parents' attitudes shape children's relationships with others. When the parents viewed the canine as a family member they were more involved in their children's interactions with the companion canines. For example, the parents created the context in which their children interacted with their canines. The current study supports the view that children's bond with their canines are positively correlated with their parents' bonds suggesting that the parents' attitudes towards the companion canine(s) are mirrored by the children (Coltea, 2011). By families encouraging the canines' participation, the children with ASD appeared to develop a strong attachment relationship.

5.2.2.5 Family Profile

Welsh (2009) suggested that previous interactions with canines are important in defining individuals' present interactions with companion canines. This finding was evident in both the children with ASD and the parents. Children with ASD who had previous experience with

animals exhibited a strong bond with their companion canine(s). Previous experience was not limited to canines and did not require extensive involvement with animals however it was identified that the participating children who were accustomed to having other family pets and/or being around other pets formed a stronger bond with their companion canine.

Parental prior knowledge and experience appeared to influence canine selection, which, in turn, influenced the child-canine bonding process. Knowledge regarding canine behaviour, breed characteristics, and research on the therapeutic benefits canines can have on children with ASD, influenced the families decisions concerning canine selection. Families who reported positive previous experiences owning canines expressed a consistent understanding that a companion canine could provide therapeutic benefits for the family unit as well as children with ASD. A strong knowledge base and previous experience owning canines appeared to increase understanding regarding what type of canine would best suit their child's needs as well as fit with their family's lifestyle.

In addition to child previous experience and parental knowledge and experience with canines, family motivation also contributed to the child-canine bonding process. It has been established that motivation affects behaviour (Maehr & Meyer, 1997). Motivation directs behaviour, leads to increased effort and energy, and increases initiation and persistence in activities (Maehr & Meyer, 1997). Not surprisingly, when parental and familial motivation to integrate a canine into the family was shared and the motivation to acquire a canine was specifically for the child(ren) with ASD, a stronger child-canine bond was evident. Further, a stronger child-canine bond was evident when the children with ASD were excited about integrating a companion canine into the family home and demonstrated motivated behaviours (e.g., persistently asking for a canine, demonstrating responsibility for canine ownership, writing

out a list of things he/she will do to take care of the canine). It must be noted that children with more severe forms of ASD may lack the ability to display typical motivational behaviours due to deficits in social communication. This however, did not appear to decrease the likelihood of an attachment relationship forming between the child with ASD and the companion canines in case 1. Although child motivation emerged as a prevalent theme across most cases, it evidently cannot be generalized to all families impacted by ASD.

5.2.2.6 Familial Benefits and Positive Effects for the Children with ASD

Mentioned earlier in the Results chapter, benefits elicited by companion canines for families impacted by ASD was not initially intended to be a focal point in this study. However, positive influences identified from the presence of the companion canines were routinely discussed across cases and therefore could not be omitted from the study.

The children in this study benefitted from their companion canines in various ways, similar to what has been described in previous research (e.g., Carlisle, 2014; Bystrom & Personn, 2015). Many of the parents referenced that the canines' presence provided a sense of consistency for their children with ASD and supported them emotionally through companionship, unconditional love and stress relief. It has been identified in previous research that companion animals can provide socio-emotional support that facilitates coping, recovery, and resilience (e.g., Cain 1985). Bonds with pets offer comfort, affection, and sense of security which can reduce feelings of vulnerability, loneliness, or depression (Welsh, 2009). Families impacted by ASD also receive similar benefits. For instance, one of the family's (case 5) described how their children with ASD would often experience feelings of isolation due to difficulties establishing peer-peer relationships at school. Since acquiring their companion canine, they stated that their children now acquire socio-emotional support through the

unconditional love provided by the companion canine.

In addition to providing socio-emotional support, many of the parents reported that the companion canines' facilitated learning for their child(ren) with ASD. Although the children with ASD may have had difficulties understanding other people's perspectives and establishing attachment relationships outside of their immediate family, they were able to learn about emotions and attachment based from the experiences provided by their companion canines

A companion canine can be accepting, affectionate, loyal and consistent, qualities that are necessary to satisfy a person's basic need to be loved and feel self-worth (Nebbe, 2001). Many of the parents reported that their child(ren) with ASD were able to experience these feelings provided from their companion canine. For many of the children with ASD, experiencing a bi-directional attachment (i.e., a mutual interaction between the companion canine and the child. The child demonstrates attachment behaviours towards the companion canine and the companion canine demonstrates attachment behaviours towards the child) was a novel experience. Children with ASD often face challenges in establishing and maintaining social connections due to the social complexities often associated with peer-peer and peer-adult relationships, therefore, bonding with a companion animal might be easier to negotiate (Bystrom & Personn, 2015).

The child-canine relationship was often described as a strong, unique and deep connection. This is in accordance with Boris Levinson's (1969) theory of emotional relationships between children and animals and McNicholas and Collis's (2000) finding that people with autism may exhibit behaviours toward animals that they do not exhibit toward their family. The findings from the current study suggest that the child-canine bond is unique in the way that the children with ASD demonstrate more affectionate and positive social behaviours

than they do with people. This is in alignment with Baron-Cohen, Leslie, and Uta's (1985) theory of mind.

Baron-Cohen and colleagues (1985) postulate that children with autism face challenges in understanding thoughts different from their own. This has been suggested as one of the reasons children with autism have trouble negotiating peer-peer and peer-adult relationships. Although canines are interactive, children perceive them as non-judgemental participants and are not influenced by the expectations of typical human relationships (Friesen, 2010). The absence of the necessity to "read" a canine's mind may provide an explanation for the increased ability of a child with ASD to interact in a social way with a canine (Solomon, 2010). This unique interaction offers typical and atypical children a valuable form of social and emotional support (Friesen, 2010).

In addition to this unique child-canine connection, many of the parents reported that the interactions with companion canines facilitated considerable growth in the areas of emotion regulation, perspective taking, and empathy. These findings are significant given children with autism often have specific deficits in these areas (Baron-Cohen & Wheelwright, 2004). Baron-Cohen and colleagues (1985) posit that children with autism may have a severe deficit in empathy which underlie difficulties in social interaction. The companion canines in the current study appeared to develop empathy in the children with ASD which may have contributed to their ability to take perspective and recognize the needs of others which in turn, increased social interactions. This ability to think of others was also enabled through the responsibilities associated with caring for an animal. Responsibility-based relationships require the ability of the individual to think of and recognize the needs of others based on contextual information as well as expressions, words and/or actions (Smith, 2006). Caring for a companion animal requires the

ability to recognize the animal's needs without the use of verbal communication. Parents reported that by having their child(ren) with ASD care for their companion canine(s) they saw a substantial increase in maturity, responsibility, and capability. Caring for another living being requires the ability to think of others, which can be a difficult issue for children with ASD, signifying the significance of this finding. Although the companion canine initiated these positive developmental changes they were reportedly transferred to other areas in their lives including peer-peer and peer-adult relationships.

Interestingly, social skills development was evident across cases. The companion canine provided consistency for the children with ASD reducing their feelings of anxiety during stressful situations. With a reduction in anxiety, the children may have become more willing to engage in activities outside of their home increasing their opportunities to expand their social world. In addition to reducing anxiety, the presence of the companion canines also appeared to reduce social barriers. The canine would often attract their peers and other people in public settings which, in turn, provided an opportunity for the children with ASD to practice social skills. Furthermore, the children with ASD were often described by the parents as being proud of the canine. The canines were a comfortable and socially acceptable topic to discuss, for children with verbal skills, this pride often resulted in the children wanting to "show off" their canine which in turn, enabled social interactions.

Perhaps the most significant positive impact on the family systems were the canines' role in managing behavioural challenges (e.g., emotional breakdowns/tantrums, resistance to change, and tolerance). The canines acted as a form of support for the children with ASD which appeared to alleviate some of the negative outcomes for the parents. Researchers examining coping strategies for families impacted by autism emphasize the importance of helping parents

develop coping strategies that reduce strain on the family (Sivberg, 2002). In the current study, the parents reported that the presence of the companion canine has encouraged normalization of day-to-day living in the home and in the community. Previous research by Burrows and colleagues (2008) examining how autism trained service canines impact the family system are in alignment with the current study in that the companion canines also provided family independence and functioning. Interventions that maximize the family's independence and functioning are two important components needed to help families impacted by autism cope with autism. Typical activities such as driving in the car, recreational activities, and social outings were all facilitated by the companion canine(s). The presence of the companion canines appeared to have a calming effect on the children with ASD which reduced the occurrence of emotional breakdowns.

5.2.2.7 Miscellaneous themes

Given the inevitable changes that occur (e.g., changes to daily routines and changes to the family system) when integrating a companion canine into the family home, some children with ASD may take longer to become accustomed to the new addition. One family in particular (case 1) reported that an "incubation time" of approximately six weeks occurred before any evidence of a bond being established. Given this capriciousness, families impacted by autism who are considering acquiring a companion canine for their child with ASD should be aware that the timing to establish a bond can vary across cases.

Another interesting theme that emerged in a discussion with case 1 was their child's acceptance of sensory contact from the canines that would not normally be accepted from another human being. This finding was termed as a bi-directional effect. Described earlier in the Results section, the canines in this study tolerated multiple and unpredictable behaviours

characteristic of children with ASD. In turn, the children accepted affectionate behaviours from the canines (e.g., licking, nudging, pawing, barking) that would normally not be accepted or tolerated. Currently there is no evidence in the literature to explain this phenomenon.

Children with ASD often exhibit highly restricted, fixated interests that are heightened in intensity or focus; such as a strong attachment to or preoccupation with unusual objects, or excessively circumscribed or perseverative interests (DSM-5; American Psychiatric Association, 2013). It became evident that these competing interests (e.g., tech gadgets) may usurp interactions with companion canine. Therefore, early-on in the canine acquisition phase, families may want to consider limiting competing interests that could potentially detract from interactions with the companion canine and consequently, the bonding process.

5.2.3 Limitations

The findings should be considered in light of several limitations. First, the use of a relatively small sample size narrows the frame of reference for this study and limits the ability to wholly represent this population. Although small sample sizes are considered to be appropriate for qualitative research (Patton, 2002), this is a limitation that is important to consider when reading this study, as these findings may not be representative of all families with a child on the autism spectrum and a family companion canine. Considering too that families self-selected for participating in this study. Furthermore, only families who reported a strong child-canine bond were included in the study. It is possible that if families who reported a weak child-canine bond were included, comparisons could be made and additional themes may have emerged.

As with any research study, there were inherent time constraints to conduct the study. In addition, the interview style of data collection has inherent limitations as it is subject to the biases of the both interviewer and the participating subjects. In order to include the children

themselves and reduce potential bias, the researcher collected observational data of child-canine interactions. Although observational data was collected throughout the interview process, it was difficult to perfectly time a natural interaction between the child(ren) with ASD and the companion canine(s). Furthermore, this study was limited to being conducted within the homes of each participating family. Examining this unique relationship in a variation of contexts (contexts outside of the home) may provide further insights into the child-canine bonding process in children with ASD.

In addition, when identifying what, if any, features of attachment were evident in the child-canine relationship, observational data of secure base was limited due to the time constraints of the study (e.g., observational data was collected at one time point and in the families homes rather than multiple times in multiple locations). Additionally, on multiple occasions during the analyses, the researcher found it difficult to differentiate between safe haven codes and secure base codes. Furthermore, the identification of separation anxiety was complicated due to the fact that most of the children with ASD were never separated from their companion canine and parental reports were relied upon. Moreover, length of companion canine ownership varied between families. This variation made it difficult for a few of the families to accurately answer some of the interview questions (e.g., when case 5 was asked whether their children with ASD seek comfort from their canine when upset the parents reported that there has not been an opportunity to observe that interaction since they only recently acquired the companion canine).

5.2.4 Implications

This exploratory case study is a contribution to the limited human-animal bond literature examining child-canine bonding in children with ASD. The intent of this study was to contribute

knowledge that service providers and families who are impacted by ASD might draw upon when considering integrating a companion canine into the care plan. The most pressing implications of this study's findings for theory, practice, and research will be presented in the following sections.

5.2.4.1 Implications for Theory

Both Bowen's family systems theory and Bowlby's attachment theory were used to guide the current study. Given that the family system is the most influential system for typical children (Bronfenbrenner, 1979) and subsequently, for children with ASD (Cridland et al., 2014), this study demonstrates the value of utilizing a family systems approach as a guiding framework for family-focused ASD research. In a review by Cridland and colleagues (2014), the authors highlight the need to conduct family-focused ASD research in order to increase our understanding of the impact of ASD and inform support services for these families. In addition to providing a framework to conduct this study, family functioning and how the companion canines were situated within the family systems appeared to impact the strength of the child-canine bond. This finding highlights the notion that "research focusing on within families is critical for developing an understanding of how to best support families living with ASD (Cridland et. al., 2014, p. 214)." Applying a family systems approach when conducting research on the impact of both formal and informal support services for children with ASD sheds light on the importance of how these services are situated within the family unit (Heiman & Berger, 2007). This study provides evidence that using family systems theory is an appropriate, and perhaps critical, approach to drive and inform future family-focused ASD research.

In addition to Bowen's family systems theory, Bowlby's attachment theory proved to be an appropriate framework to categorize child-canine bonding in children with ASD. Studies investigating human-animal bonding using Bowlby's attachment theory have been conducted

and its application has been successful (e.g., Beck & Madresh, 2008; Kurdek, 2008; Kwong, 2007). Despite its application on previous studies examining human-animal bonding, to date, this is the first study to utilize Bowlby's attachment theory to investigate the relationships between children with ASD and their companion canine. The results from the current study suggest that the bond between children with ASD and their companion canine has the potential to fulfill the same attachment functions as human relationships. This study provides evidence that Bowlby's attachment theory is an appropriate framework when examining human-animal bonding in children with ASD which, in turn, will inform future research in this field.

5.2.4.2 Implications for Practice

Emergent themes identified in this study suggest that there are several benefits to having a companion canine in the family system of the child with ASD that extends to the family unit. This data contributes to existing literature on the therapeutic benefits of the human-animal bond for children with ASD and can be used to further understand the social and emotional benefits of having a companion canine, particularly for families faced with the unique stressors of having a child with autism. From an applied perspective, these findings invite service providers working with children with ASD to support families in exploring this possibility. In addition, the findings inform parents seeking to support their children through the addition of a companion canine. The findings from this line of research have scope to inform parents and help ensure a strong child-canine bond is established. There are familial, social, and economic ramifications arising from increasing awareness of the factors in children, in companion canines, and within families that nurture successful child-canine bonds which warrants the need for further investigations.

5.2.4.4 Implication for Future Studies

The findings from the current study converge to suggest that companion canines can fulfill attachment needs for children with ASD. These findings highlight the challenges faced by families who decide to integrate a companion canine into the care plan for their child with ASD due to social policies that place restrictions on companion canines. For example, given that acquiring a companion canine for a child with ASD is such a new phenomenon, there are currently no policies in place to allow companion canines into the school system. This issue was raised by multiple families in the study. Research in applied settings such as schools could increase awareness regarding the familial, social, and economic benefits of acquiring a companion canine for a child with ASD. In addition, future research could help inform policy makers and educators so that the challenges are minimized and allowances could be made to bring a companion canine into a classroom setting.

Furthermore, the findings advance future studies in the field of HAI by informing researchers about the nuanced interactions taking place within family contexts that facilitate child-canine bonding and provide insights into the factors that influence this bonding process. Given the need for alternative therapies and interventions for children with ASD, the accessibility and feasibility of acquiring a companion canine over a trained autism service canine, and the merits of acquiring a companion canine for children with ASD, further research is warranted. This study encourages the exploration of alternative family-based support for families impacted by ASD that may extend beyond the existing conventional practices. The process of acquiring a companion canine that meets the needs of the family and the child with ASD as well as implementing strategies to encourage a strong child-canine bond may be a critical piece in the success of the child-canine bond. Future studies are warranted to examine further elements of this process and their outcomes.

Finally, future studies examining bonding in children with ASD are needed to fully understand this unique relationship. To date, studies investigating child-canine bonding in children diagnosed with level- 3 ASD have not been identified. It is recommended that researchers who seek to examine this phenomenon in children with a more severe ASD diagnosis and who may be non-verbal, immerse themselves in the field longer and continue to utilize observation as a primary research tool to identify the nuanced interactions that exist to indicate the presence or absence of bonding (e.g., proximity and initiations of interactions and touch).

5.2.5 Conclusion

Autism is the most common neurological disorder affecting children (Center for Disease Control and Prevention, 2014) and therefore, there remains a critical need for further studies to investigate the effectiveness and successful implementation of therapeutic interventions for this population. Human-animal therapeutic interventions have only recently become recognized and appreciated for the beneficial effects the human-animal bond and more specifically, the child-canine bond, can have on children with ASD. The findings of this study provide important suggestions for how families impacted by ASD can integrate a companion canine into the care plan and help facilitate a strong child-canine bond.

The present study demonstrated that children with ASD may be capable of forming an attachment relationship with their companion canine. For children with ASD, having the ability to bond with a companion canine is significant given this population often faces challenges establishing relationships which can lead to social isolation and feelings of loneliness (Ekas & Whitman, 2011; O'haire, 2013). The child-canine bonding experience was reportedly associated with positive emotions that align with that of an attachment relationship (e.g., empathy, love, trust, joy). These positive emotions provided an opportunity for the children with ASD to

experience attachment outside of their immediate family which, in turn, increased their likelihood of establishing peer-peer and peer-adult relationships. Thus, developing a relationship with a companion canine may help children with ASD to develop a capacity to trust and care for others that may generalize to human relationships. Although the strength of attachment varied among cases, the social and emotional benefits of having a family companion canine were still evident.

Themes and subthemes identifying factors that contributed to, or detracted from, the child-canine bonding process emerged through the collection of interview and observational data. These emergent themes provide insights into the phenomenon of child-canine bonding in children with ASD and can be used to further understand how to facilitate a strong child-canine bond. To date, this is the first study to examine and identify characteristics of the child, characteristics of the companion canine, characteristics of the family unit, and other personal and external factors that might influence the bonding process in children with ASD. Although the present study provides insights into the factors influencing this unique bond, future studies are needed to fully understand this complex relationship. The integration of a companion canine for a child with ASD is a relatively untapped source of support to effectively and positively impact the social and emotional well-being of children with ASD as well as their families.

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Appendices

Appendix A – Consent Form



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Consent Form for Primary Caregiver(s)

Research Project Title: *Bonding in Children with ASD: Findings within and Across Case Studies*

Study Team:

Principal Investigator: Dr. John Tyler Binfet, Ph.D.
Assistant Professor
Faculty of Education
University of British Columbia, Okanagan Campus

Co-Investigator: Kathryn Struik, BScHK
M.A. Student in the Faculty of Education
University of British Columbia, Okanagan Campus

Purpose of the Study:

This study is being conducted by Kathryn Struik (researcher) under the supervision of Dr. John Tyler Binfet, as part of the requirement for the Masters of Arts program in the Department of Education at the University of British Columbia, Okanagan Campus. The purpose of this study is to learn about the relationship between your child with autism and the companion canine. The final

master's thesis document will be available as a public document through the University of British Columbia and on the internet through cIRcle. Results will be prepared into a thesis document, reports, scientific papers, and presentations. If you or your child feel uncomfortable participating in this study you can stop participating at any time. **Your participation in this study is voluntary. You or your child may decide not to participate or you may withdraw from the study at any time and it will not impact you or your child in any way.** If you withdraw from the study, you may elect to withdraw any or all of the information you have provided.

Study Procedures:

If you agree to participate in this study, you and the researcher will schedule a time and date for a pre-visit. The purpose of the pre-visit is for the researcher to introduce herself to you, your child with ASD, your family, and your companion canine. In addition, the researcher will collect and authorize the consent forms. You will then be asked to complete a short questionnaire that asks demographic questions. It is anticipated that the pre-visit will take 30-60 minutes. Once the consent form is explained and the demographic information is collected, you and the researcher will schedule a time and date that is representative of a **typical** experience for you, your child with ASD, and your canine companion, to conduct the interview and collect observational data. For the study, you will be asked to participate in a 60 minute audio-taped interview focusing on the relationship between your child with autism and the companion canine. The interview will be audio-recorded for accuracy purposes only and the recording will be destroyed upon completion of the study. However, if you prefer to not have your interview audio-recorded, the researcher will take notes throughout the interview process. You can refuse to answer any questions that you do not feel comfortable answering. In addition to the interview, the researcher will collect observational data of child-canine interactions. Observational data will be representative of a

typical experience shared between your child with autism and the companion canine. It is anticipated that it will take approximately 30 minutes to collect sufficient observational data.

Risks:

This study includes no risks greater than what one would experience in their daily life. We do not think there is anything in this study that could harm you or be bad for you. Please let one of the study staff know if you have any concerns. Some of the research questions may seem sensitive or personal. While we do not anticipate that any questions will upset you, if they do, you can take a break, withdraw from the study, or not answer any questions you do not want to.

Potential Benefits:

You may not receive any direct benefits for participating in this study, however, the information you provide will assist in providing insights into what influences the bonding process between a child with ASD and the companion canine. This holds the potential to advance not only an understanding of autism but also inform researchers about the nuanced interactions taking place within family contexts that facilitate child-canine bonding. This information can help direct further research and inform parents seeking to support their children through the addition of a companion canine.

Remuneration:

As a token of appreciation for participating in the study, each participating family will receive \$30.

Confidentiality:

Any information provided by you to the researchers will be kept strictly confidential. The identity of participants will be protected using pseudonyms. Anything linking your name to the research materials will be stored in locked filing cabinet accessible only to my supervisor and myself. The data will be stored at UBC for five years following publication and will then be destroyed.

For More Information:

If you require any additional information about this study or have any questions, please feel free to contact either:

Kathryn Struik, Principal Investigator

Phone: 250-300-4288

email: kathrynstruik@gmail.com

OR

Dr. John Tyler Binfet, Supervisor

Phone:

email: johntyler.binfet@ubc.ca

Contact for Concerns:

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Services at 1-877-822-8598 or the UBC Okanagan Research Services Office at 250- 807-8832. It is also possible to contact the Research Participant Complaint Line by email (RSIL@ors.ubc.ca)

Consent:

- I have read and understand this consent form.
- I have received a copy of this consent form.
- I consent / I do not consent to my child's participation in this study (circle one).
- I consent to the audio recording of this interview / I do not consent to the audio recording of this interview and would prefer the researcher to take notes instead (circle one).

- I consent to the visual recording of this study (e.g., observations).
- I consent to all other methods of data collection (e.g., paper-and-pencil, questionnaires, and interviews).
- I consent to participate in this study.

Signature _____ Today's Date _____

Printed Name _____

Researcher's Signature _____ Date _____

Request for follow-up information:

I would like to receive a copy of the brief report of findings and results from the study.

Yes _____

No _____

Please send the report to:

Name: _____

Mailing Address: _____

Postal Code: _____

Appendix B– Consent Form



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THE UNIVERSITY OF BRITISH COLUMBIA

Consent Form for Participants Involved in Naturalistic Observation

Research Project Title: *Bonding in Children with ASD: Findings within and Across Case Studies*

Study Team:

Principal Investigator: Dr. John Tyler Binfet, Ph.D.
Assistant Professor
Faculty of Education
University of British Columbia, Okanagan Campus

Co-Investigator: Kathryn Struik, BScHK
M.A. Student in the Faculty of Education
University of British Columbia, Okanagan Campus

Purpose of Naturalistic Observations:

This study is being conducted by Kathryn Struik (researcher) under the supervision of Dr. John Tyler Binfet, as part of the requirement for the Masters of Arts program in the Department of Education at the University of British Columbia, Okanagan Campus. The purpose of the naturalistic observations are to observe the interactions shared between the child with ASD and the companion canine. The final master's thesis document will be available as a public document

through the University of British Columbia and on the internet through cIRcle. Results will be prepared into a thesis document, reports, scientific papers, and presentations. If you feel uncomfortable participating in this study you can stop participating at any time. **Your participation in this study is voluntary. You may decide not to participate or you may withdraw from the study at any time and it will not impact you in any way.** If you withdraw from the study, you may elect to withdraw any or all of the information you have provided.

Naturalistic Observation Procedures:

Observational research is defined as research which does not involve direct interaction or contact with participants outside of their typical, daily routine and activities. Observational data will be representative of a typical experience shared between a child with autism and their companion canine. If you wish take part in these observations, written consent by you or your parent/guardian (if under the age of 19) is required. The researcher will take hand-written notes of observational data, however, you will not be identified by name. It is anticipated that it will take approximately 30 minutes to collect sufficient observational data.

Risks:

This study includes no risks greater than what one would experience in their daily life. We do not think there is anything in this study that could harm you or be bad for you. Please let one of the study staff know if you have any concerns. While we do not anticipate that the observational research will upset you in any way, if it does, you can take a break or withdraw from the study at any time.

Potential Benefits:

You may not receive any direct benefits for participating in this study, however, the information you may provide will assist in providing insights into what influences the bonding process between a child with ASD and the companion canine. This holds the potential to advance not only an

understanding of autism but also inform researchers about the nuanced interactions taking place within family contexts that facilitate child-canine bonding. This information can help direct further research and inform parents seeking to support their children through the addition of a companion canine.

Remuneration:

As a token of appreciation for participating in the study, each participating family will receive \$30.

Confidentiality:

Any information provided by you to the researchers will be kept strictly confidential. The identity of participants will be protected using pseudonyms. Anything linking your name to the research materials will be stored in locked filing cabinet accessible only to my supervisor and myself. The data will be stored at UBC for five years following publication and will then be destroyed.

For More Information:

If you require any additional information about this study or have any questions, please feel free to contact either:

Kathryn Struik, Principal Investigator

Phone: 250-300-4288

email: kathrynstruik@gmail.com

OR

Dr. John Tyler Binfet, Supervisor

Phone:

email: johntyler.binfet@ubc.ca

Contact for Concerns:

If you have any concerns or complaints about your rights as a research participant and/or your

experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Services at 1-877-822-8598 or the UBC Okanagan Research Services Office at 250- 807-8832. It is also possible to contact the Research Participant Complaint Line by email (RSIL@ors.ubc.ca

Consent:

- I have read and understand this consent form.
- I have received a copy of this consent form.
- I consent to the visual recording of this study (e.g., observations).
- I consent to participate in this study.

Signature _____ Today's Date _____

Printed Name _____

Researcher's Signature _____ Date _____

Consent for Children Under 19:

- I understand that the study has been explained to me and my child.
- I understand that I may refuse to have my child participate without any consequences.
- I understand that I and my child will receive a signed copy of this consent form.
- I understand that my child's identity will be kept confidential.

I hereby consent to have my child, _____ participate in the naturalistic observations of this study.

Signature of Parent or Guardian _____

Printed Name _____

Today's Date _____

Researcher's Signature _____ Date _____

Request for follow-up information:

I would like to receive a copy of the brief report of findings and results from the study.

Yes _____

No _____

Please send the report to:

Name: _____

Mailing Address: _____

Postal Code: _____

Appendix C– Verbal Assent Form



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THE UNIVERSITY OF BRITISH COLUMBIA

Verbal Assent Form for Children with ASD

Research Project Title: *Bonding in Children with ASD: Findings within and Across Case Studies.*

Study Team:

Principal Investigator: Dr. John Tyler Binfet, Ph.D.
Assistant Professor
Faculty of Education
University of British Columbia, Okanagan Campus

Co-Investigator: Kathryn Struik, BScHK
M.A. Student in the Faculty of Education
University of British Columbia, Okanagan Campus

Why am I here?:

I am here to learn about the relationship between children with autism and their canine. You are invited to be in this study because we want to see how children with autism who live with a family canine bond with their canine.

What will happen?:

I will just be here to hang out with you and your canine.

Your identity will be kept a secret.

You will not be asked any questions but you can feel free to ask me any questions or tell me anything about your canine.

You can ask now. You can ask later. You can ask me or you can ask your parents.

Sometimes having people around can be stressful. If you want to be alone, take a break, or stop hanging out with me, it is OK.

If you change your mind about the study you can quit at any time.

You should tell me or your parents if you feel bad. If you do not want to be in the study you just have to tell me or your parents, no one will be mad at you.

How You Can Help!:

By studying how children with autism bond with their canine we may find out what causes this bond to develop.

Assent:

I want to take part in this study. I know I can change my mind at any time.

_____ Verbal assent given Yes
Print name of child

[The following statement and signature is required]:

I confirm that I have explained the study to the participant to the extent compatible with the participants understanding, and that the participant has agreed to be in the study.

**Printed name of
 Person obtaining assent**

**Signature of
 Person obtaining assent**

Date

Appendix D– Verbal Assent Form



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 THE UNIVERSITY OF BRITISH COLUMBIA

Verbal Assent Form for Children Involved in Naturalistic Observation

Research Project Title: *Bonding in Children with ASD: Findings within and Across Case Studies.*

Study Team:

Principal Investigator: Dr. John Tyler Binfet, Ph.D.
 Assistant Professor
 Faculty of Education
 University of British Columbia, Okanagan Campus

Co-Investigator: Kathryn Struik, BScHK
 M.A. Student in the Faculty of Education
 University of British Columbia, Okanagan Campus

Why am I here?:

I am here to learn about the relationship between children with autism and their canine. We want to see how children with autism who live with a family canine bond with their canine. You can also be included in this study!

What will happen?:

I will just be here to hang out and watch how a child with autism interacts with a canine.

If you are a going to be there while I hang out, I need your permission to be a part of the study!

Your identity will be kept a secret.

You will not be asked any questions but you can feel free to ask me any questions.

You can ask now. You can ask later. You can ask me or you can ask your parents.

If you change your mind about the study you can quit at any time.

You should tell me or your parents if you feel bad. If you do not want to be in the study you just have to tell me or your parents, no one will be mad at you.

How You Can Help!:

By being a part of this study you may help us find out what causes a bond to develop between a child with autism and a companion canine.

Assent:

I want to take part in this study. I know I can change my mind at any time.

_____ Verbal assent given Yes
Print name of child

[The following statement and signature is required]:

I confirm that I have explained the study to the participant to the extent compatible with the participants understanding, and that the participant has agreed to be in the study.

**Printed name of
 Person obtaining assent**

**Signature of
 Person obtaining assent**

Date

Appendix E – Primary Caregiver of Child with ASD: Demographic Survey

The questions in this demographic survey are about you, your family, your child with ASD and your companion canine.

PARTICIPANT SURVEY

Researcher's Initials _____

Instructions:

- Please answer ALL of the questions listed below.
 - For questions followed by a solid line, please write your answer on the solid line.
 - If you have any questions or comments about this survey, don't hesitate to let us know.
-

Section A: About You and Your Family

1. Please choose a pseudonym:
 - Mother
 - Father
 - Other _____
2. What year were you born? _____
3. Sex
 - Male
 - Female
4. How many children do you have? _____
5. Are you:
 - Married
 - Partnered
 - Widowed
 - Divorced
 - Separated
 - Never married
6. What is the highest level of education that you have completed?

- Less than High School
- Completed High School
- College or Technical Degree/Certificate
- Undergraduate Degree
- Masters' Degree
- Doctoral Degree
- Other _____

7. What is your current occupation? _____

8. How would you describe yourself?

- White/Caucasian
- Black
- Korean
- Aboriginal/First Nation
- Filipino
- Chinese
- Japanese
- South Asian
- Arab/West Asian
- Latin American
- Other _____

9. What language do you speak most often at the home you are living in?

- English
- Other _____

10. Do you speak other languages at home on a regular basis?

- Yes _____
- No

Section B: About Your Child with ASD

1. Child's age? _____

2. Child's Sex

- Male
- Female

3. How would you describe your child's ethnicity?
- White/Caucasian
 - Black
 - Korean
 - Aboriginal/First Nation
 - Filipino
 - Chinese
 - Japanese
 - South Asian
 - Arab/West Asian
 - Latin American
 - Other _____
4. Child's ASD diagnosis (e.g., low functioning, high functioning, etc.):

5. Does your child take any medications related to their ASD diagnosis?
- Yes
 - No
6. If your child does take any medications related to their ASD diagnosis please list.

7. How old was your child with ASD when you got your canine(s)?

8. How attached is your child with ASD to your canine?
- Not very attached
 - Attached
 - Very attached

Section B: About Your Companion canine

1. Where did you get your canine (e.g., breeder, local animal shelter, online advertising site)? _____

2. What breed of canine do you have? _____
3. What is the age of your canine? _____
4. How long have you owned your canine? _____

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS SURVEY!

Appendix F – Parent Interview Guide

Overarching research questions guiding the study.

1. How does the child interact with the canine?
2. What is the quality of the relationship between the child and canine?
3. Is there evidence that the attachment components of safe haven, secure base, proximity seeking, and separation anxiety are evident features of the child-canine relationship? If so, to what extent are these four features of attachment evident?
4. What strategies, if any, did parents implement to facilitate a child-canine bond?

Open by reminding them of the aim of the study.

First of all, thank you again for your enthusiasm to participate in this study. As outlined in the consent form, this study is aimed at understanding how children with autism bond with their companion canine. I am curious to find out what factors might have influenced this bond as well as what, if any, strategies were used to help nurture a strong canine-child bond. Your input is critical to help us better understand human-animal bonding in children with autism as well as understand how to facilitate a strong canine-child bond and inform parents seeking to support their children through the addition of a companion canine. We will now have about a 1 hour discussion about the relationship shared between your child and the companion canine. And just a quick reminder: these interviews are being audio-recorded and will be transcribed later. Before we begin the interview, I just want to reiterate that any information provided by you will be kept strictly confidential. Information I put in my report that could identify you will not be published or shared beyond the research team unless we have your permission. **Your participation in this study is voluntary. You may decide not to participate or you may withdraw from the study at any time and it**

will not impact you in any way. If you withdraw from the study, you may elect to withdraw any or all of the information you have provided.

This study has been reviewed and cleared by UBC Okanagan's Research Ethics Board.

Now, before we begin, do you have any questions or would you like any additional details? And I have to ask one last time: Do you agree to participate in this study knowing that you can withdraw at any point with no consequences to you?

Canine related questions:

Ask the participants to reflect on their experiences when they first bought the canine and describe what features/characteristics influenced their decision to buy that particular canine.

1. When did you get (name of canine)?
2. Looking back to when you first brought (name of canine) home, could you tell me what drew you to getting (name of canine) versus any of the other canines you perhaps looked at?
 - What did you and your family like the most about (name of canine)?
3. What is the most striking characteristic of your canine?
4. How would you describe your canine's temperament?
 - Could you tell me a little more about your canine? What comes to your mind first?

Parent related questions:

Ask them to reflect on what motivated them to get a canine.

5. We know that getting a canine is often a big decision for any family to make. What or who influenced your decision to get a canine? *Let the conversation unfold noticing what is talked about. When there is a pause use the following prompts to further direction:*
- Whose idea was it to get (name of canine)?
 - What motivated you to get a canine?
 - What, if any, previous knowledge regarding the potential benefits of owning a companion canine for a child with autism did you have?
 - Was your child involved in the canine-buying process? If so, in which ways?

Ask them to think about what ways they may have tried to encourage a bond between their child with autism and the companion canine.

6. How did you try and facilitate a bond between your child and (name of canine)?
- What strategies, if any, did you implement?

Child related questions:

Ask them to think about and reflect on, their child's relationship with the companion canine.

7. During a typical day, could you describe how your child interacts with the canine?
- When did your child first interact with (name of canine)?
8. Could you describe how your child is involved with the care of (name of canine)?
9. Could you describe the quality of the relationship between your child and the canine?

Attachment related questions:

Explain to the participants that you are now going to ask questions which are guided by attachment theory, to gather insights regarding their child's attachment to the companion canine.

10. Who does your child seek comfort from when upset? **Safe Haven**

- How comforting is the canine for your child when he/she is upset?

11. How has the canine influenced your child's willingness to engage in situations that might otherwise be stressful for her/him? **Secure Base**

- To what extent does (name of canine) calm your child during potential stressful situations and/or changes in routine?

12. How does your child cope when he/she is away from the canine? **Separation Anxiety**

- What is it like for your child to be away from (name of canine)

13. During a typical day, who does your child spend the most time with? **Proximity**
Maintenance

- How much time does your child like to spend with (name of canine)?

Conclude interview:

14. Is there anything important to tell me about your child's bond with (name of canine) that was not discussed during this conversation?

- Do you have any questions or comments about the interview?



Currently recruiting: Human-Animal Bonding in Children with ASD

What is the study about?

We are interested in studying how children with autism bond with their companion canine. Families who have a child with autism spectrum disorder (ASD) and a companion canine will participate. The purpose of this research is to identify what factors might influence children on the spectrum's ability to bond with their companion canine. This study is part of research being conducted for a master's thesis by Kathryn Struik. Kathryn Struik is directing the study under the supervision of Dr. John Tyler Binfet, director of UBC's Building Academic Retention through K9's (B.A.R.K.) canine therapy program and Professor at the University of British Columbia's Okanagan campus.

Why should I take part?

Autism is the most common neurological disorder affecting children. Companion canines have the potential to represent an effective tool to diminish the withdrawal of children with ASD by targeting the core symptoms of the disorder (e.g., impairments in verbal and nonverbal communication, social interactions and restricted patterns of behaviour). Despite enthusiasm for integrating companion canines into the care plan for children with ASD, little is known about how children with ASD form attachment bonds with their companion canine. For example, we lack an understanding of what might influence a child with ASD to bond with his/her companion canine and what, if any, strategies are used by families to ensure this bond is established and nurtured. This leads to questions about what might contribute to or detract from the bonding process and how families impacted by autism help ensure a strong canine-child bond. In order to successfully integrate a companion canine into a home environment, an understanding of the many personal and external factors influencing this interactive relationship is essential.

Your participation will help us better understand bonding in children with autism. The findings of this study will provide insights into what influences the bonding process between children with ASD and their companion canine. In addition, this study holds promise to inform researchers about the interactions taking place within family contexts that facilitate a strong child-canine bond as well as inform parents seeking to support their children through the addition of a companion canine.

Who can participate?

- Families with a child aged 5-14 years with autism and their companion canine

*Family canines will be restricted to companion pets with no formal therapeutic or service training. (standard obedience training is permitted).

What will we do?

- A brief questionnaire will be administered in order to obtain demographic information about yourself, about your child's ASD diagnosis and previous experience with animals, and about your companion canine.
- A 1 hour interview focusing on the relationship shared between your child with ASD and the companion canine will be conducted.
- 15-30 minutes of observation of child-canine interactions will be noted.
- In appreciation for your time, you will receive \$30

Where will it be conducted?

- This study will be conducted in your home and scheduled at your convenience.

Who can I contact?

For more information, please contact Kathryn Struik at 250-300-4288, or email at ubccaninestudy@gmail.com

Appendix H – Recruitment Flyer



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA



CHILD AUTISM RESEARCH STUDY

Do you have a child with autism or know a family who has a child with autism and a companion canine?

About the study

We want to learn about bonding between a child with autism and his/her companion canine and identify factors that influence the quality of the bond.

HELP US BETTER UNDERSTAND BONDING IN CHILDREN WITH AUTISM

What is involved?

Who?

Families with a child aged 5-14 years with autism and their companion canine.

* Family canines will be restricted to companion pets with no formal therapeutic or service training. (standard obedience training is permitted)

What?

- A 1 hour interview
- 30 minutes of observation of child to canine interactions
- In appreciation for your time, you will receive \$30

Where?

In your home and scheduled at your convenience.

Want to know more? If you have any questions or if you would like to consider your family for participation in the study please contact us at: ubccaninestudy@gmail.com or Dr. John-Tyler Binfet johntyler.binfet@ubc.ca.

DEADLINE TO ENROLL IN STUDY: November 15

Appendix I – Observational Data Map

Map of the Setting-Observational data

Code:

Date:

Location:

Duration:

Physical setting:

Attendees:

Child-canine activities/interactions:

Child-canine physical nearness:

Emotional disposition of child:

Comfort level of child:

Child openness:

Canine behaviour:

Other notable features/comments: