

**Animal Assisted Therapy for Children and Adolescents with
Autism Spectrum Disorder: Parent Perspectives**

Maeve Doyle Condon, MOT

Supervisors:
Dr. Lynette Mackenzie
Dr. Meryl Lovarini

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Table of Contents

Acknowledgements.....	02
Table of Contents.....	03
List of Tables.....	04
List of Figures.....	05
Abstract.....	06
Section One: Literature Review.....	07
1. Introduction.....	07
1.1 Aim of Literature Review.....	07
1.2 Database Search Method.....	07
2. Autism Spectrum Disorder.....	07
3. Parenting with Autism Spectrum Disorder.....	09
3.1 Parenting and ASD: Positive Parenting Experiences.....	09
3.2 Parenting and ASD: Stress.....	09
3.3 Parenting and ASD: Balancing Multiple Roles.....	10
3.4 Parenting and ASD: Stigma.....	11
3.5 Parenting and ASD: Service Provision.....	11
4. Interventions for Autism Spectrum Disorder.....	11
5. Animals in Health Care.....	13
5.1 Animal Assisted Therapy.....	13
6. Animal Assisted Therapy for Autism Spectrum Disorder.....	14
6.1 Why Dogs?.....	14
6.2 The Impact of Dogs of Communication and Social Interaction.....	14
6.3 The Impact of Dogs on Regulation.....	16
7. Parent Perspectives on Animal Assisted Therapy for Autism Spectrum Disorder.....	17
8. Conclusion.....	18
9. Proposed Research.....	19
10. References.....	20
Section Two: Journal Manuscript.....	25
Abstract.....	26
Introduction.....	27
Methods.....	28
Results.....	32
Discussion.....	41
Conclusion.....	44
References.....	45
Appendices.....	47
Appendix A: Participant Information Sheet.....	47
Appendix B: Participant Consent Form.....	51
Appendix C: Interview Schedule.....	53
Appendix D: Ethics Approval: University of Sydney.....	55
Appendix E: Journal of Autism and Developmental Disorder Author Guidelines.....	58
Figures Caption Sheet.....	66
Figures.....	67
Tables.....	68
Table 1. Demographics.....	68
Table 2. Reported Symptoms.....	69
Table 3. Reported Therapies.....	70
Authors Note.....	71

List of Tables

Journal Manuscript

Table 1. Demographics

Table 2. Reported Symptoms

Table 3. Reported Therapies

List of Figures

Journal Manuscript

Figure 1. Results Tree

Abstract

Animal Assisted Therapy for Children and Adolescents with Autism Spectrum Disorder: Parent Perspectives

Background/aim: Autism Spectrum Disorder (ASD) is a congenital neurodevelopmental diagnosis that requires tailored interventions to address complex symptom presentations. Animal Assisted Therapy (AAT) is a promising intervention for ASD that currently lacks sufficient research. Parents are often responsible for intervention protocols for their children and are in the best position to reflect on the strengths and challenges of this burgeoning intervention. The aim of this study is to better understand the impact of AAT from the perspective of parents whose children participated in five AAT sessions with an occupational therapist in Sydney, Australia.

Method: A phenomenological qualitative approach was taken to explore first-hand parent perspectives. In-depth, semi-structured interviews were conducted and a thematic analysis was consensus coded in NVIVO.

Findings: Seventeen parents participated in the study. Participants reported the presence of the dogs engendered engagement, enjoyment, and motivation within their children. This reportedly benefited communication, regulation, and community access.

Conclusion: This study found support for use of AAT for children with ASD. Therapy dogs' unique characteristics as nonverbal and nonjudgmental therapy partners act to facilitate motivation and engagement to improve outcomes. These canine characteristics foster a positive therapeutic environment that lends itself well to the goals of therapy for this population.

Key words: canine therapy, dog therapy, occupational therapy, animal assisted intervention

Section 1: Literature Review

1. Introduction

Autism Spectrum Disorder (ASD) is a congenital neurodevelopmental diagnosis with no known cure (Grandin et. al., 2015). ASD has a prevalence of 1 in 68 and requires tailored interventions to address the complex presentation of symptoms unique to each individual (Tanner et. al., 2015). A range of interventions have been developed to benefit this community; however, many interventions have limited research demonstrating their effectiveness. Animal Assisted Therapy (AAT) using dogs is one such intervention for ASD that shows promise but has, to this point, lacked rigorous research. Contemporary research has made insufficient use of parent's perspectives regarding the impact and outcomes of AAT for their children with ASD. This represents a gap in the literature given parents are most often responsible for designing their child's intervention protocol and are thus in the best position to reflect on the value and challenges of this burgeoning intervention.

This literature review will address (a) ASD (b) parenting and ASD (c) current interventions for this population (d) Animals in Healthcare (e) AAT (e) the current role of AAT for ASD and (f) the gaps in the literature concerning the parent perspectives on the value of animal assisted therapy using dogs for ASD.

1.1 Aim of the literature review

The aim of this review is to synthesize and critique the existing literature addressing AAT with the use of dogs as an intervention for ASD and explore the parent perspective.

1.2 Database search method

A comprehensive database search was undertaken to source all literature relevant to this review. The following databases were searched: Medline, OTseeker, Cinahl, ScienceDirect, google scholar and University of Sydney library. Search terms included: Autism Spectrum Disorder, Autis*, parent*, famil*, animal assisted therap*, animal assisted intervention*, dog therapy, canine therapy, intervention*, experience*, understand*, explor*, animal therap*.

2. Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that can present difficulties with communication, social interaction, restrictive/repetitive behaviors, and regulation (American Psychiatric Association (APA), 2000); Grandin et. al., 2015). While the

term Autism was presented in 1911, it was first used in relation to this population in the 1940s in the United States by Leo Kanner (History of Autism/Project Autism, 2017). In 1987, Autistic Disorder was added to the *Diagnostic and Statistical Manual of Mental Disorders-Third Edition (DSM-III)* (History of Autism/Project Autism, 2017). The contemporary use of the term Autism Spectrum Disorder was introduced in 2013, when ASD was updated as an umbrella term that also includes pervasive developmental disorder, Asperger's disorder, and childhood disintegrative disorder (APA, 2000; Corcoran et. al., 2015). The term spectrum refers to the continuum of symptoms that can present, resulting in mild to severe dysfunction (Russell, 2016). There is a male bias of 4:1 in the diagnosis of ASD and onset is no later than three years of age (Berry et. al., 2013).

While the etiology of ASD is not known, it is believed that there are genetic and environmental factors that contribute to the disorder (Abrahams & Geschwind, 2008; Berry et. al., 2013; State, 2010). Studies confirm multiple genetic factors that, when combined with environmental factors, increase the probability of the disorder (Hallmayer et. al., 2011). Environmental factors can include maternal infection, premature birth, and advanced parental age, among others (Berry et. al., 2013). In Sweden, a population based study of over two million children born between 1982-2006 determined the risk of ASD was due equally to genetic and environmental causes (Sandin et. al., 2014). A systematic review has estimated that the worldwide prevalence of ASD is 2/1000 (Williams et. al., 2008), while 2014 the Center for Disease Control estimated the prevalence to be 1 in 68 (Center for Disease Control and Prevention, 2014). The Australian Bureau of Statistics estimates that 115,400 Australians live with ASD, while other reports have the number as high as 230,000 (Atladdottir et al., 2014; Australian Bureau of Statistics (ABS), 2013); Williams et al., 2008.) The prevalence of ASD in Australia is reflected in the fact that 31% of service recipients in the National Disability Insurance Scheme (NDIS) have a primary diagnosis of Autism ("National Disability Insurance Scheme", 2017).

This overarching diagnosis encompasses many different symptomatic presentations. These symptoms can complicate a child's ability to form relationships and can impact all sectors of their life including familial relationships, peer relationships, community access, academic performance, and job candidacy (Berry et. al., 2013; Ryan, 2010). Deficits in these areas can affect well-being and productive coping strategies such as goal oriented behavior and seeking social support (Samson et. al., 2015). Symptoms can make daily occupations very difficult for those diagnosed and their family and may lead to reduced social occupations and isolation (Burrows et. al., 2008; Fung & Leung, 2014; Ryan, 2010).

Once the diagnosis has been made it can result in an immense financial burden for the individual's families as well as the health care system. A 2006 study found that medical costs for children with ASD were more than three times higher when compared to their typically developed peers (Croen, 2006). Perhaps due to the complex nature of the diagnosis, many families are compelled to try a multitude of interventions that require resources (money, time) to develop an intervention battery suiting their child (Davis et al., 2015).

ASD is a diagnosis that impacts the entire family and “the assessment of interventions and lifestyle choices that effectively reduce carer stress is a critically important area for research in ASD treatment programmes” (Wright et. al., 2015, pg. 2531). In order to gauge the impact of a particular intervention, a contextual understanding of the lived experiences of the parents is paramount. Parents are primarily responsible for making health related decisions for their children. (Hoogsteen et. al., 2013). As a result, the experience of the parent must be considered when discussing available interventions for ASD. This will contribute professional understanding of the impact interventions have on the lived experience of the child and their families (Christon et. al., 2010; Corcorcan et. al., 2015).

3. Parenting with Autism Spectrum Disorder

3.1 Parenting and ASD: Positive parenting experience

Despite the challenges, parents report many positive experiences associated with raising a child with ASD. Parents can undergo positive changes to their perspective on disability, standards for success, and sense of community (Woodgate et. al., 2008). Parents report increased empathy and appreciation for the simple things in life that may go unnoticed in others (Corcoran et. al., 2015). While these positives are important to acknowledge, research reports increased levels of stress in this parent population.

3.2 Parenting and ASD: Stress

Stress is a phenomenon that impacts on a person's social, emotional, psychological, and physical health. Stress can be understood as a result of an imbalance between demands and resources (Hayes & Watson, 2013). Parenting typically involves periods of stress and uncertainty. However, research suggests that parents are adaptable and often capable of achieving a satisfactory quality of life by engendering a sense of stability, safety, and well-being (Hayes & Watson, 2013). The introduction of a chronic diagnosis of ASD to parents often complicates family identity and daily operations.

Family and caregiver stress is reportedly high for parents of children with ASD (Kuhaneck & Briner, 2010; Tanner 2015). Parenting a child with ASD can put a strain on family resources such as time, money, and attention to other children or significant others. While most parents experience parental stress, research asserts that parenting children with autism is associated with higher levels of stress, poor mental health, financial strain and social isolation than parents of typically developing children (Hayes & Watson, 2013; Wright et. al., 2015). This stress places parents at a increased risk for negative outcomes such as depression, anxiety, isolation and divorce (Brobst et al., 2009; Hayes & Watson, 2013; Rao & Beidel, 2009; Wright et. al., 2015). Studies show this impacts both the wellbeing of the parents as well as the potential efficacy of ASD treatment for their children (Osborne et. al, 2008). Using the Questionnaire on Resources and Stress (Friedrich et. al, 1983), along with intervention outcome measures, Osborne and Colleagues concluded that stress was an influential factor in intervention outcomes (Osborne et. al., 2008). Interventions targeting ASD must also consider the role of the parent and the impact the intervention is making on family functioning. Therapies that can both target ASD symptoms and alleviate parental stress have been insufficiently considered in the research to date.

3.3 Parenting and ASD: Balancing Multiple Roles

Parenting a child with ASD necessitates the adoption of many roles to achieve optimal outcomes for their child. Interventions for ASD often demand high repetition and intensity, requiring parents to act as therapists within the home (Munford et. al., 2001; Reed et. al., 2007). In addition to their typical roles, parents of children with ASD also must be advocates for increased awareness in the community, therapists, and experts in intervention. Parents report role confusion when seeking a balance between being a nurturing parent while implementing intensive therapies with their children (Hoogsteen et. al., 2013). Parents can be conflicted when they feel they must sacrifice family time and relaxation to satisfy the rigor of interventions they feel may help their child in the long term (Brandon, 2007; MacDonald & Callery, 2007). Additionally, enacting therapy in the home can complicate the physical space of the home, transforming it into a clinic with rotating professionals that can make families feel there is limited reprieve from the demands of therapy (MacDonald & Callery, 2007). Despite the immense amount of effort and time many parents must commit, many reported it was their greatest achievement to contribute to the success of their child (Hoogsteen et. al., 2013).

3.4 Parenting and ASD: Stigma

Lack of community acceptance or empathy is a source of strain for families whose children have autism (Kinnear et. al., 2015). In addition to the difficulties of managing ASD symptoms parents also face public judgement that can come in the form of verbal or nonverbal reproach (stares, looks of disgust or irritation). Parents report feelings of isolation due to a lack of understanding in their community (Kinnear et. al., 2015; Woodgate et. al., 2008). The experience of stigma makes community access and engagement problematic for parents who already face barriers due to the symptoms of ASD that complicate social interaction, family routine. Parents report “part of the reason they were judged so harshly was that autism is ‘invisible’ in that the child does not look disabled; therefore, people have a hard time believing that the negative behaviors are due to a disorder” (Corcoran et. al., pg. 361). This can result in negative interactions with the public that compound the social obstacles faced by children with autism and their families.

3.5 Parenting and ASD: Service provision

Engagement with services is an area in which parents regularly report frustration and exhaustion (Carbone et. al., 2010). Parents can feel overwhelmed with numerous interventions with no uniform process to access them (Ewart, 2002). When appraising interventions, parents must combine their expertise on their child’s ASD with the available information on the given intervention. Their unique understanding of their child makes them most suitable to make this decision, however, the burden of navigating this process can often result in “considerable worry, financial hardship, difficulty locating specialty programs, and dissatisfaction with service provision” (Russell et. al., pg. 22). Currently, parents are exposed to a saturated market of interventions and it can be difficult to determine their efficacy due to the insufficient levels of evidence available (Goin-Kochel et. al., 2006).

4. Interventions for ASD

“‘When there is no cure, there are 1000 treatments.’ –Donald Cohen” (Goin-Kochel et. al., 2009, pg. 195)

Given the impact ASD has on social participation, interventions often seek to target social engagement and positive coping mechanisms to manage symptoms (Tanner et. al., 2015). However, ASD does not have a consistent presentation. An infinite variation of symptom

severity exists within this population. As a result, parents engage a multitude of interventions that may or may not be appropriate for their child. Therapies for this population focus on communication, relationship building, social reciprocity, sensory integration, regulating behavioral challenges, and addressing fixed/restricted interests (Tanner et. al., 2015). This is often done in conjunction with pharmacologic interventions using anti-depressants, stimulants, neuroleptics and antipsychotic medication (Witwer & Lecavalier, 2005). These pharmacological interventions do not address the symptoms of ASD themselves, but rather but rather the psychiatric components of the diagnosis such as hyperactivity or aggression (Berry et. al., 2013; Rogers & Vismara, 2008). Often, pharmacological interventions are intended to prime children with autism for therapy by moderating their level of arousal.

ASD can be a challenging disorder to treat. However, research has shown “interventions carried out during early childhood have been shown to decrease symptom severity.” (Berry et. al., 2013, pg. 73). Early intervention is a battery of therapies that often include speech pathology, physical therapy, occupational therapy, and applied behavioral analysis. Typical targets within these specialties include:

(a) functional spontaneous communication; (b) social instruction in various settings throughout the day; (c) play skills with a focus on play with peers and peer interaction; (d) new skill acquisition and generalization and maintenance in natural contexts; (e) functional assessment and positive behavior support to address problem behaviors; and (f) functional academic skills when appropriate. (National Research Council, 2001, pg. 17)

In a study of 479 children, researchers found that families had tried an average of seven to nine different therapies for their children, and typically used four to six concurrently (Goin-Kochel et. al., 2006). Many of these therapies have limited evidence supporting their effectiveness (Goin-Kochel et. al, 2006; Rogers & Vismara, 2008; Tanner et. al, 2015). Interventions that engage behavior based strategies appear to most effectively improve deficits associated with ASD (Vismara & Rogers, 2010).

Due to the reported relationship between parent stress and reduced efficacy of interventions it is important for researchers to consider the impact interventions have on the whole family (Osborne et. al, 2008; Wright et. al., 2015). People with ASD and their families require interventions that can be adaptable to their specific presentation and be appropriate across a lifespan (Russell et. al., 2015). Such interventions are rare and it remains a challenge for researchers to verify their universal applicability due to the nebulous nature of the diagnosis and its presentation.

5. Animals in Health Care

This review will focus on dogs as agents within Animal Assisted Therapy. Within subsequent references to AAT it can be assumed that dogs were the animal participant in the therapy unless specified otherwise.

Animals, and in particular dogs, have been recognized for their therapeutic potential for many years. Health benefits associated with the human/animal bond is referenced in innumerable ancient and indigenous societies around the world. Indeed, ancient Greek god of medicine Asclepius, whose serpent entwined staff is still used as the symbol for medicine today, was said to have used dogs as healers in his temple (Serpell, 2010). Animal assistance is well established in the domains of visual impairment and community safety (specialized bomb sniffing, search and rescue, and police dogs). Service animals are used within hospitals to support the emotional well-being of patients. While conventional wisdom has noted the benefits of animal interactions, research investigating the true health impact animals can have on mental and physical ailments has been limited. Animal Assisted Therapy (AAT) is a unique domain of animal assistance that has benefited from research, and a meta-analysis has shown positive results (Nimer & Lundahl, 2007).

5.1 Animal Assisted Therapy

Animal Assisted Therapy is characterized by a professional therapist incorporating an animal in an intervention to achieve preset goals (Friedmann et. al., 2015). AAT, under its current definition, officially began in 1919 in a psychiatric facility in Washington D.C. when St. Elizabeth's Hospital incorporated dogs into the therapeutic battery for patients (Chandler, 2011). Boris Levinson is considered the first to utilize AAT for the pediatric population in his psychology practice in the United States during the 1960s (Chandler, 2011). While AAT can involve different animals, dogs in particular have been employed with the most regularity (Fung & Leung, 2014; Nimer & Lundahl, 2007; Prothmann et. al., 2009). AAT can be applied to multiple diagnoses, ages, and practice contexts (Berry et. al., 2013; Nimer & Lundahl, 2007). A systematic review of the quantitative data found that overall "AAT was associated with moderate effect sizes in improving outcomes in four areas: Autism-spectrum symptoms, medical difficulties, behavioral problems, and emotional well-being" (Nimer & Lundahl, 2007, pg. 225). The individual benefits from the therapeutic qualities of the animal that encourage communication, social interaction, rapport building, and sensory integration (Grandin et. al., 2015).

6. Animal Assisted Therapy for ASD

AAT is a relatively young intervention for the ASD population. Redefer & Goodman (1989) are considered the research pioneers in AAT for ASD. Subsequent to their study, AAT using dogs has been increasingly employed as a tool with which the therapist can guide goal directed activities (Burrows et. al., 2008; Davis et. al., 2015).

6.1 Why Dogs?

Dogs are an indicator species and have the capability to read and understand human emotions (Morey, 2010). Indicator species are sensitive to their environment and can act as a warning system for danger or threats to environmental equilibrium. Dogs have developed behavioral synchronization with humans due to their extended cohabitation with humans (32,000 years) (Morey, 2010). In that time, dogs have undergone an evolutionary process that caters to communication with humans as a means of survival. A canine's ability to lend itself well to therapeutic outcomes is not merely chance; "dogs' social skill in cooperative-communication contexts are a case of convergent evolution with humans" (Hare, pg. 61). Their specialized relationship to humans is physiological, neurological, and behavioral (Hare & Tomasello, 2005; Morey, 2010). This makes them particularly well suited to therapeutic goals that focus on communication and regulation.

6.2 The Impact of Dogs on Communication and Social Interaction

AAT that utilizes dogs shows potential for allaying the symptoms of ASD that compromise communication and social interaction (Davis et. al., 2015; Fung & Leung, 2014; Prothmann et. al., 2009). Dogs provide readable nonverbal cues. This accessible form of communication can facilitate social interaction for children whose ASD makes interpreting verbal communication difficult (Grandin et. al, 2015). Dogs do not place demands or expectations on client's communication that can compromise a client's ability to develop their skills. By removing language use as the primary medium for communication, dogs facilitate simple but effective communication and genuine engagement (Grandin et. al., 2015). Dogs can serve as catalysts for more spontaneous, intrinsically motivated communication that can be graded and applied to interpersonal communication (Martin & Farnum, 2002; Fung & Leung, 2014).

Redefer & Goodman (1989) found that AAT resulted in an increase in social interaction and use of verbal and nonverbal, communication with the dog and therapist. Improvement was maintained during a one month follow-up period (Redefer & Goodman, 1989). While this study lacked clear eligibility criteria and did not include a control group for comparison,

subsequent studies have reported similar results. One such study reported that in “therapeutic settings with dogs, individuals with ASD talk more to the therapist, and are quicker to build a friendly rapport” (Grandin et. al., 2015, pg. 228). This increase in communication has been noted in interactions with persons known (parents, siblings) and unknown to the child. One study reported in some cases this increase in communication as novel behavior that had not previously been exhibited prior to the introduction of the dog (Solomon, 2010). These studies demonstrate that dogs may provide opportunities for children with ASD to interpret, internalize, and respond to gradable communication guided by the expertise of the therapist present.

A study exploring the theory of biocentrism for participants with ASD yielded positive results in relation to communication (Sams et. al., 2006). Biocentrism contends humans are inherently drawn to the living things around them. Interaction with nonhuman species, such as dogs, can act as an intrinsic motivator. Intrinsic motivation has long been held as an advantageous component of effective therapy regardless of the intervention (Sams et. al., 2006). This study’s use of AAT included dogs, llamas and rabbits. Participants were provided one session per week of occupational therapy without AAT and one separate session of occupational therapy with an animal for 15 weeks. This pilot study found that the children “demonstrated significantly greater use of language and significantly greater social interaction in sessions incorporating animals when compared to sessions using exclusively standard occupational therapy techniques” (Sams et. al., 2006, pg. 268). Berry and colleagues found dog’s simple, repetitive, predictable non-verbal interactions lend themselves to intensive practice of communication goals (Berry et. al., 2013).

A systematic review of literature on animal assisted intervention (AAI), an umbrella term under which AAT sits, found that social interaction was improved in nine of the fourteen studies, while five reported increased language use (O’Haire, 2013). Of those studies five were AAT with dogs. Though these results are promising, the same systematic review tempered their findings by stating there was “preliminary support for the concept if AAI...through increased social interaction and communication as well as reduced problem behaviors, autistic severity, and stress. However, further, more rigorous research will be necessary “(O’Haire, et. al., 2013, pg. 1619). More must be done to understand the phenomenon to amplify the potential of this intervention.

6.3 The Impact of Dogs on Regulation

A study exploring the emotional regulation found that people with ASD experience more anxiety and anger than their typically developing counterparts with increased use of maladaptive regulation strategies (violence, self-harm, repetitive behavior) (Samson et. al., 2015). As such, people with ASD could benefit from interventions that target positive regulation strategies. Redeker & Goodman (1989) “found that children with autism demonstrated fewer stereotyped behaviors such as hand-posturing and humming, and increased socially appropriate behavior such as joining the therapist in simple games, when a friendly therapy dog was introduced into the sessions” (as cited by Sams et. al., pg. 270). This finding was also demonstrated in a study that reported reduced maladaptive behaviors, increased incidents of affection, and signifiers of enjoyment such as smiling during the AAT sessions (Silva et. al., 2011). For clients who experience escalations in behavior, dogs have been found to provide a calming influence (Berry et. al., 2013).

A study conducted in 2002 compared behaviors in children with ASD when interacting with a ball, a toy dog, and a live dog (Martin & Farnum, 2002). The authors reported increased interaction, awareness, and engagement when the dog was present. However, they also reported increased stimming and repetitive behaviors reflective of a high state of arousal (Martin & Farnum, 2002; Stevenson et. al., 2015). While dogs can support play and enjoyment they can also elicit fear, excitement, or sensory overload that can induce maladaptive coping mechanisms such as repetitive behavior. It is important to employ trained service dogs to prevent behaviors that people with ASD may find distressing such as jumping, licking, or biting (Funahashi et. al. 2013). Dogs have varying states of arousal and personalities, not unlike humans. Close attention must be paid to the traits of both the client and the dog when designing an intervention to ensure they are complimentary. However, this increased arousal state may benefit clients who are low affect or difficult to engage. Dogs provide a dynamic multisensory experience and have the potential to improve the arousal state of high threshold sensory clients (Berry et. al., 2013; Redeker & Goodman, 1989).

While research in AAT using dogs has shown promising results for clients with ASD, a review of the evidence base reveals a lack of standardization, transparency, large samples or randomized control trials (Berry et. al., 2013; O’Haire, 2013). Systematic reviews and meta-analysis also suggest lack of rigor in eligibility criteria, methodological weaknesses (poor internal and construct validity), and lack of control groups compromise the strength of the results (Davis et. al., 2015; Nimer & Lundahl, 2007). AAT is in nascent stages as an

intervention and would benefit from further rigorous research to better understand the mechanisms of this intervention. While the research shows improvement in communication, social engagement, intrinsic motivation, and regulation, more must be done to gain insight into the implementation and outcomes of AAT for people with ASD. Further research on the benefits of this therapy would allow therapists to maximize the potential of the intervention to the benefit of clients and families.

7. Parent Perspectives on Animal Assisted Therapy for ASD

No studies or publications investigating parent perspectives of AAT using a dog were identified from the searches conducted for this literature review. This represents a gap in the literature. Parent perspectives will play an important role in filling that research gap. Current research on parent perspectives considers assistance dogs who have been placed within the family home, rather than dogs who work in a clinic setting under the direction of therapists. This is an important distinction because AAT is characterized by a therapist guided intervention.

Burgoyne and colleagues (2014) used questionnaires to seek parental experiences of having an assistance dog in the home. Parents felt the benefits of an assistance dog (safety, companionship, community engagement) outweighed any constraints (training, exercising) (Burgoyne et. al., 2014). Another study explored the use of complementary and alternative medicine (CAM) including AAT for children with ASD (Christon et.al., 2010). Surveys were used to determine what CAM therapies parents chose for their child and the perceived efficacy of those therapies. It was not clear whether the animal therapy took place in the home or in the community. The authors found 62.7 percent of parents who tried animal therapy reported a perceived improvement (Christon et.al., 2010).

When research is lacking, parents rely on word of mouth and internet search to make health decisions for their children. They value parent opinions concerning efficacy. The healthcare community needs to provide safe and verified interventions for this. Given the diversity of available therapies, quality research should be available to parents so they can make the most informed treatment decisions for their child (Christon et.al., 2010; Sivberg, 2002). Clearly, more research must be done to understand AAT for the ASD population.

As allied health professionals begin to increase their use of dogs and AAT in practice, it is critical to engage key informants to understand the comprehensive impacts of the therapy. Parents are the constant caregivers for their children and are in a unique position to provide

expert opinion on their child. They can observe and report on the effects within the therapy and at home. Parents are well suited to reflect on strengths and weaknesses of a protocol due to the high exposure they have to therapy. Parents are sensitive to progress. An interaction that may appear insignificant to others may in fact be a breakthrough. Even with a professional lens, therapists may miss cues that parents are attuned to given their intimate knowledge of their child's behavior. Parents play a significant role in providing professionals the necessary information to accommodate their child's needs and appreciate the goal directed gains. Parents are a rich resource that should be utilized when seeking to understand the role AAT can play in the intervention portfolio available to children with ASD.

8. Conclusion

This review of the literature has found support for AAT for children shows net positive results for symptom reduction (Berry et. al., 2013; Christon et. al., 2010; O'Haire, 2013). Particularly, AAT appears to benefit communication, interaction, regulation, and community access. However, to date, the research has been plagued by inconsistent or poor methodology or weak evidence. Research has been conducted primarily in the realm of assistance dogs and there is a dearth of research on AAT specifically. Redefer and Goodman's work was conducted in 1989 remains a highly referenced study in the literature due, in part, to the lack of subsequent studies on this intervention. Relying on research that is approaching thirty years old is not optimal for any health care intervention. While there have been a handful of studies since 1989, AAT remains understudied and more must be done to gain a contemporary understanding of this intervention.

Further, this reviewed revealed a gap in the literature regarding parent perspectives on community based AAT for children and adolescents with ASD. Gaining insight from key informants is a critical component of understanding the potential of this innovate treatment. The parent perspective is needed to grasp the intricacies of how AAT works for individual children and what symptoms it targets most effectively. Parents can provide a true appraisal of what has been achieved in the AAT sessions, thus providing insight into the potential of AAT for the ASD population moving forward.

9. Proposed Research

The proposed research will engage parents whose children have participated in five community based occupational therapy sessions using AAT. At the conclusion of the five

sessions a phenomenological qualitative approach will be used to engage parents as key informants using in-depth interview. The purpose of this research is to explore the strengths and weaknesses of this therapy from their perspective. The questions to be explored are:

- What are the parent's perspectives on the implementation of AAT for their children with ASD?
- What do they feel are the strengths and weaknesses of the intervention?
- What symptoms does this intervention target most effectively?
- Do parents feel this is an impactful therapy for their children?

This study will contribute to the existing professional understanding of AAT and its application to this community. Using key informants to explore this therapy will expand body of knowledge therapists can employ to enhance their practice and guide the future of this pioneering field.

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Section 2: Journal Manuscript

Animal Assisted Therapy for Children and Adolescents with Autism Spectrum Disorder: Parent Perspectives

Maeve Doyle Condon, Dr. Lynette Mackenzie, Dr. Meryl Lovarini, Claire Dickson, Alberto Alvarez-Campos

Maeve Condon: 55 Ferndale St., Newtown, NSW, 2042

Dr. Lynette Mackenzie: The University of Sydney, NSW 2006

Dr. Meryl Lovarini: The University of Sydney, NSW 2006

Claire Dickson: Shop 3/39-41 Railway Parade, Engadine NSW 2233

Alberto Alvarez-Campos: Shop 3/39-41 Railway Parade, Engadine NSW 2233

Contact information: maevedoylec@gmail.com, 1-401-239-4884

Abstract

Animal Assisted Therapy for Children and Adolescents with Autism Spectrum Disorder: Parent Perspectives

Background/aim: Animal Assisted Therapy (AAT) is a promising intervention for Autism Spectrum Disorder (ASD), but requires further research. This study aims to explore the parent perspective of the therapeutic impact of five AAT sessions on their children with ASD.

Method: A phenomenological qualitative approach was used to access first-hand parent perspectives. In-depth, semi-structured interviews were conducted and a thematic analysis was consensus coded using NVIVO.

Findings: Seventeen parents participated in the study. Participants reported the presence of the dogs engendered engagement, enjoyment, and motivation within their children. This reportedly contributed to gains in communication, regulation, and community access.

Conclusion: Findings indicate that parents support the use of AAT for children with ASD. Dogs as nonverbal and nonjudgmental therapy partners facilitated therapeutic gains.

Key words: canine therapy, dog therapy, occupational therapy, animal assisted intervention, caregiver.

Animal Assisted Therapy (AAT) is characterized by a professional therapist incorporating an animal in an intervention to achieve predetermined goals (Friedmann et. al., 2015). The individual benefits from the therapeutic qualities of the animal as intuitive, nonjudgmental, non-verbal communicators (Grandin et. al., 2015). A review of the literature found preliminary support for AAT for children with Autism Spectrum Disorder (ASD) and positive outcomes in symptom reduction (Berry et. al., 2013; Christon et. al., 2010; O’Haire, 2013).

Autism Spectrum Disorder (ASD) is a neurodevelopmental congenital diagnosis with no known cure (Grandin et. al., 2015). ASD is an umbrella diagnosis that also includes pervasive developmental disorder, Asperger Syndrome, and childhood disintegrative disorder (American Psychiatric Association (APA), 2000; Corcoran et. al., 2015). The term spectrum refers to the continuum of symptoms that can present and result in mild to severe dysfunction (Russell, 2016). ASD can present difficulties with communication, social interaction, restrictive/repetitive behaviors, and regulation (APA, 2000); Grandin et. al., 2015). These symptoms can complicate a child’s ability to form relationships and can impact all sectors of their life including familial and peer relationships, community access, academic performance, and job candidacy (Berry et. al., 2013; Ryan, 2010). There is a male bias of 4:1 in the diagnosis of ASD and onset is no later than three years of age (Berry et. al., 2013). While the etiology of ASD is not known, it is believed that genetic and environmental factors contribute to development of the disorder (Sandin et. al., 2014).

ASD has a prevalence of 1 in 68 and requires tailored interventions to address complex symptom presentations (Tanner et. al., 2015). AAT using dogs is one such intervention for ASD that shows promise in addressing communication, social engagement, maladaptive behavior, and fixed/restricted interests (Tanner et. al., 2015). However, systematic reviews advise inconsistent methodology or weak evidence has compromised the strength of the

findings and more must be done to determine the mechanisms of this therapy (Berry et. al., 2013; O’Haire, 2013).

The author found no studies investigating parent perspectives of AAT using dogs. As allied health professionals continue their use of dogs and AAT in practice, it is critical to engage key informants to understand the impacts of the therapy for this population. Parents are the constant caregivers for their children and are in a unique position to provide expert opinion on their child’s experience of interventions (Burgoyne et. al., 2014). They can observe and report on the effects within the therapy and at home. A study exploring treatments for ASD found that parents had tried an average of seven to nine therapies for their children (N=479) (Gion-Kochel et. al., 2006). Parents are well suited to reflect on strengths and weaknesses of a protocol due to their high exposure to therapies. This study explores the perspectives of parents whose children participated in five one-on-one occupational therapy sessions with an assistance dog. These sessions were provided by Assistance Dogs Australia in Sydney, Australia. Each session included an occupational therapist, an assistance dog, and an assistance dog trainer. The aim of this study is to explore the therapeutic potential of Animal Assisted Therapy for ASD from the perspective of the parents, and in doing so, gain a better understanding of which symptoms AAT targets most effectively.

Methods

Methodology

A phenomenological approach was taken to explore the parent perspectives. Phenomenology explores how a group interprets their particular experiences (Stenfors-Hayes et. al., 2013; Tai & Ajjawi, 2016). This qualitative approach best supports the aim of gaining first-hand insight into the parent perceptions, feelings, and observations of the AAT sessions and the therapeutic outcomes for their children. Qualitative phenomenological study provides the best approach for exploring experiences that are not yet known or understood (Doody and Bailey,

2016).

Recruitment

Purposive recruitment was used in conjunction with intensity sampling to engage parents whose children had participated in the animal assisted occupational therapy sessions. Intensity sampling explores the lived experience of participants using comprehensive techniques (Patton, 2009). This sampling technique allowed researchers to attain in-depth information about the experience of participants. The occupational therapist conducting the therapy provided parents with an information statement detailing the research parameters and a consent form was provided to parents at the onset of the therapy sessions. It was explicitly stated that participation in the parent interview was voluntary, and they could withdraw at any time with no adverse effect. After written consent was obtained, parents were contacted by the researcher and invited to be interviewed at the conclusion of the five occupational therapy sessions.

Inclusion criteria: Parents who lived in the home with the child and had been present at a minimum of three sessions. This was to ensure that they had an opportunity to observe the therapy and speak to its effects both within and outside the sessions.

Sample Size

Interviews were conducted until saturation was reached. Seventeen participants were sufficient to develop themes that remained consistent across the interviews. A sample of this size allowed for sufficient time for in-depth analysis. Recruitment was discontinued when saturation was reached and the interviews no longer produced unique data indicated by consistent data replication (Bowen, 2008).

Instruments

A semi-structured interview (found in Appendix C) designed specifically for this population was used to collect data following ethics approval through University of Sydney Research Integrity & Ethics Administration, approval number 2016/984. This instrument provided the necessary flexibility for comprehensive exploration of participant experience, while still allowing the interview to be guided by relevant questions (Minichiello et. al., 2004). The interview consisted of approximately twenty open ended questions designed to gain information on parent's thoughts, feelings, opinions, and perspectives on Animal Assisted Therapy for their children with Autism Spectrum Disorder (DiCicco-Bloom & Crabtree, 2006; Tai and Ajjawi, 2016). The interview was piloted on three parents with knowledge of AAT to ensure validity.

Participants were given a choice between in-person interviews or a phone interview to reduce participant burden. All but two participants opted for phone interviews. Two participants completed the interview in a survey style due to extenuating circumstances. After obtaining verbal consent, interviews lasting between 30-80 minutes were audio recorded.

Analysis

This research followed a recognized, rigorous process for analyzing developed by Braun & Clarke (2006). The analysis occurred in phases to ensure comprehensive appraisal.

Phase 1. Interviews were de-identified and transcribed verbatim by a professional service. Interviews were then consensus coded by three members of the research team until themes remained consistent. Themes were developed through a process of identifying meaningful phrases that were then analyzed by the three coders (Moustakis, 1994). The primary purpose of the analysis was to look in depth at each individual's experience and find commonalities

between them that could be developed into themes. The themes developed were consistent among the coders.

Phase 2. The research team discussed the codes and developed an embryonic code book that served as the basis for the thematic analysis for the entire data set. The data set was then uploaded into NVIVO, where it was analyzed for the remainder of the study.

Phase 3. The data underwent a thematic analysis using the consensus code book as isolation of quotes and key themes developed further. Transcripts were line by line coded in relation to the code book. Key themes evolved and underwent a process of consolidation under major themes and subthemes based on relationships found between the data. The Data set was consistently rechecked and interviews were reread to ensure fidelity. Themes and subthemes were endorsed by the second and third author throughout the analysis.

Phase 4. The team created final consensus around the findings. A results tree was generated based on the major themes and subthemes that emerged through analysis. One overarching theme and three subthemes emerged from analysis.

Study findings are a result of the researcher's interpretation of the data. Due to the subjective nature of qualitative analysis, the first author bracketed assumptions and reflected on potential bias and influence through use of a field diary for the duration of the study (Braun & Clarke, 2006). The purpose of this research was to take an in-depth look at a particular experience, and thus may not be generalizable (Tai & Ajjawi, 2016).

Results

A total of seventeen parents participated in this study. The demographic characteristics of the sample are presented in Table 1. Pseudonyms are used to ensure participant confidentiality.

[insert table 1 here]

The reported symptoms experienced by participant's children are reported in Table 2. Other diagnoses mentioned were ADHD, depression, anxiety, epilepsy, intellectual disability, and muscular dystrophy. This information is reliant on parent report and may not be exhaustive.

[insert table 2 here]

The therapies participants reported that their child had exposure to are presented in Table 3.

This table is reliant on parent report and may not be exhaustive. Two parents had received an assistance dog after completion of the program and two were involved in assistance dog puppy training.

[insert table 3 here]

The activities reportedly completed within the therapy were the following:

- Writing session schedule
- Brushing
- Walking the assistance dog in the community
- Peeling and cutting vegetables
- Feeding assistance dog
- Fetch
- Direct interaction with assistance dog
- Tug of war
- Painting
- Dog trick training
- Animal hospital
- Making an obstacle course

Parent perspectives of occupational therapy sessions using assistance dogs (Animal Assisted Therapy) were characterized by the overarching theme of *Engagement as a precursor to progress*. This overarching theme was supported by 3 subthemes: canine characteristics; the

therapeutic context; and, goal directed achievements. Figure 1 illustrates the relational flow from the dog's innate characteristics, to the contributions they made to the therapeutic environment, and finally the goal specific gains reported.

[Insert Figure 1 here]

Theme 1: Canine Characteristics

Participants reported that the innate characteristics of the dog presented opportunities for therapeutic gains that cannot be replicated by humans.

Non-judgmental co-participant

Parents recounted that the dog supported their child by removing the stress and pressure that often exists in interpersonal relationships. Rochelle explained,

“the dog just accepts you, whereas a person is not so accepting. I think that was the main thing that helped him.”

As nonjudgmental therapy partners, dogs removed expectation or performance-based appraisal. Michelle reflected that her daughter

“has difficulty relating to people, and I think because the dog wasn't expecting anything from her, you know, when she walked in, there was no one saying how do you feel? Can you do this? That's probably a big part of it.”

Parents reported that this lack of judgment allowed their children freedom to be themselves because of the dog's willingness to meet them at their level of function.

Non-verbal communicator

Participants suggested that the dog's nonverbal communication was more accessible for their children. Tessa verbalized:

“a dog wouldn't expect him to talk, but there might be some sort of physical body language that he might get to understand a little bit more. I suppose it's a little bit less threatening than trying to interact with a person.”

Pru echoed this, stating “[there are] *benefits to having [her son] interact with a dog that cannot be done just with human interaction.*” The dog reportedly helped their children comfortably practice their communication skills. For some, this transferred to their understanding of interpersonal communication. Gabriela stated:

“He has to communicate with someone who's nonverbal and he's thinking about what their communicating for that hour that he's there. I think he walked away not noticing that he was noticing that in people afterwards.”

The dog’s nonverbal communication also prompted the child to use verbal communication ask questions about the dog. Raquel explained:

“I think Kookie [the dog] really gave him a push...so he was more inclined to introduce himself and ask them questions about why Kookie was doing this, and why did he do that. “Where does he sleep? Does he live here?” It opened up the conversation with him.”

While there were many positives, participants also related difficulties associated with the innate characteristics of the dogs. Tessa felt the smell of the dog was difficult for her child to tolerate. Raquel related her son became nervous at “*the size of Kookie and his claws and the teeth and because, you know, everything is bigger on a big dog.*” These challenges had to be overcome to engage in the therapy. While it varied, parents universally reported decreased reticence around the dog.

Theme 2: The therapeutic context of including assistance dogs

Facilitating engagement and interaction

All seventeen participants used a variant of the term engagement when describing their child’s response to working with assistance dogs. For many, engagement was often difficult to achieve. Noemie remarked, “*afterwards I said to [the therapist] ‘that wasn’t him! He was*

so engaged the whole time.’” Some reported gains that may objectively appear small were in fact significant. Katarina said:

“It was huge. The fact that he actually went and stayed in the room and didn't try and run out and stayed for the whole time is so huge because he has not done that in the past. That's a big achievement.”

Creighton concluded, *“The dog was a critical part of [therapy], he was engaged in that.”*

When asked to consider what role they felt the dog had in their child’s level of engagement, many felt the dog was the primary factor.

Facilitating therapeutic play and enjoyment

Parents consistently noted their child’s level of enjoyment during the sessions. While goal achievement was important, many parents were first and foremost *“just happy that he enjoyed himself”* (Calpurnia). Anne recalled: *“It was like the dog being there brought out this amazing joy and happiness within him.”* Play based therapy was viewed as an asset. Many parents felt enjoyment was missing from other therapeutic environments and was a rare benefit of working with dogs. Nell said the dog *“makes it more playful for them and keeps them on their toes... and not just want to play on their own or do what the therapist is asking them to do constantly.”* Noemie concurred:

“We have issues like the transition going into music can be difficult. Or when our OT and speech come to our house, they'll walk in and he'll run and hide. The dog therapy, he didn't have that at all. He was excited to go every time.”

Parents reported sessions could be tailored to their child’s interests and drew a relationship between enjoyment and therapeutic outcomes. Emmett reported:

“if he perceives something as being work he resists it...the dog makes it more fun for him and less work-like, not as dry. I think you can get more out of him by working with a dog like that, rather than just being an adult's in the room with him asking him to do stuff.”

Parents also noted a relationship between enjoyment and increased confidence in their child as the therapy progressed.

Facilitating comfort and confidence

Many participants perceived an increase in confidence in their children as the therapy sessions evolved. Malcolm noted an improvement in his son's "*comfort level and general confidence.*" In relation to communication, Raquel said she "*couldn't believe his confidence levels after we started. They were amazing...it was certainly not one of the outcomes we were expecting, but yeah, it was a very, very beneficial one.*" Some noted that confidence translated to increased self-direction to take ownership over their therapy process. Michelle recalled:

"By the end of it I remember she walked in and sort of without even being told, she just started asking the dog to do some tricks...Just sort of more confident and also with talking to [the therapist], I noticed she was conversing better."

That intrinsic motivation to engage in therapy was an integral benefit in the eyes of many participants.

Facilitating motivation

Parents reported that the dog provided motivation to complete goal directed tasks throughout the session. Raquel said:

"I'm not saying that he wouldn't have done [activities] in a normal [session] but he would have whinged and carried on for 10 minutes before he would have done it, and it would have been a very half-hearted effort put into it. Whereas because he was doing it for Kookie it was automatic."

Others felt the dog motivated the child to stay in therapy, viewed as a critical step to participation that could be difficult to achieve. Katarina asserted:

"If the dog wasn't there he definitely wouldn't have stayed. The dog was the motivating factor to stay. I can tell you now without a doubt if there was no dog there he would be out that door within five minutes. That was a motivator to stay."

Many found this intrinsic motivation was a critical component for gains in goal achievement, particularly in non-preferred activities such as fine motor and overcoming sensory defensiveness. While parents reported fluctuations and resistance to non-preferred activities, they predominantly reported levels of engagement and motivation they considered significantly higher in relation to other therapies.

Theme 3: Goal directed achievements

“It's just amazing to see him so happy and engaging with people he's never met before in a space that he's never been to before and being so confident...It was awesome and just was building on everything we've been working towards the last three years.” (Noemie)

Communication

Parents reported it was easier for their child to communicate with the therapist because of the dog's presence. Rochelle said her son *“was able to build rapport with [the therapist], [the dog] helped in that respect.”* Parents reported that teaching the dog tricks gave their child a manageable amount of verbal communication to master and was supported by the dog's immediate response. The program also reinforced specific components of communication such as eye contact. Gabriela reported:

“He got better at thinking about if I say something it will result in an action...it was easier just to pull it back to, ‘Well, if you tell a dog to sit, what does it do’ ... my son would control his voice when he was giving commands to the dogs and he would be patient and he would learn how to give the command to the dog in a way that he just usually wouldn't.... Volume, pitch, tone; it's stuff that we've spoken about at home as well, but watching him use his calm voice and get really excited and flappy and then calm himself down for a second so that he could communicate with the dog. It's like, ‘So you can do that!’”

Some parents praised the dog's ability to promote community interaction. For instance, when Michelle described her daughter taking the dog to the store:

“at the checkout they let her go through and the man at the checkout was talking to her about the dog. And she doesn't usually answer, but we sort of prompted her to listen and she actually answered him. It's good for interaction.”

The dog reportedly created opportunities for inter-species and interpersonal communication and interaction through reciprocation, reinforcement, and in some cases simply by their physical presence.

Regulation

Many parents reported their child had difficulty with regulation that could lead to “*meltdowns*,” violence, avoidance, and isolation. Parents conveyed gains in this area following AAT sessions. Emmett felt the dog's ability to mirror arousal states provided a useful visual for his son in understanding the external impact of his own level of arousal.

Rochelle stated:

“I find that when he came home from them he was a lot calmer and it didn't last the entire week but it lasted a couple hours. You could see that there was benefit. One of the days he had a really bad day when he'd been suspended from school. He got [to the session] and he would calm down every time. You could see a big change in him ... Just to be able sit down and have cuddles [with the dog] was really good to him...he won't let us do that to him. We're not allowed to give him the cuddles and the physical stuff, but the dog could.”

Michelle related:

“Most of the time [my daughter] is very hyperactive, you know she paces and stims and all those things, so to see her actually relax like that was quite amazing.”

Being in the optimal state of regulation supported their child in expanding their skill set and trying to things in a safe and pro-adaptive way.

Trying New Things/Expanding Interests

Several parents noted the therapy influenced their child's willingness to try new things. Anne said *"it felt like the therapy with the dog did completely different things; things that I haven't seen in other therapies....It just kind of brought out another level."* Others noted their child had an increased willingness to complete non-preferred activities, or introduced new activities into their daily life as a result of the therapy. Jane stated her son *"visits the park with his grandad and there are dogs. [My son] took the lead and walked their dog through the park on his own accord. This he has learnt and taken an interest in from the program."* Emmett's son had a fear of dogs from childhood, however:

"He's certainly a lot less fearful of dogs now, so much so that we've got ourselves a puppy now...He can stroke the puppy and this sort of stuff. That's something he wouldn't have been able to do before those sessions. He probably wouldn't have even come into the same room as it."

Tessa noted that her son was tactile defensive, however:

"he would hold out a carrot to the dog, and pet the dog with some support... I was actually quite happy that he was able to achieve that after five sessions because there are things like slime or like shaving cream or even like play dough that it's taken him maybe a whole year at preschool to want to touch."

For many, this willingness to try new things was noteworthy due to their child's fixed interests and behaviors.

Community Access

"If you want to boil it down to one sentence [the dog] opens door for [my son] that would be closed otherwise." (Malcolm)

Community access was a topic most parents raised when discussing the difficulties associated with ASD. Particularly, maladaptive behaviors due to dysregulation and routine oriented constraints. Anne noted that *"meltdowns quite often happen when we're in public."* Many

reflected on the lack of community empathy because people with ASD often do not have visual markers of disability. Noel contended the dog helped both with a reduction in maladaptive behaviors as well as increased awareness from the community:

I take him for a walk now he will stop every couple of metres and either hit the fence...hit the floor...He didn't do any of that with the assistance dog. He held onto the leash and he just continued to walk. Maybe once he stopped and did it. I thought, 'Oh wow. I can get somewhere with him.'

The best thing was going out into the public, and how easy it was because it's not easy for me. That sounds really awful but it's the public perception because nobody knows what's wrong with him...If he's got a dog with a coat on...it probably makes it a little bit easier for people to understand."

Parents reported the dogs provided numerous benefits regarding community access in relation to improved regulation, visibility, positive community interaction, and safety. Many felt this was the most significant benefit of the program.

Hopes for the Future

Participants expressed hope that assistance dogs could continue to benefit their child. Some saw the potential regarding safety; the dog could alert parents and prevent elopement.

Malcolm, whose son has an assistance dog, stated:

"he knows he's safe. Cause if there is anything dangerous or whatever, [his dog] is gonna take care of him. So, that's what I think is being brought to the table. The security is overwhelming. I think the benefits are just phenomenal."

Others hoped an assistance dog could engender community acceptance and access. Rochelle, who also has an assistance dog for her son, shares:

"It means now that we can go out, so a few times we've been out for dinner and we take [the dog] with us and she sits on the floor. [My son] sits on the floor in the corner with her. We

can have dinner and a conversation. We can do things now that we haven't been able to do in the past.”

Lollie expressed her hopes for the future with an assistance dog, having tried so many other things:

“I've just got high hopes that in the end that [a dog] will be able to help a bit more. I think you get to the stage where you've tried everything, things can be very overwhelming, parents often are exhausted. But I think working with assistance dogs is like that ray of light.”

Some felt five sessions was an insufficient period to measure progress. However, many reported they would have continued the therapy if available. No negative outcomes or regression due to participation in the program were reported.

Discussion

The author found no previous published work addressing parent perspectives of AAT for ASD. This study is the first of its kind to explore parent perspectives of AAT for children with ASD. Findings suggest that the dog's innate characteristics, developed from centuries of co-habitation and interdependence, make the dog compatible with therapy goals (Morey, 2010). A dog's ability to lend itself well to therapeutic outcomes is not merely chance; “dogs' social skill in cooperative-communication contexts are a case of convergent evolution with humans” (Hare, 2007, pg. 61). This study indicates that the presence of the dog in therapy is valuable for addressing communication, regulation, and community access goals. The participant's reflections on dogs as nonjudgmental, nonverbal communicators supports the notion that dog's interaction and responsiveness to humans has great therapeutic potential.

This study raises the importance of enjoyment and therapeutic play as a means of supporting intrinsic motivation. Parents consistently reported that the dog's promotion of enjoyment and engagement translated into motivation to complete therapeutically beneficial tasks. Findings

suggest the dog has an ability to engage and motivate therapy participants to extend themselves beyond their current boundaries. This can result in goal attainment in non-preferred activities that are difficult for therapists to impact. Parent's insightful reflections on the role of motivation in therapeutic gains are supported by "research suggesting that enhancing children's motivation to become active partners in the therapeutic process results in greater treatment gains" (Sams et. al., 2006, pg 273). Self motivated participations are associated with improved outcomes (Kuhl et. al., 2003; Schreibman et. al., 2015). The Self Determination Theory asserts

When people are autonomously motivated, they act with a full sense of willingness and volition, wholly endorsing that which they are doing because they find it either interesting and enjoyable, or consistent with their deeply held, integrated values. Autonomous motivation is typically accompanied by the experience of positive affect, flexibility, and choice. (Deci & Ryan, 2015, pg. 486)

Parents reported that the interaction with the dog was an incentive and therapy was both the motivation and the reward. AAT's ability to incorporate these critical factors is a promising formula for positive therapy outcomes for both the participant and their families.

This study found that AAT improved community access due to the dog's ability to provide safety, keep the child focused and regulated, and increase visibility within the community. Stigma is often reported as a consequence of the invisibility of the diagnosis (Corcoran et. al. 2015). The dog allows families to take the therapeutic effects of the dog with them into the community and continue to benefit from the presence of the dog. The transferable and mobile nature of this therapy is distinctive. Parents reported an ease of accessing the community in areas that would otherwise be difficult due to constraints they faced from their child's dysregulation, maladaptive behaviors, or restrictive routines. In the event of problematic behaviors, many parents felt that the dog could act as a visual signifier to the public that their child had a disability and in turn reduce the negative feedback from the public. This therapy is applicable to numerous environments and allows therapists to extend their practice outside of

a clinical environment. Using the dog to access the environment in a way that is safe and supportive allows therapists to facilitate contextualized community goals that can be difficult to recreate in a clinical space (Kuhl et. al., 2003, Schreibman et. al., 2015).

There is a large emphasis on early intervention for children with ASD. As a result, many people with ASD experienced reduced levels of therapy beyond the age of seven (Warren et. al, 2011). The age span of the therapy participants (4-19 years of age) indicates that this intervention is appropriate for varying age groups. AAT distinguishes itself in its ability to benefit clients irrespective of age. This asset is an important consideration for this population given ASD is a chronic disorder.

There are several limitations to this study. Limitations associated with self-report and volunteer bias are applicable to this study including inaccuracies and over emphasis (positive or negative) (Tai & Ajjawi, 2016). Parents who wish to encourage further research into interventions for their children may overstate benefits of the intervention. The participants are primarily women and as a result the research has a female majority perspective. Children may be involved in several therapies concurrently so reports on gains may not be entirely due to this intervention. This research does not include the perspective of the children/adolescents in the therapy. The sample of participants have experienced one organization's iteration of AAT so the results may not be generalizable. However, the purpose of this study was an in-depth exploration of the parent's experience of this therapy program. Recommendations for further research include larger cohorts with control groups and qualitative studies exploring the perspective of the therapist.

Conclusion

This study provides a valuable contribution to the literature due to the attention paid to parent perspective. By discussing their personal experience, parents provided insights into the mechanisms of AAT. Parents felt the nonverbal and nonjudgmental characteristics of the dog promoted engagement, enjoyment, and intrinsic motivation were key elements of productive therapy. This information can guide therapists in intervention design and implementation in the future. Findings indicate that parents perceive AAT as a beneficial intervention for their child with ASD. This study provides guidance for further research as to what domains to focus on within therapy and contributes to the evidence base necessary for larger studies that can employ the highest quality research strategies.

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Appendix A



**Discipline of Occupational
Therapy
Faculty of Health Sciences**

Dr Lynette Mackenzie
Associate Professor

Room J104
The University of Sydney
NSW 2006 AUSTRALIA
Telephone: +61 2 93519832
Facsimile: +61 2 93519962
Email: lynette.mackenzie@sydney.edu.au
Web: <http://www.sydney.edu.au/>

Parent perspectives on outcomes of a therapeutic program with children and adolescents with Autism using trained assistance dogs

PARTICIPANT INFORMATION STATEMENT

1. What is the study about?

You are invited to take part in a research study about your perspectives on the outcomes of occupational therapy for your child with Autism spectrum disorder (ASD) using assistance dogs. After the sessions are complete we will conduct parent interviews to explore your experience and perspectives on the sessions. The purpose of this study is to contribute to the clinical knowledge of the use of assistance dogs for children with ASD.

You have been invited to participate in this study because of your child's involvement with the program. This Participant Information Statement tells you about the research study. Knowing what is involved will help you decide if you want to take part in the research. Please read this sheet carefully and ask questions about anything that you don't understand or want to know more about.

Participation in this research study is voluntary.

By giving your consent to take part in this study you are telling us that you:

- ✓ Understand what you have read.
- ✓ Agree to take part in the research study as outlined below.
- ✓ Agree to the use of your personal information as described.

You will be given a copy of this Participant Information Statement to keep.

2. Who is running the study?

The study is being carried out by the following researchers:

- The Faculty of Health Sciences at the University of Sydney, and Assistance Dogs Australia

- Lead investigator: Associate Professor Lynette Mackenzie.
- Additional investigators: Dr Meryl Lovarini, Occupational Therapist Claire Dickson,
- Student researcher Maeve Condon is conducting this study as the basis for the degree of Master's of Occupational Therapy at The University of Sydney under the supervision of the above lead researcher

3. What does the study involve for me?

The study will ask you to complete an interview with a research team member after your child's completion of ADA therapy sessions. The interview is intended to take up to one hour and will consider your perspective on the sessions and any outcomes you associate with the therapy. The interview can take place in a neutral location or over the phone. The interview will be audio recorded.

You will be invited to receive a project summary at the conclusion of the project summarising the main findings from this study.

4. How much time will the study take?

The interview is intended to take no longer than one hour. The interview is predicated on your presence at your child's therapy sessions that take 5.5 hours over 5 consecutive weeks.

5. Who can take part in this study?

Parents whose child has participated in the therapy sessions through Assistance Dogs Australia are eligible to participate in this study. Parents who participate must have been present at the therapy sessions.

6. Do I have to be in the study? Can I withdraw from the study once I've started?

Being in this study is voluntary and you do not have to take part. Your decision to participate will not affect your current or future relationship with researchers or anyone else at the University of Sydney or Assistance Dogs Australia. Please contact the research team if you wish to withdraw.

You are free to stop the interview at any time. Unless you say that you want us to keep them, any recordings will be erased and the information you have provided will not be included in the study results. You may also refuse to answer any questions that you do not wish to answer during interview.

7. Are there any risks or costs associated with being in the study?

When talking about your family and child experiences with therapy and Autism Spectrum Disorder, there may be feelings of distress
Inconvenience or giving up time to participate in the research project

8. Are there any benefits associated with being in the study

While we cannot guarantee you will receive any direct benefits from being in the study, the research around treatment interventions that benefit children with ASD may benefit the future of the community impacted. Improved understanding of the role of assistance dogs for children with Autism will help improve clinical practice and meet the needs of children with ASD.

9. What will happen to the information about me that is collected during the study

- ✓ Demographic information and personal perspectives on the therapy sessions will be gathered
- ✓ Audio recordings will be analysed and may be used for publication in a written report
- ✓ Individual participants will not be identifiable in written document.
- ✓ Only the research investigators will have access to participants' information and it will be kept secure and confidential
- ✓ Participants can request transcripts and analysis from the study at any time by contacting the research team
- ✓ Data will be retained for the duration of the study, audio will be destroyed at the conclusion of the study
- ✓ Data collected in this project will not be used for any purpose outside this study

WHERE WILL DATA BE STORED DURING AND AFTER STUDY

By providing your consent, you are agreeing to us collecting personal information about you for the purposes of this research study. Your information will only be used for the purposes outlined in this Participant Information Statement, unless you consent otherwise.

Your information will be stored securely and your identity/information will be kept confidential, except as required by law. Study findings may be published. Although every effort will be made to protect your identity, there is a risk that you might be identifiable in publications due to the nature of the study and/or the results.

10. Can I tell other people about the study?

Yes, you are welcome to tell other people about the study.

11. What if I would like further information about the study or my involvement in it?

When you have read this information Lynette Mackenzie, Meryl Lovarini, Claire Dickson, or Maeve Condon will be available to discuss it with you further and answer any questions you may have. If you would like to know more about this study at any stage, please feel free to contact Lynette Mackenzie at lynette.mackenzie@sydney.edu.au or Meryl Lovarini at meryl.lovarini@sydney.edu.au Claire Dickson at cdickson@assistancedogs.org.au or Maeve Condon at mcon7912@uni.sydney.edu.au

12. Will I be told the results of the study?

You have a right to receive feedback about the overall results of this study. If you would like feedback please indicate your preferred form of feedback and address:

Postal: _____

Email: _____

13. What if I have a complaint or any concerns?

Research involving humans in Australia is reviewed by an independent group of people called a Human Research Ethics Committee (HREC). The ethical aspects of this study have been approved by the HREC of the University of Sydney [project number: 2017/877]. As part of this process, we have agreed to carry out the study according to the National Statement on Ethical Conduct in Human Research (2007). This statement has been developed to protect people who agree to take part in research studies.

If you are concerned about the way this study is being conducted or you wish to make a complaint to someone independent from the study, please contact the university using the details outlined below. Please quote the study title and project number.

The Manager, Ethics Administration, University of Sydney:

- Telephone: +61 2 8627 8176
- Email: ro.humanethics@sydney.edu.au
- Fax: +61 2 8627 8177 (Facsimile)

This information sheet is for you to keep

Appendix B



THE UNIVERSITY OF
SYDNEY



**Assistance Dogs
Australia**
Giving Freedom & Independence

**Discipline of Occupational
Therapy**

Faculty of Health Sciences

CHIEF INVESTIGATOR
A/Prof Lynette Mackenzie

Room J104
The University of Sydney
NSW 2006 AUSTRALIA
Telephone: +61 2 93519832
Facsimile: +61 2 93519962
Email:
Lynette.Mackenzie@sydney.edu.au
Web: <http://www.sydney.edu.au/>

PARTICIPANT CONSENT FORM

**Parent Perspective on outcomes of a therapeutic program with children and adolescents
with Autism using trained assistance dogs**

PARENT/CARER CONSENT FORM

I,[PRINT NAME], agree to
participate in this research study.

In giving my consent I state that:

- ✓ I understand the purpose of the study, what I will be asked to do, and any risks/benefits involved.
- ✓ I have read the Participant Information Statement and have been able to discuss my involvement in the study with the researchers if I wished to do so.
- ✓ The researchers have answered any questions that I had about the study and I am happy with the answers.
- ✓ I understand that being in this study is completely voluntary and I do not have to take part. My decision whether to take part in the study will not affect my relationship with the researchers or anyone else at the University of Sydney or Assistance Dogs Australia now or in the future.
- ✓ I understand that I can withdraw from the study at any time.
- ✓ I understand that I may stop the interview session at any time if I do not wish to continue, and that unless I indicate otherwise any recordings will then be erased and the information provided will not be included in the study. I also understand that I may refuse to answer any questions I don't wish to answer.

- ✓ I understand that personal information about myself and my child that is collected over the course of this project will be stored securely and will only be used for purposes that I have agreed to. I understand that information about myself and my child will only be told to others with my permission, except as required by law.
- ✓ I understand that the results of this study may be published, and that publications will not contain my name or any identifiable information about myself.

I consent to:

- Participating in an audiotaped interview YES
NO
- Reviewing transcripts YES NO

Would you like to receive feedback about the overall results of this study?

YES NO

If you answered YES, please indicate your preferred form of feedback and address:

Postal: _____

Email: _____

Parent/carer signature:

Child's signature (if appropriate):

.....
Signature

.....
Signature

.....
PRINT name

.....
PRINT name

.....
Date

.....
Date

Researcher's signature:

Date.....

Appendix C

OUTCOMES OF A THERAPEUTIC PROGRAM WITH CHILDREN AND ADOLESCENTS WITH AUTISM USING TRAINED ASSISTANCE DOGS

INTERVIEW SCHEDULE FOR PARENTS/CAREGIVERS

Can you tell me why you decided to participate in the program with your child?

- What led to the decision
- Previous experiences of interventions for your child
- Specific things that attracted you to the program
- Why you thought it might help

Can you tell me a little about your Child?

- Strengths
- Interests

Did you see any of their strengths emerge in the session and their interaction with the dog?

Can you describe the difficulties your child faced prior to the program?

- Social
- Behavioural
- Play
- Development
- Anything else

How do these difficulties impact on you or your family?

- Relationships
- Communication
- Routines
- Family activities
- Anything else

What among these were you hoping to address through Animal Assisted Therapy (AAT)?

Regarding the social stories that ADA provided:

- Have you used social stories before, are they helpful to your child?
- Did you find them useful or supportive for your child for entering this new therapy?
- How often did you use the social story?

How do you think your child responded to the program sessions?

- Things you observed during the sessions
- Things you observed after the sessions
- How much of the responses were related to the dog

What were the differences you saw from the first to the last sessions

What symptoms did it target most effectively?

What have the outcomes have been for your child as a result of participating in the program?

- Any changes identified that have lasted
- Any impact on the family or other social structures the child is involved in that you attribute to the AAT
- Any examples you'd like to share

Do you think that the presence of the dog added something unique to the therapy that you can't get through other means?

- do you think that added presence of the dog was valuable, if so, in what ways?
 - Can you identify what worked and what didn't?

Did you observe anything within these sessions that was different from what you've observed elsewhere (other therapies, other environments such as home or school)?

Did you participate in the session? If so, how did the presence of the dog facilitate your interaction with your child?

How did your child interact with the dog, were there things that surprised, excited, or disappointed you about that interaction?

- Are there other things in their life that illicit those reactions?

Had you considered applying for an assistance dog prior to attending these sessions?

Would you consider applying for an assistance dog following the sessions?

What do you think were the positive things about the program?

What do you think were the challenging things about the program?

What would you say to any other parents or caregivers considering participating in the program?

Thinking back, is there anything you want to clarify or elaborate on that we've discussed?

Is there anything we haven't discussed that you would like to add

Appendix D

THE UNIVERSITY OF
SYDNEY

Research Integrity & Ethics Administration

Human Research Ethics Committee Tuesday, 10 January 2017

Assoc Prof Lynette Mackenzie Ageing Work and Health Unit; Faculty of Health Sciences

Email: lynette.mackenzie@sydney.edu.au

Dear Lynette

The University of Sydney Human Research Ethics Committee (HREC) has considered your application.

After consideration of your response to the comments raised your project has been approved. Approval is granted for a period of four years from 10 January 2017 to 10 January 2021

Project title: Outcomes of a therapeutic program with children and adolescents with Autism using trained assistance dogs

Project no.: 2016/984

First Annual Report due: 10 January 2018

Authorised Personnel: Mackenzie Lynette; Dickson Claire; Lovarini Meryl Patricia;

Documents Approved:

Date	Type	Document
18/11/2016	Version 1	Interview schedule for parents and caregivers
18/11/2016	Version 1	FHS video recording release form
18/11/2016	Version 1	Baseline participant assessment
18/11/2016	Version 1	Observation sheet
20/11/2016	Version 1	Outcome measure: Autism Treatment Evaluation Checklist
21/11/2016	Version 1	Flyer for interested participants at the information session
21/11/2016	Version 1	Consent form
05/01/2017	Version 2	Revised participant information statement

Condition/s of Approval

- Research must be conducted according to the approved proposal.
- An annual progress report must be submitted to the Ethics Office on or before the anniversary of approval and on completion of the project.
- You must report as soon as practicable anything that might warrant review of ethical approval of the project including:
 - Serious or unexpected adverse events (which should be reported within 72 hours).
 - Unforeseen events that might affect continued ethical acceptability of the project.
- Any changes to the proposal must be approved prior to their implementation (except where an amendment is undertaken to eliminate immediate risk to participants).
- Personnel working on this project must be sufficiently qualified by education, training and experience for their role, or adequately supervised. Changes to personnel must be reported and approved.
- Personnel must disclose any actual or potential conflicts of interest, including any financial or other interest or affiliation, as relevant to this project.
- Data and primary materials must be retained and stored in accordance with the relevant legislation and University guidelines.

Research Integrity & Ethics Administration Level 2, Margaret Telfer Building (K07) The University of Sydney NSW 2006 Australia

T +61 2 9036 9161 E human.ethics@sydney.edu.au W sydney.edu.au/ethics

ABN 15 211 513 464 CRICOS 00026A



- Ethics approval is dependent upon ongoing compliance of the research with the National Statement on Ethical Conduct in Human Research, the Australian Code for the Responsible Conduct of Research, applicable legal requirements, and with University policies, procedures and governance requirements.
- The Ethics Office may conduct audits on approved projects.
- The Chief Investigator has ultimate responsibility for the conduct of the research and is responsible for ensuring all others involved will conduct the research in accordance with the above. This letter constitutes ethical approval only. Please contact the Ethics Office should you require further information or clarification. Sincerely

Associate Professor Stephen Assinder Chair Human Research Ethics Committee (HREC 1)

The University of Sydney HRECs are constituted and operate in accordance with the National Health and Medical Research Council's (NHMRC) National Statement on Ethical Conduct in Human Research (2007) and the NHMRC's Australian Code for the Responsible Conduct of Research (2007).

Appendix E

MANUSCRIPT FORMAT

All JADD manuscripts should be submitted to Editorial Manager in 12-point Times New Roman with standard 1-inch borders around the margins.

APA Style

Text must be double-spaced; APA Publication Manual standards must be followed.

As of January 20, 2011, the Journal has moved to a double-blind review process. Therefore, when submitting a new manuscript, DO NOT include any of your personal information (e.g., name, affiliation) anywhere within the manuscript. When you are ready to submit a manuscript to JADD, please be sure to upload these 3 separate files to the Editorial Manager site to ensure timely processing and review of your paper:

- A title page with the running head, manuscript title, and complete author information. Followed by (page break) the Abstract page with keywords and the corresponding author e-mail information.
- The blinded manuscript containing no author information (no name, no affiliation, and so forth).
- The Author Note

Types of papers

Articles, Commentaries Brief Reports, Letters to the Editor

- The preferred article length is 20-23 double-spaced manuscript pages long (not including title page, abstract, tables, figures, addendums, etc.) Manuscripts of 40 double-spaced pages (references, tables and figures counted as pages) have been published. The reviewers or the editor for your review will advise you if a longer submission must be shortened.

Review your manuscript for these elements

1. Order of manuscript pages

Title Page with all Author Contact Information & Abstract with keywords and the corresponding author e-mail information.

Blinded Manuscript without contact information and blinded Abstract, and References

Appendix

Figure Caption Sheet

Figures

Tables

Author Note

Manuscript Submission

Submission of a manuscript implies: that the work described has not been published before; that it is not under consideration for publication anywhere else; that its publication has been approved by all co-authors, if any, as well as by the responsible authorities – tacitly or explicitly – at the institute where the work has been carried out. The publisher will not be held legally responsible should there be any claims for compensation.

Permissions

Authors wishing to include figures, tables, or text passages that have already been published elsewhere are required to obtain permission from the copyright owner(s) for both the print and online format and to include evidence that such permission has been granted when submitting their papers. Any material received without such evidence will be assumed to originate from the authors.

Text Formatting

Manuscripts should be submitted in Word.

- Use a normal, plain font (e.g., 10-point Times Roman) for text.
- Use italics for emphasis.
- Use the automatic page numbering function to number the pages.
- Do not use field functions.
- Use tab stops or other commands for indents, not the space bar.
- Use the table function, not spreadsheets, to make tables.
- Use the equation editor or MathType for equations.
- Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

Headings

Please use no more than three levels of displayed headings.

Abbreviations

Abbreviations should be defined at first mention and used consistently thereafter.

Footnotes

Footnotes can be used to give additional information, which may include the citation of a reference included in the reference list. They should not consist solely of a reference citation, and they should never include the bibliographic details of a reference. They should also not contain any figures or tables.

Footnotes to the text are numbered consecutively; those to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data).

Footnotes to the title or the authors of the article are not given reference symbols.

Always use footnotes instead of endnotes.

Acknowledgments

Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be written in full.

Body

- The body of the manuscript should begin on a separate page. The manuscript page header (if used) and page number should appear in the upper right corner. Type the title of the paper centered at the top of the page, add a hard return, and then begin the text using the format noted above. The body should contain:
 - Introduction (The introduction has no label.)
 - Methods (Center the heading. Use un-centered subheadings such as: Participants, Materials, Procedure.)
 - Results (Center the heading.)
 - Discussion (Center the heading.)

Headings

Please use no more than three levels of displayed headings.

Level 1: Centered

Level 2: Centered Italicized

Level 3: Flush left, Italicized

Author Note

The first paragraph contains a separate phrase for each author's name and the affiliations of the authors at the time of the study (include region and country).

The second paragraph identifies any changes in the author affiliation subsequent to the time of the study and includes region and country (wording: “authors name is now at affiliation”.) The third paragraph is Acknowledgments. It identifies grants or other financial support and the source, if appropriate. It is also the place to acknowledge colleagues who assisted in the study and to mention any special circumstances such as the presentation of a version of the paper at a meeting, or its preparation from a doctoral dissertation, or the fact that it is based on an earlier study.

The fourth paragraph states, “Correspondence concerning this article should be addressed to...” and includes the full address, telephone number and email address of the corresponding author.

Terminology

- Please always use internationally accepted signs and symbols for units (SI units).

Scientific style

- Generic names of drugs and pesticides are preferred; if trade names are used, the generic name should be given at first mention.
- Please use the standard mathematical notation for formulae, symbols etc.:

Italic for single letters that denote mathematical constants, variables, and unknown quantities

Roman/upright for numerals, operators, and punctuation, and commonly defined functions or abbreviations, e.g., cos, det, e or exp, lim, log, max, min, sin, tan, d (for derivative)

Bold for vectors, tensors, and matrices.

References

Citation

Cite references in the text by name and year in parentheses. Some examples:

- Negotiation research spans many disciplines (Thompson 1990).
- This result was later contradicted by Becker and Seligman (1996).
- This effect has been widely studied (Abbott 1991; Barakat et al. 1995; Kelso and Smith 1998; Medvec et al. 1999).

Reference list

The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications and unpublished works should only be mentioned in the text. Do not use footnotes or endnotes as a substitute for a reference list.

Reference list entries should be alphabetized by the last names of the first author of each work.

- Journal article
Harris, M., Karper, E., Stacks, G., Hoffman, D., DeNiro, R., Cruz, P., et al. (2001). Writing labs and the Hollywood connection. *Journal of Film Writing*, 44(3), 213–245.
- Article by DOI
Slifka, M. K., & Whitton, J. L. (2000) Clinical implications of dysregulated cytokine production. *Journal of Molecular Medicine*, doi:10.1007/s001090000086
- Book
Calfee, R. C., & Valencia, R. R. (1991). *APA guide to preparing manuscripts for journal publication*. Washington, DC: American Psychological Association.
- Book chapter

O'Neil, J. M., & Egan, J. (1992). Men's and women's gender role journeys: Metaphor for healing, transition, and transformation. In B. R. Wainrib (Ed.), *Gender issues across the life cycle* (pp. 107–123). New York: Springer.

- Online document
Abou-Allaban, Y., Dell, M. L., Greenberg, W., Lomax, J., Peteet, J., Torres, M., & Cowell, V. (2006). Religious/spiritual commitments and psychiatric practice. Resource document. American Psychiatric Association.
- http://www.psych.org/edu/other_res/lib_archives/archives/200604.pdf. Accessed 25 June 2007.

Journal names and book titles should be italicized.

For authors using EndNote, Springer provides an output style that supports the formatting of in-text citations and reference list.

- [EndNote style \(zip, 3 kB\)](#)

Tables

- All tables are to be numbered using Arabic numerals.
- Tables should always be cited in text in consecutive numerical order.
- For each table, please supply a table caption (title) explaining the components of the table.
- Identify any previously published material by giving the original source in the form of a reference at the end of the table caption.
- Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body.

Each table should be inserted on a separate page at the back of the manuscript in the order noted above. A call-out for the correct placement of each table should be included in brackets within the text immediately after the phrase in which it is first mentioned. Copyright permission footnotes for tables are typed as a table note.

ETHICAL RESPONSIBILITIES OF AUTHORS

This journal is committed to upholding the integrity of the scientific record. As a member of the Committee on Publication Ethics (COPE) the journal will follow the COPE guidelines on how to deal with potential acts of misconduct.

Authors should refrain from misrepresenting research results which could damage the trust in the journal, the professionalism of scientific authorship, and ultimately the entire scientific endeavour. Maintaining integrity of the research and its presentation can be achieved by following the rules of good scientific practice, which include:

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- No data have been fabricated or manipulated (including images) to support your conclusions
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- Consent to submit has been received explicitly from all co-authors, as well as from the responsible authorities - tacitly or explicitly - at the institute/organization where the work has been carried out, **before** the work is submitted.
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- If the article is still under consideration, it may be rejected and returned to the author.
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- The author's institution may be informed.

COMPLIANCE WITH ETHICAL STANDARDS

To ensure objectivity and transparency in research and to ensure that accepted principles of ethical and professional conduct have been followed, authors should include information regarding sources of funding, potential conflicts of interest (financial or non-financial), informed consent if the research involved human participants, and a statement on welfare of animals if the research involved animals.

Authors should include the following statements (if applicable) in a separate section entitled "Compliance with Ethical Standards" when submitting a paper:

- Disclosure of potential conflicts of interest
- Research involving Human Participants and/or Animals
- Informed consent

Please note that standards could vary slightly per journal dependent on their peer review policies (i.e. single or double blind peer review) as well as per journal subject discipline. Before submitting your article check the instructions following this section carefully. The corresponding author should be prepared to collect documentation of compliance with ethical standards and send if requested during peer review or after publication. The Editors reserve the right to reject manuscripts that do not comply with the above-mentioned guidelines. The author will be held responsible for false statements or failure to fulfill the above-mentioned guidelines.

DISCLOSURE OF POTENTIAL CONFLICTS OF INTEREST

Authors must disclose all relationships or interests that could influence or bias the work. Although an author may not feel there are conflicts, disclosure of relationships and interests affords a more transparent process, leading to an accurate and objective assessment of the work. Awareness of real or perceived conflicts of interests is a perspective to which the readers are entitled and is not meant to imply that a financial relationship with an organization that sponsored the research or compensation for consultancy work is inappropriate. Examples of potential conflicts of interests **that are directly or indirectly related to the research** may include but are not limited to the following:

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- Financial support for educational programs
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- Support from a project sponsor
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The corresponding author collects the conflict of interest disclosure forms from all authors. In author collaborations where formal agreements for representation allow it, it is sufficient for the corresponding author to sign the disclosure form on behalf of all authors. Examples of forms can be found

- here:

The corresponding author will include a summary statement **on the title page that is separate from their manuscript**, that reflects what is recorded in the potential conflict of interest disclosure form(s).

See below examples of disclosures:

Funding: This study was funded by X (grant number X).

Conflict of Interest: Author A has received research grants from Company A. Author B has received a speaker honorarium from Company X and owns stock in Company Y. Author C is a member of committee Z.

If no conflict exists, the authors should state:

Conflict of Interest: The authors declare that they have no conflict of interest.

1) Statement of human rights

When reporting studies that involve human participants, authors should include a statement that the studies have been approved by the appropriate institutional and/or national research ethics committee and have been performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

If doubt exists whether the research was conducted in accordance with the 1964 Helsinki Declaration or comparable standards, the authors must explain the reasons for their approach, and demonstrate that the independent ethics committee or institutional review board explicitly approved the doubtful aspects of the study.

The following statements should be included in the text before the References section:

Ethical approval: “All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.”

For retrospective studies, please add the following sentence:

“For this type of study formal consent is not required.”

2) Statement on the welfare of animals

The welfare of animals used for research must be respected. When reporting experiments on animals, authors should indicate whether the international, national, and/or institutional guidelines for the care and use of animals have been followed, and that the studies have been approved by a research ethics committee at the institution or practice at which the studies were conducted (where such a committee exists).

For studies with animals, the following statement should be included in the text before the References section:

Ethical approval: “All applicable international, national, and/or institutional guidelines for the care and use of animals were followed.”

If applicable (where such a committee exists): “All procedures performed in studies involving animals were in accordance with the ethical standards of the institution or practice at which the studies were conducted.”

If articles do not contain studies with human participants or animals by any of the authors, please select one of the following statements:

“This article does not contain any studies with human participants performed by any of the authors.”

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“This article does not contain any studies with human participants or animals performed by any of the authors.”

INFORMED CONSENT

All individuals have individual rights that are not to be infringed. Individual participants in studies have, for example, the right to decide what happens to the (identifiable) personal data gathered, to what they have said during a study or an interview, as well as to any photograph that was taken. Hence it is important that all participants gave their informed consent in writing prior to inclusion in the study. Identifying details (names, dates of birth, identity numbers and other information) of the participants that were studied should not be published in written descriptions, photographs, and genetic profiles unless the information is essential for scientific purposes and the participant (or parent or guardian if the participant is incapable) gave written informed consent for publication. Complete anonymity is difficult to achieve in

some cases, and informed consent should be obtained if there is any doubt. For example, masking the eye region in photographs of participants is inadequate protection of anonymity. If identifying characteristics are altered to protect anonymity, such as in genetic profiles, authors should provide assurance that alterations do not distort scientific meaning.

The following statement should be included:

Informed consent: “Informed consent was obtained from all individual participants included in the study.”

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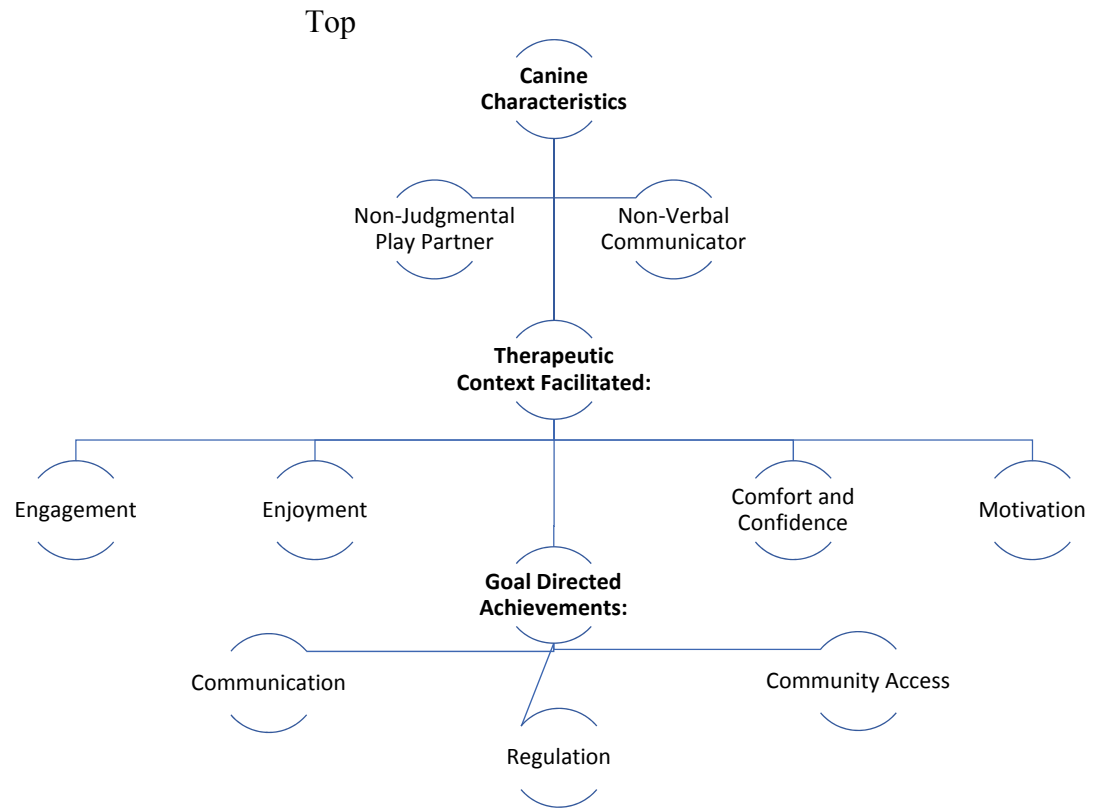
“Additional informed consent was obtained from all individual participants for whom identifying information is included in this article.”

Figures Caption Sheet

Figure 1. Results tree

Figures

Figure 1. Results tree



Tables

Table 1 Demographics

Participant	Child Gender	Child Age	Parent Gender
Malcolm	Male	7	Male
Raquel	Male	6	Female
Anne	Male	8	Female
Rochelle	Male	11	Female
Noemie	Male	4	Female
Calpernia	Male	6	Female
Creighton	Male	Not reported	Male
Michelle	Female	19	Female
Gabriela	Male	13	Female
Jane	Male	4	Female
Lollie	Male	14	Female
Nell	Male	8	Female
Emmett	Male	15	Male
Pru	Male	7	Female
Tessa	Male	7	Female
Noel	Male	8	Female
Katarina	Male	5	Female

Table 2 Reported Symptoms

Participant	Sensory	Motor	Regulation	Developmental Delay	Socialization	Routine Dependent	Maladaptive Behavior
Malcolm	✓		✓		✓	✓	✓
Raquel			✓	✓	✓	✓	✓
Anne			✓			✓	✓
Rochelle	✓		✓		✓	✓	✓
Noemie	✓		✓		✓	✓	✓
Calpernia	✓		✓		✓	✓	✓
Creighton	✓			✓	✓	✓	✓
Michelle	✓		✓	✓	✓	✓	✓
Gabriela		✓	✓		✓	✓	✓
Jane				✓	✓		✓
Lollie	✓		✓		✓	✓	✓
Nell	✓					✓	✓
Emmett			✓		✓	✓	✓
Pru		✓				✓	✓
Tessa	✓		✓	✓	✓		✓
Noel	✓				✓	✓	✓
Katarina	✓		✓		✓	✓	✓

Table 3 Reported Therapies

Participant	Occupational Therapy	Speech Pathology	Psychology	Music Therapy	Social Skills Program	Hippotherapy	Sensory Program	Applied Behavioral Analysis Therapy
Malcolm	✓							
Raquel	✓	✓						
Anne	✓	✓		✓				
Rochelle	✓	✓	✓		✓			
Noemie	✓	✓	✓	✓				
Calpernia	✓	✓						
Creighton								
Michelle								
Gabriela			✓		✓			
Jane	✓	✓						
Lollie	✓	✓		✓		✓	✓	
Nell	✓	✓						
Emmett	✓	✓	✓					
Pru	✓					✓		
Tessa		✓						
Noel	✓	✓						✓
Katarina	✓							✓

Authors Note

Maeve Doyle Condon, The Faculty of Health Sciences at the University of Sydney, Australia. Associate Professor Dr. Lynette Mackenzie, The Faculty of Health Sciences at the University of Sydney, Australia. Associate Professor Dr. Meryl Lovarini, The Faculty of Health Sciences at the University of Sydney, Australia. Claire Dickson, Assistance Dogs Australia, Sydney, Australia. Alberto Alvarez-Campos, Assistance Dogs Australia, Sydney, Australia

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Correspondence concerning this article should be addressed to:

Maeve Doyle Condon

255 Hull Cove Farm Rd, Jamestown, RI, USA, 02835.

+1 401 239 4884

maevedoylec@gmail.com