

**Parent Perspectives: The Value of Trained Dogs in Animal Assisted Therapy for
Children and Adolescents with Autism Spectrum Disorder**

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Thesis submitted in partial fulfilment of the requirements of the degree of Master of
Occupational Therapy

Discipline of Occupational Therapy
Faculty of Health Sciences
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Acknowledgements

Completion of this thesis would not have been possible without the generous support and contribution of many dedicated individuals. I would like to extend my sincere thanks to my two academic supervisors, Associate Professor Lynette Mackenzie and Dr Meryl Lovarini, for their ongoing guidance, valuable insights and genuine encouragement. I would like to also express my gratitude to Claire Dickson, Occupational Therapist at Assistance Dogs Australia and Alberto Alvarez-Campos, Director of Operations at Assistance Dogs Australia. Through the provision of continuing practical support and expert guidance their contribution has been significant throughout the several phases of this project. Finally, I would like to thank my family, partner and friends for constantly cheering me on from the sidelines and providing unending support, positivity and encouragement throughout this process.

Thesis Abstract

Background/Aim: Dogs show promise as being able to elicit positive therapy outcomes for children with Autism Spectrum Disorder (ASD). While research interest in Animal Assisted Therapy (AAT) for ASD continues to grow, the parent perspective regarding the value and contribution of trained dogs to the therapy process has not yet been explored. This study aims to investigate parent perspectives regarding the contribution of trained dogs in a short-term AAT program for children with ASD.

Methods: This thesis presents a literature review examining the evidence assessing AAT for ASD. Following this, the outcomes of a qualitative study will be presented. 16 semi-structured telephone interviews were conducted with parents following their child's completion of an AAT program. Interviews were audio-taped and transcribed verbatim. Using Nvivo, thematic analysis was employed to identify prevalent themes in the data. Line by line coding and consensus theme refinement were employed to improve trustworthiness.

Findings: Three themes emerged from the data. Parents valued that the trained dog supported their children in and beyond the clinic-based sessions in the areas of: stress and anxiety management; engagement and participation; and social-communication.

Conclusion: Parents valued that the presence of the trained dogs elicited positive therapy outcomes across three domains. The trained dogs provided a calming effect that supported child stress management both in and beyond the sessions during the program. The dogs facilitated child engagement and participation in several life-skill activities and community access. The dogs also supported social-communication and social-interaction. Future rigorous, controlled studies should investigate how best to target AAT with trained dogs for children with ASD to maximise the therapeutic benefit.

Keywords: animal assisted therapy, animal assisted intervention, pet therapy, dog assisted therapy

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Literature Review

Autism Spectrum Disorder (ASD) is a lifelong condition, typically diagnosed in early childhood (American Psychiatric Association [APA], 2013). ASD is characterised by a spectrum of social skill and communication difficulties as well as the expression of restricted and repetitive interests and/or behaviours (APA, 2013). As awareness of ASD has grown, so too has the number of therapies which vary according to focus, interventionist and intensity (Goin-Kochel, Myers, & Mackintosh, 2007). Animal Assisted Intervention (AAI) has received growing research interest as an ASD therapy. Preliminary findings suggest that AAI involving either dogs, horses or llamas, may promote positive verbal and non-verbal social behaviours in children and adolescents with ASD, while simultaneously lessening the expression of isolating and aggressive behaviours (O’Haire, 2013). Despite these positive early findings, the parent perspective on the contribution of trained dogs involved in AAT therapy sessions has not yet been explored, to the author’s knowledge. This literature review will provide an overview of ASD, the parenting experience related to ASD, existing therapies for ASD, the theory underlying how AAI may impact on the social and communication skills of children and adolescents with ASD, the evidence evaluating AAI for ASD, and will appraise the evidence for Animal Assisted Therapy, a subcategory of AAI, for children and adolescents with ASD. Throughout this review, the term ‘child’ will be used to refer to both young children and adolescents. Likewise, the term ‘parent’ will also include caregivers.

Aims of the Literature Review

The literature review aims to critically appraise the existing literature examining Animal Assisted Therapy for children with ASD.

Search Strategy

To identify relevant studies, several databases were searched including Medline, Scopus, CINAHL and OT Seeker. Google Scholar, the reference lists of relevant articles and ASD clinical guidelines were also searched. Search terms included; 'autism', 'autism spectrum disorder', 'animal assisted therap*', 'animal* assist*', 'animal* facilitate*', 'animal assisted intervention', 'pet therap*', 'pediatrics', 'paediatric', 'child', 'adolescent', 'youth', and 'young people'.

Theoretical Position

To situate this thesis in occupational therapy theory, the Person Environment Occupation Model (PEO; Law et al., 1996) has been selected to guide the interpretation of the content addressed by this literature review. The PEO model posits that human performance is influenced by a mutual interaction between the individual's personal capacities, their environments (including social, physical and institutional) and the occupation or activity which they are undertaking (Law et al., 1996). Performance of the occupation is enhanced when the fit between the person, their environments and the occupation is optimised. The relevance of this model to ASD lies in the fact that any difficulty faced by the individual is not solely attributable to the individual's unique characteristics and skills, but rather an ongoing interaction between the PEO components, making it possible for therapists to support an individual's performance by working with them to enhance the fit between each of the PEO factors.

1. Autism Spectrum Disorder (ASD)

1.1. Definition & Symptomatology

“It is often said that when one meets one person with autism spectrum disorder (ASD), one has simply met one person with ASD” (Lurie-Marks, Lurie, & Schutt, 2016, p. 465). This statement encapsulates the wide variability in ASD symptoms given the spectrum nature of the condition. ASD is defined as a lifelong neurodevelopmental condition with common symptoms including social and communication skill difficulties, as well as restricted interests and/or repetitive motor behaviours (APA, 2013).

Beyond the defining symptoms of ASD, there is a high prevalence of anxiety disorders amongst individuals with ASD (Spain, Sin, Linder, McMahon, & Happé, 2018). The typical characteristics of ASD may thwart social interactions and heighten the risk of social anxiety (Spain et al., 2018). Difficulty interpreting the mental states of others, known as theory-of-mind, has been implicated to partially explain the social insight difficulties which may affect some individuals with ASD (Jones, Dawson, Kelly, Estes, & Webb, 2017; Tager-Flusberg, 2007). Neuroimaging studies have indicated that when engaging in social cognition tasks, atypical neural activation is seen in individuals with ASD when compared to neurotypical controls (Zurcher & Hooker, 2016). Moreover, neuroimaging studies indicate that individuals with ASD may rely on general problem-solving neural networks, rather than dedicated social-cognition neural centres, to engage in theory-of-mind tasks (Frith & Frith, 2003).

Sensory processing difficulties across a range of sensory inputs may affect individuals with ASD and can present as either hypo- or hyper-sensitivity (Ben-Sasson et al., 2009; Tidmarsh & Volkmar, 2003). Sensory processing difficulties may lead individuals with ASD to engage in sensory seeking or avoidance behaviours, as a means of coping with sensory experiences

(Stornelli, 2016). One such example noted by Tomchek and Dunn (2007) is that individuals with ASD may display unique visual behaviours, including dominance of the peripheral-vision system and avoidance of eye-contact. The sensory-processing difficulties seen in ASD have also been linked to challenges with self-regulation. To compensate, individuals with ASD may develop self-stimulating sensory behaviours to achieve self-regulation, that may be expressed as hand flapping, rapid body movement and/or self-injurious behaviours (Watling & Dietz, 2007). The net-effect of the sensory processing difficulties and the associated compensatory behaviours may result in occupational performance issues with daily living tasks and social interactions (Spain et al., 2018; Stornelli, 2016). These behaviours may also make it difficult for a child to attend to and engage with therapy activities (Watling & Dietz, 2007).

Cognitive deficits, developmental delay and intellectual disability may also be associated with ASD and could affect occupational performance in life activities (Bhat et al., 2014; Randall et al., 2016). Notably, up to 30% of individuals with ASD demonstrate highly specialised skill-sets known as 'savant skills' (Howlin, Goode, Hutton, & Rutter, 2009). Savant skills may include highly advanced cognitive abilities such as superior memory and enhanced cognitive processing skills, linked to exceptional performance with mathematics, art and music (Bennett & Heaton, 2012).

ASD is associated with the expression of externalising and internalising behaviours.

Externalising behaviours may include hyperactivity, impulsivity and conduct problems (Jeste & Geschwind, 2014; Randall et al., 2016). In contrast, internalising behaviours may include mood disturbances such as anxiety and depression (Randall et al., 2016). While the expression of these behaviours vary from child to child, given the spectrum nature of the

condition, externalising and internalising behaviours may serve as a source of stress for some parents of children with ASD (Craig et al., 2016).

2. The Parenting Experience: Raising a Child with ASD

2.1. Positive Parenting Experiences

Efforts to investigate the parenting experiences of parents of children with ASD have tended to frame the experience negatively (Phelps, McCammon, Wuensch, & Golden, 2009).

Woodgate, Ateah, and Secco (2008) explored the positive aspects of raising a child with ASD and found that parents reported that they experienced joy by embracing the varied small successes experienced by their children. Engaging in advocacy to improve healthcare systems for both their own children and other families was also found to be a source of meaning for parents in the study (Woodgate et al., 2008). Other research found that the advocacy involved in accessing appropriate therapy and education services for their children, granted parents a sense of competence and achievement (Stein, Foran, & Cermak, 2011). In these ways, the experience of raising a child with ASD may provide parents with varied opportunities for occupational engagement and enhanced occupational performance with respect to the myriad of parenting activities inherent to the parenting role.

Research has also suggested that successful adaptation to raising a child with ASD may provide parents a strong sense of resilience (Lurie-Marks et al., 2016). Phelps et al. (2009), illustrated that some parents experience the process of gaining knowledge regarding how best to support a child with ASD as an important form of self-actualisation. Parenting competency may also be boosted when parents learn to successfully and positively support their child's behaviour (Stein et al., 2011). Thus, raising a child with ASD may provide parents with opportunities to experience meaning and competency in the parenting role.

2.2. Unique Parenting Challenges

While acknowledging the positive aspects of raising a child with ASD provides a balanced overview of the parenting experience, the unique challenges that some parents experience should not be minimised. Research suggests that some parents of children with ASD may experience role conflict and reduced social integration (Stein et al., 2011). One qualitative study indicated that mothers of children with ASD reported experiencing restricted choice and opportunity to engage in restorative activities and that mothers typically reported social isolation due to role imbalances (Safe, Joosten, & Molineux, 2012). The demands placed on some parents to support the adaptive functioning and occupational performance of their children with respect to self-care occupations and social interactions, may limit opportunities to pursue other meaningful activities (Giovagnoli et al., 2015). Parents may also experience the vigilance and planning required to support child behaviour as stressful and a source of emotional strain (Craig et al., 2016; Safe et al., 2012; Seymour, Wood, Giallo, & Jellett, 2013).

In addition to the ongoing daily challenges, parents are tasked with the responsibility of navigating healthcare systems. This includes identifying effective and appropriate treatment options and managing the financial strain associated with therapy costs (Mackintosh, Goin-Kochel, & Myers, 2012; Stein et al., 2011). Parents may also play an instrumental role in the implementation of therapy, especially in the home environment, which may further extend the role conflict experienced by some parents (Safe et al., 2012; Woodgate et al., 2008).

While research examining the ASD parenting experience longitudinally is limited, the existing longitudinal research suggests that the stressors facing parents may shift over time (Barker et al., 2011). It has been reported that as some parents become older and less able to

provide care for their children with ASD, they experience considerable stress concerning their child's future and ongoing support needs (Lurie-Marks et al., 2016). One longitudinal study spanning 10 years found that the chronic heightened stress facing some parents of children with ASD, led to a long-term outcome of parents experiencing ongoing low mood, which persisted despite the child no longer living in the family home (Barker et al., 2011). However, anxiety symptoms were found to reduce as child behaviour improved over time (Barker et al., 2011). Interestingly, strong informal support networks were found to act as a protective factor against maternal psychological distress in later life (Barker et al., 2011). This factor is critical considering that families of children with ASD typically report facing social isolation due to ASD stigma (Stein et al., 2011). Thus, while the research related to the experience of raising a child with ASD typically relies on subjective measures and is commonly cross-sectional in design, there is some evidence that the experience of raising a child with ASD may present some parents with unique challenges and stressors.

3. ASD Therapy Approaches

3.1. Pharmaceutical Intervention

Pharmaceutical medications have been used to complement ASD therapy-based interventions (Cauffman, 2013). The strength of the evidence supporting pharmaceutical interventions for ASD varies according to the class of drug used. Stimulant medications may be used to manage attention and hyperactivity difficulties that may be associated with ASD, with strong evidence supporting their efficacy including several trials with robust measures taken to reduce the risk of bias including placebo-comparison groups, blinding and randomisation (Aman, Farmer, Hollway, & Arnold, 2008). Selective serotonin reuptake inhibitors (SSRI) may be prescribed for restrictive and repetitive motor behaviours that may be experienced by individuals with ASD (Coury et al., 2012). The evidence supporting the prescription of SSRIs

for ASD is less clear. Carrasco, Volkmar, and Bloch (2012) conducted a meta-analytic review of five randomised placebo-controlled trials, examining the outcomes of SSRIs on repetitive, restricted behaviours. The authors found small but significant positive effects of SSRIs on restricted and repetitive behaviours, however, contended that given the small effect size, evidence of publication bias within the body of literature examining SSRI use for ASD was likely (Carrasco et al., 2012). A Cochrane Review assessing randomized controlled trials examining SSRI use for children with ASD supported the conclusion put forward by Carrasco et al. (2012), claiming that SSRI use for children with ASD is not supported by the evidence (Williams, Wheeler, Silove, & Hazell, 2011).

3.2. Non-Pharmaceutical Interventions

As widespread awareness of ASD continues to grow, so do the number of therapy options (Goin-Kochel, Myers, & Mackintosh, 2007). ASD therapies vary according to the mode of delivery, intensity, therapist and therapeutic goals. Interventions centred around behavioural modulation have the strongest evidence base. Applied Behaviour Analysis (ABA) and Early Intensive Behaviour Intervention, are two common behaviour-based interventions targeting communication skills, adaptive skills and behaviour modulation (Foss-Feig et al., 2011). A defining feature of behaviour-based interventions is their time intensity, typically involving 20-40 hours of intervention per week for up to three years (Virués-Ortega, 2010; Autism Speaks, 2018). Behavioural intervention principles are designed to be applied incidentally across the day to maximise the child's exposure to learning opportunities, making parents integral to the therapy process (Virués-Ortega, 2010).

Meta-analytic review evidence indicates that gains related to ABA may include enhanced intellectual functioning, expressive and receptive language skills, adaptive and social skills

and to a lesser extent, non-verbal communication skills (Makrygianni, Gena, Katoudi & Galanis, 2018). Australian practice guidelines for the treatment of ASD recommend ABA as the most efficacious therapy for ASD (Prior & Roberts, 2012). According to the guidelines, ABA is the only ASD therapy (including both behaviour based and other therapy approaches) that is accepted as an empirically supported efficacious treatment (Prior & Roberts, 2012). The evidence for Early Intensive Behaviour Interventions is less rigorous. Systematic review evidence examining Early Intensive Behavioural Interventions demonstrates positive outcomes in the domains of language development, adaptive functioning and intellectual functioning (Foss-Feig et al., 2011). However, the authors noted that the methodological rigour of some of the studies included in the systematic review were weak, increasing the risk of biased study results (Foss-Feig et al., 2011).

3.3. Impact on Parents

Parents are often expected to be integral to the therapy process, implementing therapy at home to promote the generalisability of therapy gains and the time intensity of therapy (Burrell & Borrego, 2012). The intensity of the most evidence-based interventions for ASD, that is, behavioural-interventions, may place additional demands on parents. Shepherd, Landon, Goedeke, Ty, and Csako (2018) engaged parents via a survey to determine their appraisal of common ASD therapies. Their findings revealed that while parents rated that they perceived intensive ABA to be an effective therapy for ASD, completion rates were the lowest for intensive ABA compared to the other therapies included in the study (Shepherd et al., 2018). Moreover, heightened parenting stress has been linked to reduced therapy outcomes, especially with the implementation of highly intensive therapies (Goin-Kochel et al., 2007). This finding is significant considering that it has been reported across the literature that parents of children with ASD experience stress and role-conflict (Craig et al., 2016; Safe

et al., 2012; Seymour et al., 2013). Thus, considering that the parenting experience may be significantly influenced by raising a child with ASD, and parents are placed with the decision-making power to determine the investment of their therapy dollars, it is worth exploring the parent perspective regarding a clinic-based treatment approach for ASD.

4. Animal Assisted Intervention (AAI)

4.1. AAI Terminology

There is confusion in the AAI literature around terminology, an issue that undermines the clarity of research in the field and comparability of AAI studies. According to Animal Assisted Intervention International (2018), AAI is an umbrella term comprising three categories: Animal Assisted Therapy (AAT); Animal Assisted Education (AAE) and Animal Assisted Activities (AAA). AAT and AAE are similar in that they are delivered by a specifically trained health professional (AAT) or educational professional (AAE), and are structured and goal directed. AAA are distinct in that they are delivered by a volunteer animal handler, and the activities are neither goal directed nor structured.

4.2. Human-Animal Interaction Theory: The Case for Pets

Friedmann, Katcher, Lynch, and Thomas (1980) asserted that pet ownership is health promoting for three principal reasons, namely that pets; incentivise physical activity, reduce anxiety through their physical contact and protect against loneliness through their ongoing companionship. Pet ownership also provides humans with opportunities for occupational engagement through the nurturing, protection and bonding with animals, affording individuals a sense of purpose and meaning (Fine & Beck, 2015). In addition to providing companionship to their owners, pets provide avenues to social capital acting as social lubricants to stimulate social interactions, thereby further countering loneliness (Serpell,

2011; Wood, 2011). Pets also provide unconditional and enduring social support, which promotes human physical and mental health (Serpell, 2011).

Pet ownership also serves as a buffer against stress experienced by owners. It has been documented that pet owners demonstrate more resilience in the face of life stressors and require less medical support from general practitioners than non-pet owners (Siegel, 1990). Human-animal interactions have also been reported to influence the secretion of certain hormones. Petting an animal has been linked to increased secretion of oxytocin, a hormone linked to attachment and bonding (Prothmann & Fine, 2011). Odendaal (2000) also demonstrated that oxytocin and beta-endorphin secretion increased when owners interacted with their pets; while cortisol levels, a stress-related hormone, dropped (Odendaal, 2000). These physiological responses may go some way in explaining the stress-reducing and health promoting effects of human-animal interactions.

4.3. The Case for Dogs

The Biophilia Hypothesis posits that humans evolved to show an innate interest in nature and living creatures, developing attachments to animals that promote human survival (Wilson, 1984 as cited by Carlisle, 2015). With evolution, humans came to rely on non-aggressive animals to interpret cues indicating environmental danger, ultimately promoting survival (Fine & Beck, 2015). Through this mechanism, dogs and humans came to mutually benefit one another, providing protection, shelter and ultimately companionship (Walsh, 2009). The mutual benefit experienced by both dogs and humans produced a process of convergent evolution (Hare & Tomasello, 2005). This is thought to explain the remarkable ability dogs possess to accurately read and respond to human verbal and non-verbal communication (Hare

& Tomasello, 2005). This evolutionary background provides some context for the relevance of dogs in the therapy process.

Frequently labelled as the pioneer of AAT, Levinson (1975, as cited by Serpell, 2011) observed that his pet dog “Jingles”, facilitated rapport building and the development of therapeutic alliances with withdrawn children visiting his psychiatry practice. Levinson (1975, as cited by Serpell, 2011) theorised that the dog’s non-judgemental and attentive demeanour facilitated the therapy process. Temple Grandin (2011), a well renowned animal-behaviour author and academic, and an individual with ASD, provides a unique and valuable perspective. Grandin (2011) suggests that the congruence between the ways in which she and animals process and perceive the world, serves as a bridge that aides her understanding of their behaviours and intentions.

The calm and non-judgemental disposition of certain dogs may encourage social engagement from some individuals with ASD (Esposito, McCune, Griffin, & Maholmes, 2011; O’Haire, 2013). It has been suggested that due to their communication through non-verbal cues only, dogs’ communication signals may be easier to interpret and comprehend, especially for individuals with social-communication challenges (Prothmann, Ettrich, & Prothmann, 2009). Some children with ASD demonstrate a strong interest in and desire to interact with dogs. Prothmann et al. (2009) observed children with ASD in a room filled with toys, a trained dog and a friendly adult. The children showed strongest preference for interacting with the dog, followed by the person and then the toys (Prothmann et al., 2009). Their findings demonstrate that some children with ASD may be drawn to and motivated to initiate social interactions with specifically selected dogs. Rederer and Goodman (1989) also contend that dogs present as strong multisensory stimuli that capture attention and inspire interaction. Moreover, being

intentional and socially motivated beings, dogs may serve as a powerful adjunct to therapy (Prothmann & Fine, 2011). Aside from the unique characteristics seen in dogs, pragmatic factors also promote their use in therapy. For example, due to their size dogs can work in smaller environments than llamas and horses which have also been used in AAI applications (O’Haire, 2013). For these reasons, the remainder of this review will consider applications of AAI using trained dogs.

4.4. Animal Assisted Intervention & ASD: Evidence from Systematic Reviews

Considering the confusing in the literature regarding AAI terminology, evidence regarding AAI will be appraised in two sections. This section will appraise systematic review evidence synthesising studies examining AAI with a range of definitions and protocols and using a range of animals. Section 4.5 will exclusively assess studies investigating interventions consistent with the currently accepted AAI definitions, terminology and protocols recommended by Animal Assisted Intervention International (2018).

Three systematic reviews have evaluated AAI for ASD. The first by Berry, Borgi, Francia, Alleva, and Cirulli (2013) assessed AAI studies using dogs. While the systematic review claimed to assess the evidence for AAI using dogs for ASD, two of the six included studies assessed the placement of assistance dogs in the homes of families of children with ASD. Assistance dogs are in a separate class of human-animal interaction and their placement does not constitute AAI as defined by Animal Assisted Intervention International (2018). Of the four studies included in the review that did assess AAI, three used repeated measure designs and the remaining study used a case-study design. The four studies found that during AAI sessions, the participants demonstrated increased social-communication use, eye-contact and social engagement. The case-study also found that the participant demonstrated less aggressive and withdrawal behaviours during the AAI intervention. While these initial

findings are promising, the absence of randomisation and blinding makes these findings preliminary and requiring further validation through rigorous controlled trials (Berry et al., 2013).

O'Haire (2013, 2017) conducted systematic reviews assessing the evidence investigating AAI for ASD using a range of animals including dogs, horses, llamas and guinea pigs. Fourteen studies were included in the first review, two of which assessed assistance dog placement in the home. Most studies used single-subject or pre-post designs (O'Haire, 2013). Only one of the studies employed randomisation to a control group, although most studies did employ comparison groups (O'Haire, 2013). The findings of the first review suggest that the strongest AAI outcome is increased social-interaction, including social verbal and non-verbal behaviours. Improvements in language and communication were also found, with participants in the studies included in the reviews displaying motivation to discuss topics related to the animals during the intervention period. Three of the studies included in the review assessed impulsive and aggressive behaviours. While one of these studies assessed assistance dog placement in the home, the remaining two found that AAI resulted in enhanced positive behaviour, with significant reductions in aggressive and impulsive behaviours during the AAI intervention period.

The updated systematic review found that the methodological rigour improved in the years following the initial review, with over half of the included studies utilising quantitative methodologies (O'Haire, 2017). The updated review included 28 studies, most of which employed repeated measures designs. Four studies were randomized controlled trials. The outcomes associated with AAI replicated the findings from the previous systematic review.

Again, the most frequently reported AAI outcome was increased social interactions (O’Haire, 2017). Studies measuring externalising and internalising behaviours showed mixed results, with half of the studies demonstrating that these behaviours did not change with AAI intervention. Some studies found small changes in hyperactivity and aggression. Restricted and repetitive behaviours did not significantly improve following AAI. These findings indicate that AAI is unlikely to improve these behavioural expressions that may present with ASD (O’Haire, 2017). Despite the improvements in methodological rigour demonstrated by the studies in the updated systematic review, the effectiveness of AAI for improved social interactions and social communication needs to be confirmed with replication of the findings produced by the most rigorous studies that have investigated AAI for ASD (O’Haire 2017).

4.5. Animal Assisted Therapy for ASD

While several studies have aimed to examine AAT for ASD, most fail to meet the currently accepted definition of AAT as defined by Animal Assisted Intervention International (2018), with the notable exception of two studies. Using a repeated measures design, Becker, Rogers, and Burrows (2017) compared a treatment schedule of Social Skills Training (SST) and AAT including a dog, with standard SST. Teacher-report measures indicated that the participants in the AAT-SST group showed gains in social skills and social communication while simultaneously showing reductions in restricted and repetitive behaviours. Participants in the AAT-SST group also reported reductions in perceived loneliness, depressive symptoms and increased perceived social competence. Grigore and Rusu (2014) compared the outcomes of combining Social Stories and AAT with a dog, to a standard Social Stories treatment program alone. The study used a single subject research design with three participants. While limited by inadequate statistical power, the results showed that the combined treatment approach resulted in increased initiation of social interaction and a reduced dependency on social

prompting. While these findings are promising, further research is required, employing rigorous methodologies and larger sample sizes, to investigate the effectiveness and the optimal dosage of AAT as a treatment for ASD.

5. Research Gap

5.1. Parent Perspective Regarding AAT for ASD

Beyond the limitations inherent within the current body of research evidence examining AAT for ASD, a significant gap in knowledge exists. To the author's knowledge, there are no published studies to date considering the parent perspective related to the value and contribution of trained dogs in AAT programs for ASD. Parents serve as an essential information source as they are experts in knowing their children. The developmental stages of children engaged in AAT programs may also preclude them from providing detailed insight regarding the therapy experience, making the parent voice essential. Parents also witness their children in natural, non-controlled environments allowing them to provide insight regarding the generalisability of the therapy outcomes to other environments and situations. Given the expert-knowledge that parents have regarding their children, they may also be able to provide insights regarding the "small-wins" that they observe in the therapy setting that are important gains for their child that may not be detectable using standardised outcome measures (Curtin & Fossey, 2007). Parents also hold decision making power to determine where and how they will invest their therapy dollars. Thus, given these considerations, it is necessary to explore parents' perspectives on the perceived value and contribution of trained dogs in AAT.

6. Conclusion

This review of the literature investigating AAT as a therapy for ASD shows promising findings. The gains reported in social communication and social engagement in children with ASD, warrants further investigation into this therapeutic approach. Methodological weaknesses across the literature highlights the need for rigorous studies investigating AAT for ASD. In addition, to the author's knowledge, the parent perspective has not been explored to investigate the value of AAT with trained dogs for ASD. Investigation of the parent perspective is critical, as parents are well placed to provide meaningful and nuanced insights regarding their children's participation in AAT. Insights regarding how the dog facilitates the participation of children and adolescents with ASD both during and after the therapy sessions, may also inform the design of relevant outcome measures. Such measures may then be utilised in more rigorous studies to capture the effects of AAT for ASD with greater validity and reliability.

7. The Proposed Research

Using a phenomenological approach, the parent perspective will be explored to investigate the perceived value and contribution of trained dogs in an AAT program. Parents of children who have completed a five-week occupational therapy-based AAT program involving trained dogs will be interviewed to answer the following research question:

According to the parent perspective, what is the perceived value and contribution of trained dogs in and beyond AAT sessions?

Exploration of the parent perspective regarding the role played by trained dogs in an AAT program for ASD will address an important research gap. Unpacking the value and

contribution that trained dogs add to the therapeutic process will provide therapists with further insights and information regarding this growing therapeutic approach to inform clinical decisions.

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Manuscript

Parent Perspectives: The Value of Trained Dogs in Animal Assisted Therapy for Children and Adolescents with Autism Spectrum Disorder

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Acknowledgments:

This research was made possible by a generous funding grant from S-Centre Group
(Westfield).

Abstract

Dogs may elicit positive therapy outcomes for children with Autism Spectrum Disorder (ASD). Despite growing research into Animal Assisted Therapy (AAT) for ASD, the parent perspective has not yet been fully engaged. This study aimed to explore parent perspectives regarding AAT. Sixteen semi-structured interviews were conducted with parents following their child's completion of an AAT program. Thematic analysis, line by line coding and consensus theme refinement were used for data analysis. Three themes emerged. Parents valued that the dogs supported child: stress and anxiety management; engagement and participation; and social-communication. Parents valued the dogs as having a calming effect that facilitated child participation in several life-skill activities and social-communication. Future studies should investigate how best to target AAT with dogs for children with ASD.

Keywords: animal assisted therapy, animal assisted intervention, pet therapy, dog assisted therapy

Parent Perspectives: The Value of Trained Dogs in Animal Assisted Therapy for Children and Adolescents with Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition which is characterised by social-communication difficulties and the expression of restricted, repetitive motor behaviours and interests (American Psychiatric Association, 2013). Research has illustrated that parents of children with ASD may experience heightened stress and psychological distress compared to parents of typically developing children, and children with other developmental disabilities (Estes et al., 2009; Rao & Beidel, 2009). Parents of children with ASD may also experience role conflict, serving as parent, advocate and therapist (Stein et al., 2011). Parents may also experience limited engagement in other meaningful activities and social participation, further compounding the psychological distress experienced (Giovagnoli et al., 2015; Stein et al., 2011).

Animal Assisted Intervention (AAI) shows promise in eliciting therapy gains for children with ASD. The rationale for involving animals in therapy stems from research investigating the effect of human-animal-interactions (O'Haire, 2013). Human-animal-interactions are thought to promote human health (Serpell, 2011) and to moderate the human stress response by lowering cortisol levels (Odendaal, 2000). Some children with ASD also demonstrate motivation to initiate and sustain interactions with specifically selected dogs (Prothmann, Ettrich, & Prothmann, 2009). The characteristic traits of dogs as intentional and socially motivated beings, and their strong multisensory features, suggest that dogs may serve as a powerful addition to therapy (Prothmann & Fine, 2011; Redefers & Goodman, 1989).

Animal Assisted Therapy (AAT) is a goal-directed, structured therapeutic approach led by a health professional (Animal Assisted Intervention International, 2018). While several studies have investigated AAT for ASD, few have applied the accepted definition. One study employing the accepted definition, used a repeated measures design to compare a treatment protocol of AAT with dogs combined with Social Skills Training versus Social Skills Training alone. The combination therapy fostered social skill and social communication gains, while restricted and repetitive behaviours declined (Becker, Rogers, & Burrows, 2017). Similarly, Grigore and Rusu (2014) used a single-case design with three participants to compare the outcomes of combining Social Stories and AAT with dogs to a standard Social Stories program. The combined therapy approach promoted more gains than the Social Stories program alone. In the combined condition, social behaviours including the initiation of social interactions increased, while dependency on prompting decreased. These results demonstrate positive outcomes associated with AAT, however, due to the limited methodological rigour of the extant studies examining AAT, the efficacy of the approach remains unknown (Davis et al., 2015)

Aside from the methodological limitations across the AAT literature, a significant research gap exists. To the author's knowledge, the parent perspective has not yet been engaged to explore the perceived value and contribution of trained dogs to the therapy process. Investigation of the parent perspective is critical as parents are well placed to provide nuanced insights regarding their children's participation in AAT, allowing for the detection of valuable information which may not be captured by quantitative outcome measures (Curtin & Fossey, 2007). Accordingly, this study aims to investigate the parent perspective regarding an occupational therapy-based AAT program involving trained dogs to answer the research

question: according to the parent perspective, what is the perceived value and contribution of the trained dogs in and beyond the AAT sessions?

Methods

Study Design

The qualitative study employed a phenomenological approach to gain a detailed understanding of the lived experience of the participants with respect to the AAT program (Groenewald, 2004). The philosophical stance of social constructivism, which holds that knowledge is complex and constructed by the individual through their life experiences, guided the research (Creswell, 2014; Tavakol & Sandars, 2014). The researcher's subjective position was also integral to the data collection and interpretation processes (Tavakol & Sandars, 2014). Specifically, the principal researcher's (KR) interpretations were shaped by a white, middle class background and training in occupational therapy. Given the qualitative design of this study, the findings are not intended to generalise to all parents of children with ASD, but rather to explore the lived experience of the group of parents involved in the study.

Recruitment

Purposive sampling was utilised to recruit participants with experience relevant to the research topic (Groenewald, 2004). Participants were sampled from an existing pool of parents forming part of a larger study conducted jointly by Assistance Dogs Australia (ADA) and the University of Sydney (USyd). Participants were recruited from urban and regional areas of New South Wales, Australia. Participants were parents of children with ASD whose children had completed five occupational therapy-based AAT sessions at the ADA clinic. The AAT sessions were facilitated by an occupational therapist. A trained dog and dog trainer were involved in all sessions. While the occupational therapist engaged with the child and the dog,

the dog trainer primarily focused on the dog. The first AAT session was 90 minutes and the four subsequent sessions were one hour each. Sessions involved structured therapeutic activities, targeting goal-orientated behaviour including social-communication, self-care skills and developmentally appropriate adaptive skills (e.g., handwriting and play skills). The activities were framed around the trained dogs, with children interacting directly with the dogs with scaffolding from the therapist, making the dogs central to the sessions.

Participants were recruited for interviewing at three time points following their child's completion of the AAT program, approximately three, six and nine months follow up. The occupational therapist conducting the therapy sessions provided parents with information regarding the qualitative study. The participants provided informed consent to participate. Prior to the commencement of each interview, verbal consent was also obtained.

Participants were included in the study if they met the inclusion criteria of having attended at least two AAT sessions at the ADA clinic with their child. This was done to ensure that parents were sufficiently informed to respond to the interview questions. English fluency was also required as none of the researchers were multilingual. Participants were excluded if they had an assistance dog living in the home as this may have confounded the study results, making it difficult to determine whether the parent reported outcomes related to the dog in the home or clinic environment. However, participants on the waiting list for an assistance dog from ADA were included.

Sampling was pursued according to the principle of data saturation. Data analysis occurred concurrently with data collection to identify the emergence of repetitive findings and themes which served to indicate data saturation (DiCicco-Bloom & Crabtree, 2006). Ethics approval for the study was obtained under the USyd Research Integrity & Ethics Administration

(reference number: 2016/984).

Data Collection Method

A semi-structured interview was selected as the data collection method, in line with the phenomenological approach and social constructivist paradigm shaping the study. The semi-structured interview employed open-ended questions to engage interviewees with sufficient flexibility to actively explore meaning of the phenomena with the participant (DiCicco-Bloom & Crabtree, 2006). An interview schedule was developed by the principal researcher and reviewed by an expert-reviewer at ADA and the research team. The interview schedule included 12 open-ended questions and was applied flexibly to guide the interview process (Liamputtong, 2013).

Data Analysis

Thematic analysis is a systematic data analysis approach that allows researchers to identify commonalities in the participants' experiences, relevant to the research questions (Braun & Clarke, 2006). Accordingly, thematic analysis was employed using the recommendations outlined by Braun and Clarke (2006). To conduct thematic analysis, all interviews were audio-recorded and transcribed verbatim. Line by line coding was then used following multiple readings of the transcripts by the principal researcher. Independent coding was also conducted by two members of the research team (LM and ML). Similar codes were collated to draw out initial themes identifying common experience shared by participants. The research team then explored the themes thoroughly to gain a deeper understanding of the value parents placed on the trained dogs involved in the AAT program.

Three members of the research team (KR, LM and ML) met regularly to engage in consensus theme refinement. Member-checking was also employed, providing participants an

opportunity to review and adjust their transcripts. The principal researcher maintained a field diary documenting a growing understanding of the phenomenon throughout the research process. The field diary was also considered as part of the data analysis process as the principal researcher discussed the content of the field diary during theme refinement meetings. These strategies have been recommended by several authors to promote the trustworthiness of qualitative research (Braun & Clarke, 2006; Cope, 2014; Curtin & Fossey, 2007).

Findings

A total of 16 interviews were completed, achieving data saturation. Participant characteristics are detailed in Table 1, including information about the parents and their children.

Pseudonyms have been selected to protect participant identities.

[Insert table 1]

Table 2 presents an overview of the parent reported diagnostic information of the children involved in the AAT program. This information has not been verified.

[Insert table 2]

Table 3 presents information regarding the parent reported primary motivation for having their children join the program.

[Insert table 3]

Three themes emerged regarding the perceived value and contribution of trained dogs in and beyond AAT sessions provided by an occupational therapist. These themes were: *stress and anxiety management; engagement and participation; and social-communication.*

Theme 1: Stress and Anxiety Management

Stress and Anxiety Management in the Sessions:

Overwhelmingly, parents reported the presence of the dog moderated their child's experience of stress and anxiety. Parents either conceptualised the dog's presence as 'calming' or were more explicit in describing their observations regarding their child's arousal levels when interacting with the dogs. Evelyn shared that the dog's presence helped to:

"...shut off that fight and flight... instead of cortisol, [her son] had good hormones flowing through his body and I could see his face was relaxed, his body was relaxed."

Witnessing their children in a relaxed state, with anxiety and stress visibly reduced, was a valued contribution of the dogs' presence for most parents.

Stress and Anxiety Management Beyond the Sessions:

For parents who reported their children experienced anxiety and reported that they were motivated to enrol their child to support stress and anxiety management, carry over outcomes were noted. These parents reported that during the five-week therapy block, stress-management outcomes served to facilitate school attendance. Jenna recalled that her adolescent son had articulated that following the AAT sessions, he felt more comfortable attending school:

"...I found that my older boy would say to me, 'Mum, I feel so much more at ease', because he would do the sessions and then go to school."

Likewise, Clara shared that her daughter:

“...was just happy to go to school, she was just in public... more relaxed.”

Beyond school, some parents noted that their children were calmer at home, following the sessions. Adeline indicated that during the program:

“...there were a lot less arguments at home... I think it kept [her daughter] calmer... it gave her a different focus.”

These parents valued the ongoing stress-management outcomes associated with interacting with the trained dog that supported child participation in salient environments and activities during the treatment block. However, none of the parents reported that these stress and anxiety management outcomes maintained at the time of interview.

Theme 2: Engagement and Participation

The Dogs Facilitated Engagement and Participation in the Sessions:

Parents unanimously agreed that the presence of the dogs served to facilitate engagement and participation in therapy activities. Several parents valued that the dogs shifted the ‘spotlight’ away from the child during sessions, reducing the experience of social pressure. Parents also noted that engagement was heightened by children being ‘interested’ in activities that involved the dogs. Danielle valued that her child was:

“...engaging with the occupational therapist...following [her] visual and verbal prompts.”

Many parents reported that it was the dogs' unique traits that contributed to engagement and participation. Philip valued how his daughter enjoyed the dog's uninhibited display of joy during a session:

"...the dog was very, very excited... [my daughter] was so impressed and excited about seeing that sort of reaction."

The majority of parents valued that their children demonstrated high levels of attention during the sessions. Adeline conceptualised this as her daughter being 'present' in the sessions, enabling her to pay attention and follow instructions. Adam valued his son's focus during sessions:

"The most positive thing I think was [his son's] attention... he was totally focused. Where in any other session or whatever he would not be focused."

Some parents valued that their children successfully transitioned between session activities without resistance, which these parents reported differed from their child's typical difficulty with transitions. For non-verbal and some younger children, parents reported that while their children demonstrated some resistance to transitions in the sessions, they complied more readily than they would have outside of the AAT sessions. Despite improvements seen in the sessions, parents overwhelmingly reported that these gains did not transfer home during or after the five-week program.

Doing Activities for and with the Dogs Facilitated Engagement and Participation:

Universally, parents valued that their children were motivated to do activities for and with the dogs, which promoted engagement and participation. For parents of children with sensory

processing difficulties, it was valued that the dogs' enthusiasm promoted their child's willingness to engage with new sensory inputs. Sophie described that:

"...the dog fetched the tennis ball and it was like soggy and wet... and [my son] hated it... and then [the dog] was looking so excited to play again and he actually picked the ball up and did it again, and again and again. I was quite shocked."

For children displaying avoidance of loud and crowded environments, their parents valued that the dogs facilitated their children to engage with community activities despite their sensory sensitivities. Amelia recalled:

"We went with the dog to walk around Aldi. And Aldi and [my daughter], any shopping, you know it's the light, it's the noise, and normally within five seconds, 'I need to use the toilet.. And she walked around the whole Aldi with [the dog]...I've not seen her like that."

Of the subset of parents reporting 'to improve self-care and life-skills' as the motivation for enrolling their child in the program, the dogs' presence promoted engagement and participation in non-preferred life-skill activities. Helen shared that her young son engaged in handwriting in the presence of the dog:

"...he doesn't like to write so he was engaging in that with less...refusal. He would normally just flat out refuse."

Some parents of younger children reported that their child found it difficult to move on at program conclusion, due to attachment to the dog. Thus, while the presence of the dog was valued as facilitating engagement and participation, this was reported for some children to translate to the experience of emotional upset following separation from the dog.

Transfer of Skills and Confidence:

Several parents also reported valuing that their child's engagement and participation in the session activities transferred to other life-skills and enhanced confidence. Erin reported that her young child's experience of assisting the dog with toileting activities supported him to learn how to toilet independently:

"We'd watch [the dog] do a wee, so we took photos...and that's how we toilet trained [her son] with weeing on the grass. Initially he just weed on the grass for the first few months and [now] he actually wees on the toilet."

Evelyn described how her son's engagement in taking photographs of the dogs supported his confidence:

"Just being with the dogs was such a good thing for him, plus being able to take the photographs and get some feedback... so that he knows he's done something well, because he doesn't think he does anything well."

High levels of engagement and participation provided some families with strategies to enhance life-skill development. A few parents noted that following success at using utensils in the session to prepare the dogs' meals, parents could encourage their children to engage in independent feeding at home, during the five-week treatment block.

Theme 3: Social-Communication

Dogs Served as a Stimulus for Communication in the Sessions:

Parents of younger children valued that the dogs provided an opportunity for verbal communication skill refinement. This stemmed from the dogs' requirement for precise verbal

and non-verbal communication cues, providing essential practice for young children. Helen noted that:

“If he gave a command and it wasn’t clear enough, he was encouraged to give a second command and then the dog would respond. I think it was that, ‘I give a command and she responds’ that was integral”.

With regards to adolescents, most parents valued that the dogs facilitated their adolescent children to engage in self-expression and sharing. Jenna recalled that her older son:

“Would talk to [the therapist] while he was doing the activities with the dog, he would open up about things that were troubling him or things at school... it was just very releasing for him.”

Regardless of the character of the verbal communication elicited by the presence of the dogs, parents universally valued that their children were engaging in verbal communication.

The Dogs Facilitated Successful Interactions in the Sessions:

For some children, the dogs facilitated successful interactions both in the clinic environment and in the community. Some parents felt that the dogs served as catalysts for social communication with community members. Theresa shared that her son was:

“...like a different kid. He was totally focussed on that person and what they were asking him. It was very open whereas before he’d be; eyes darting and he wouldn’t be able to focus. Just the way that he concentrated on the person... and no eye darting, bolting or melting down, it was amazing.”

Parents valued that the dogs' presence appeared to serve as an anchoring point from which interactions and conversations could flow more easily between the children and others.

Verbal Communication Beyond the Sessions:

Most of the parents valued that during the five-week therapy program, their children were motivated to share their experiences about the program. For many children, this involved talking about the sessions at home with family members. Linda shared that her son would:

"...come home and tell me all about it. Very excited about it and excited about [the dog] and the people as well and the things they were doing. That was a real positive."

Parents reported their children were motivated to share their experiences "with anyone who would listen". This was particularly valued by parents who reported their children were typically avoidant of initiating and responding to conversation. Clara recalled that her young daughter:

"... would tell everybody about it. If family members came over or friends, straight away she'd say, 'guess what I'm doing... guess what I did this week with [the dog]!' She was talking about it all the time."

Some parents reported their young child's engagement with the dog facilitated conversations with peers at school. Jenna shared that her younger son was motivated to share his experiences with the dog with peers at school, despite typically finding social interactions with peers challenging:

"He literally brought in photos. The class thought he was a hero."

Overall, parents valued that engaging with the dogs provided their children with an interest and motivation to engage others in conversation, enhancing their verbal communication use, both in and beyond the sessions, during the treatment block.

Discussion

The qualitative investigation was undertaken to answer the research question: according to the parent perspective, what is the perceived value and contribution of trained dogs in and beyond AAT sessions? The findings provide a rich insight from the parent perspective into the valued contributions of the dogs in facilitating child participation in life activities, both in and beyond the sessions.

The finding that the dogs' calming presence assisted stress and anxiety management reflects studies investigating the stress reducing influence certain dogs have on human arousal. While not related to a clinical-context, Viau et al. (2010) demonstrated that when assistance dogs were placed in the homes of children with ASD, salivary cortisol levels, a biological marker of stress, were observed to significantly decline. Odendaal's (2000) study related to pet-dog ownership similarly found that interacting with pet-dogs produced a cortisol lowering effect. Thus, the parent reported observation that interacting with the dogs promoted child stress and anxiety management supports the findings of previous research.

The dogs' valued role in modulating child stress and anxiety levels in this study may provide insight into the potential therapeutic value of the presence of a dog. Engaging with therapy without interference from heightened stress and anxiety, may enhance the therapeutic utility of interventions designed to specifically support social skill development for children with ASD. Studies investigating the outcomes of combining AAT with an accepted ASD therapy

show that combined therapy produces more positive outcomes (Becker et al., 2017; Grigore & Rusu, 2014). Dogs may therefore facilitate and enhance the therapy process by modulating stress and anxiety, such that children are better able to benefit from therapy.

It has been documented in the literature that raising a child with ASD significantly influences the parenting experience. Managing aggressive and impulsive behaviours and mood disturbances, has been linked to heightened parenting stress (Craig et al., 2016). This is of significance when considering that some parents in this study reported valuing that the dogs supported child stress and anxiety management. For some this related to children displaying comfort attending school, and for others this translated to improved family functioning at home, with fewer child emotional outbursts. Thus, there is some indication that the dogs' contribution to promoting child stress and anxiety management in salient environments beyond the clinic setting, may support parents by modulating child challenging behaviours. While this was a valued outcome during the five-week treatment block, parents reported that this outcome was not maintained to follow up. This raises the question as to the optimal dose-outcome ratio associated with the stress and anxiety outcomes related to AAT with trained dogs.

The second theme related to parents valuing the dogs' presence as promoting child engagement and participation in the sessions. This outcome reflects previous findings that live dogs elicit higher motivation and engagement from children with ASD than the same therapy protocol with a toy dog (Silva et al., 2011). A previous study has also conceptualised dogs as being a source of enrichment in clinic-based therapy activities (Grigore & Rusu, 2014). This enrichment idea relates to the current study, as parents articulated that the value in the dogs' contribution lay in their unique and characteristic traits. The dogs' readily

interpretable cues indicating joy and enthusiasm were conceptualised as a source of child motivation to engage in session activities. Moreover, by de-emphasizing the focus on the child's performance and instead framing activities around the dogs, some parents felt that their children were more inclined to participate without reservation. Thus, the findings from the current study support the notion that dogs may enrich the therapy process.

The Biophilia Hypothesis is relevant to further elucidating the role dogs may play in eliciting engagement and participation in therapy contexts. The Biophilia Hypothesis posits that evolutionary processes have resulted in humans demonstrating an innate interest in animals (Melson & Fine, 2015). It may be the case that the valued heightened child engagement and participation reported by the parents, related to children demonstrating an intrinsic desire to interact with the dogs. This intrinsic interest may also contribute to reported heightened attention and focus, with the dog serving as a focal point. This finding lends support to Melson and Fine's (2015) assertion that the Biophilia Hypothesis provides a strong rationale for including animals in therapy processes.

Considering that supporting the adaptive functioning of children with ASD exists as a source of stress for some parents (Giovagnoli et al., 2015), the finding that certain self-care skills maintained at follow up, is noteworthy. One possible explanation for the maintenance of these gains is the relationship between intrinsic motivation and learning. Human motivation theories suggest that intrinsic motivation (i.e., interest) promotes genuine learning to a greater extent than extrinsically derived rewards (Ryan & Deci, 2000). Thus, an intrinsic motivation to engage with the dogs and session activities, may partially explain the long-term outcomes associated with self-care skills reported in this study. Moreover, relative to social and communication skills, self-care skills are less complex to learn, which may also explain why

only self-care skill gains maintained to follow up. This indicates that a longer intervention period may be necessary to obtain long-term gains in other skill areas.

The third valued outcome reported in the current study is that parents reported that the dogs' presence promoted verbal communication use within the therapy sessions and beyond during the five-week treatment block. Considering that social-communication difficulties are a common characteristic of ASD, this outcome is important. The finding that parents reported that their children engaged in verbal communication in the sessions relates to the outcomes reported in other studies investigating AAI for ASD. For example, Fung (2015) found that when interacting with dogs, a child with ASD demonstrated more social-communication behaviour than at baseline. At follow up, the child continued to demonstrate heightened social-communication use, albeit, to a lesser extent than during the treatment phase. In the current study, parents valued that for communication success, dogs required clear and accurate verbal and non-verbal communication cues. This finding suggests that dogs may serve as highly rewarding stimuli for children with ASD to practice and refine their execution of effective verbal and non-verbal communication.

Parents reported valuing that the dogs motivated child social-communication in; the sessions, while accessing the community with the dog, and in the child's home and school environments. Berry, Borgi, Francia, Alleva, and Cirulli (2013) suggest that the positive emotional response elicited by dogs can be harnessed to promote social interactions and social-communication in children with ASD. The motivation to engage in social-communication demonstrated by the children in this study during the sessions, may suggest that the presence of the dogs served to make the therapist seem more approachable, inspiring child social-communication.

Prothmann and Fine (2011) contend that dogs promote social interactions by serving as a source of common ground between human interaction partners. This is relevant to the finding that the children were more willing to engage in social-communication with others at home and at school, as it suggests that the topic of the dogs served as a source of common interest for the children and their interaction partners. Considering that restricted and repetitive interests are another common symptom of ASD, the fact that children were willing to communicate about a socially acceptable topic is of note. Another important function of dogs for human social integration is their social capital function (Wood, 2011). Interacting with the dog and sharing about their experiences with the dogs, may have provided children with social capital that facilitated their social-communication success in other environments. Thus, the valued social-communication eliciting function reported by the parents in the current study, serves to provide further support for the role played by dogs to facilitate therapeutic interventions for ASD targeting social-communication.

The stress and anxiety management and engagement and participation outcomes reported in this study have implications for practice. Clinicians should consider employing trained dogs as an adjunct to validated therapies to capitalise on the self-regulation benefits seemingly related to including dogs in the treatment context. The parent-reported valued outcomes related to improvements in child adaptive functioning and behaviour at home, indicate that this treatment approach may provide holistic treatment outcomes that benefit not only the child but the family more generally. Furthermore, the reported role of dogs in enhancing the interactions between the therapist and the child with ASD, indicates that for clinical practice dogs may be considered as a mechanism to enhance therapeutic rapport and engagement in goal directed activities with the therapist. Importantly, some children in this study

experienced distress following separation from the dog at the conclusion of the AAT program. With consideration for individual personality and traits, therapists should ensure that the positive outcomes outweigh the potential distress that may result when children finish AAT programs.

Parents were interviewed at various follow up points in this study. Considering that most outcomes associated with the AAT program were not maintained at follow-up, it is possible that the treatment intensity and duration of the AAT program, that is, five and a half hours of therapy across five weeks, was insufficient. Future studies should investigate the optimal dosage of AAT to ensure maximum long-term therapeutic benefits. Parent reports varied in relation to their child's stage of development. As such, future studies should investigate the service-user perspective directly. Interviewing adolescents may be of interest as their stage of development may enable insight regarding AAT programs with trained dogs. Parents and children may differ in their perspectives regarding therapy, therefore, engaging the service-user directly may provide more acuity regarding their perceptions and experience with the program.

This study provides detailed insights regarding AAT with trained dogs, however, there are certain limitations that need to be acknowledged. Overwhelmingly, interviews were conducted with mothers, resulting in an over-representation of the mother-perspective. Moreover, while it was insightful to investigate the parent perspective at three follow up points, interviewing participants several months after the completion of the AAT program may have undermined the accuracy of the parent reports due to recall difficulties.

Additionally, the qualitative nature of this study means findings cannot be generalised to all parents and children with ASD. However, exploring the subjective parent perspective,

provided rich and nuanced insights regarding the AAT program, that may not have been detected by standardised outcome measures (Curtin & Fossey, 2007).

This study presents the insights of a group of Australian parents regarding the value and contribution of trained dogs in an AAT program for children with ASD. The findings indicate that parents value the dogs' contribution in and beyond the AAT sessions in the areas of child stress and anxiety management, engagement and participation and social-communication. While parent reports varied according to each child's unique characteristics, the dogs were overwhelmingly valued by parents as supporting and facilitating the therapy process.

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Manuscript Tables

Table 1

| Table 1: Participant & Child Characteristics | | | | | |
|---|---------------------------|---------------------|--|--------------------------|--|
| Participant(s) | Participant Gender | Child Gender | Child Age at Time of Intervention (years) | Pet Dog Ownership | Time Since Child Completed Program (months) |
| Colin | Male | Male | 8 | ✓ | 3 |
| Clara | Female | Female | 10 | ✓ | 3 |
| Adam | Male | Male | 9 | ✓ | 3 |
| Danielle | Female | Male | 10 | | 6 |
| Amelia | Female | Male | 9 | | 6 |
| Sonja | Female | Male | 8 | | 6 |
| Richard & Jenna* | Male Female | Male | 6 | | 9 |
| Jenna* | Female | Male | 16 | | 6 |
| Erin | Female | Male | 5 | | 9 |
| Sophie | Female | Male | 5 | | 9 |
| Philip | Male | Female | 5 | | 9 |
| Theresa | Female | Male | 8 | ✓ | 9 |
| Helen | Female | Male | 5 | | 9 |
| Evelyn | Female | Male | 15 | ✓ | 9 |
| Adeline | Female | Female | 19 | | 9 |
| Linda | Female | Male | 18 | ✓ | 7 |

*Richard and Jenna are parents of two siblings who completed the AAT program. Interview data was obtained for both siblings.

Table 2

| Table 2: Parent Reported Child Diagnostic Information | | | | |
|--|--------------------------|-------------------------|---|--|
| Participant(s) | Always Non-Verbal | Anxiety Symptoms | Attention Deficit Hyperactivity Symptoms | Sensory Processing Difficulties |
| Colin | | | | |
| Clara | | ✓ | ✓ | ✓ |
| Adam | | ✓ | | |
| Danielle | | ✓ | | ✓ |
| Amelia | | ✓ | | ✓ |
| Sonja | ✓ | | | ✓ |
| Richard & Jenna | | ✓ | | ✓ |
| Jenna | | ✓ | ✓ | ✓ |
| Erin | ✓ | ✓ | | |
| Sophie | | ✓ | | ✓ |
| Philip | | | | |
| Theresa | | ✓ | ✓ | ✓ |
| Helen | | ✓ | ✓ | ✓ |
| Evelyn | | ✓ | ✓ | ✓ |
| Adeline | | ✓ | | |
| Linda | | ✓ | | |

Table 3

| Table 3: Parent Reported Motivation(s) to Enrol Child in AAT Program | | | | | | |
|---|--|---|---------------------------------|---|--|---|
| Participant | To Assist with Anxiety Management | To Improve Social Communication Skills | To Improve Social Skills | To Improve Self-care & Life skills | To Provide Child with a Fun/unique Experience | To Learn about Assistance Dog Role |
| Colin | | | | | ✓ | |
| Clara | ✓ | ✓ | ✓ | | | |
| Adam | | | | | ✓ | |
| Danielle | | ✓ | | ✓ | | |
| Amelia | ✓ | | | | | ✓ |
| Sonja | | | | ✓ | | |
| Richard & Jenna | ✓ | | | | | |
| Jenna | | | | ✓ | | |
| Erin | | | | ✓ | | ✓ |
| Sophie | | ✓ | ✓ | ✓ | | |
| Philip | | | | | | ✓ |
| Theresa | ✓ | | | ✓ | | |
| Helen | | ✓ | | | | |
| Evelyn | ✓ | | | | | |
| Adeline | | | | | | ✓ |
| Linda | | | | | ✓ | ✓ |

Appendices

Appendix 1: Journal of Autism & Developmental Disabilities

Submission Guidelines

Title Page:

- The title page should include:
- The name(s) of the author(s)
- A concise and informative title
- The affiliation(s) and address(es) of the author(s)
- The e-mail address, telephone and fax numbers of the corresponding author

Abstract

- Please provide an abstract of 120 words or less. The abstract should not contain any undefined abbreviations or unspecified references
- Please provide 4 to 6 keywords which can be used for indexing purposes.

Text Formatting

- APA Style
- Text must be double-spaced; APA Publication Manual standards must be followed
- Manuscripts should be submitted in Word.
- Use a normal, plain font (e.g., 12-point Times Roman) for text and 1 inch margins
- 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).
- 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.

Abbreviations

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

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

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.

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.

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.

Appendix 2: Ethics Clearance



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).

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- 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.
- 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

A handwritten signature in black ink, appearing to read 'S. J. Assinder'.

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 3: Data Collection Interview Guide

1. **Can you tell me about your child?**
 - Interests/strengths?
 - Previous exposure to dogs/pet ownership?
2. **Can you tell me a little bit about why you decided to have your child join the program?**
3. **Can you describe any goals that you had for your child while they took part in the program?**
4. **Can you please describe how you felt the program and the dog, helped your child to achieve these goals?**
5. ***If your child has previously been involved in other therapy programs, how did the sessions compare to therapy programs that your child has been involved in before?***
 - Can you please provide some examples?
6. **During the therapy sessions, did you observe anything that surprised you?**
 - Can you provide examples of anything that happened that was **unexpected**?
 - Can you provide examples of anything that happened that you did **expect**?
7. **Can you describe how the dog supported your child;**
 - To interact with others or strangers (for example when buying items at the grocery store)?
 - To pay attention during the session?
 - To feel safe and calm?
8. **Can you describe any ways in which the dog-assisted therapy program assisted your child's skill development?**
 - Spontaneous verbal communication? Non-verbal communication and eye-contact?
 - Gross motor/fine motor skills? (Big and small body movements)
 - How did these therapy outcomes translate to other environments (e.g., home and school)?
 - Do you still observe any of these skill improvements now that several months have passed since your child's last session?
9. **Did you observe any changes in your child after the sessions or between sessions?**

Motivation

 - Did your child tend to talk about the dog/sessions?
 - Was your child excited by the idea of seeing the dog again/attending sessions?

Sensory

- How did your child respond to the smell/feel/sight of the dog? Did this reaction surprise you? Did this reaction change across the sessions?

Transitions refer to how children respond to having to move to different activities or different environments (e.g., moving on from completing a puzzle to a new activity)

- Can you tell me about how your child typically responds to having to move on to different activities or to different environments?
- How did the dog effect your child's response to transitions between environments and activities during the sessions?
- Were there ways in which you felt your child transitioned differently in other environments (e.g., at home or school) while they were involved in the program?

10. Can you describe any other ways in which the dog affected your child during his/her time participating in the program?

- For example; were there ways in which your child behaved differently at home or at school following a session?

11. Would you like to add any comment regarding how the program could be changed or improved?

- Length of sessions?
- Number of sessions provided?

12. Is there anything you would like to add that we haven't touched on today?

Author Note

Kathleen Richardson, Master of Occupational Therapy, Department of Health Sciences, The University of Sydney, Australia. Associate Professor Lynette Mackenzie, Department of Health Sciences, The University of Sydney, Australia. Dr Meryl Lovarini, Department of Health Sciences, The University of Sydney, Australia. Claire Dickson, Assistance Dogs Australia, Sydney Australia.

This research was funded by a research funding grant from S-Centre Group (Westfield). The funding allowed for the five-week AAT program to be delivered by Claire Dickson, Occupational Therapist, at the Assistance Dogs Australia therapy clinic.

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