

Animal Assisted Interventions
for Adolescents with Emotional and Behavioural Problems

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Abstract

The present study used a controlled pre and post-test design to evaluate whether an animal assisted therapy (AAT) program was an effective intervention for adolescents with emotional and behavioural problems. The AAT program used 'Lead the Way', a goal focused dog-training program. Participants were 15 students of an independent school, who had exited mainstream education due to emotional and behavioural problems. Participants were randomly allocated to either the AAT group or the wait list control group. Sixty percent of the AAT group members were male, and ages ranged from 12 to 14 years ($M = 12.80$). All control group members were male, with ages ranging from 14 to 16 years ($M = 14.80$). Quantitative measures of social skills, problem behaviours, self concept, and the resilience factors of mastery, relatedness, and emotional reactivity supported the findings of other studies, and suggest that animal assisted interventions incorporating a dog training model can improve self concept and relatedness to others, and may also improve social skills, self efficacy, and emotional regulation. Qualitative data included behavioural observation (physical and verbal aggression, noncompliance, and withdrawn behaviour) and participant, teacher and facilitator feedback. This indicated a reduction in targeted behaviours, and that the participants of the AAT group benefited from the program. Therefore, AAT may be considered an effective intervention for adolescents with emotional and behavioural problems. These findings are discussed in the context of attachment theory, social cognitive theory, and the biophilia hypothesis.

Statement of Contribution

Project design

The project was designed by the student, with feedback given from the supervisor. Specific aspects of the programs were also discussed with the school, and with the facilitators.

Hypotheses

The hypotheses were developed by the student, with feedback from the supervisor.

Choice of measures

Measures were selected by the student, with feedback from the supervisor.

Data collection

Data were collected solely by the student.

Data analyses

Data were analysed by the student, in consultation with the supervisor and other Monash University staff members, as required.

Preparation of the final report

The report was prepared by the student, with feedback given from the supervisor.

Signed: _____

Naomi Adams

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Emotional and behavioural problems

Emotional and behavioural disorders are often categorised as either externalising or internalising. Internalising behaviours are directed internally toward the individual, and are over controlled. These include anxiety, depression and social withdrawal. In contrast, externalising behaviours are directed outward toward the social environment and are under controlled. Externalising problems include conduct disorder, oppositional defiance disorder, attention deficit disorder, and aggression (Gresham & Kern, 2004).

Animal-assisted interventions have been demonstrated as effective for adolescents experiencing both internalising and externalising disorders and behaviours (RHMSS, 2003). The mechanisms of these effects can be explained in the context of three theoretical perspectives that relate to animal assisted interventions.

*Theoretical perspectives of the human-animal bond
and animal assisted interventions*

Attachment Theory

The human-animal bond is often conceptualised within the framework of human attachment theory. When an animal is used in therapy it can serve as a transitional object of attachment, to support therapeutic goals and, subsequently, improved psychosocial functioning (Kruger & Serpell, 2006). Levinson and Mallon (1997) suggest that children and young people with emotional and social problems who have experienced difficulty in their interpersonal relationships might relate more easily to an animal than to another human being, due to the animal's ability to provide non-threatening, non-judgmental, unconditional attention and affection. Alternate attachment opportunities for children and young people are important, because insecure attachment styles are associated with a wide range of internalising and externalising problems in adolescence (Muris, Meesters & van den Berg, 2003). Related to the concept of attachment in animal-assisted interventions is Weiss's (1974) social provisions theory (Kruger & Serpell, 2006), which purports that interacting with an animal can support

psychological wellbeing and social relationships, via the provision of attachment, social integration, reassurance of worth, reliable alliance, guidance and opportunity for nurturance.

The Biophilia Hypothesis

Put forward by Wilson (1984, cited in Kruger & Serpell, 2006) the biophilia hypothesis purports that humans have an innate tendency toward affiliation with other living beings and nature. Studies claiming to support the biophilia hypothesis have found that interacting with animals and/or nature can produce calming effects and a greater sense of wellbeing (Gullone, 2000; Kahn, 1997). Nature is incorporated into therapeutic interventions in a number of ways, including the use of nature-related stimuli in relaxation strategies, and wilderness therapy programs. Evaluations of wilderness therapy programs have demonstrated improved self-confidence, self-esteem or self-concept, and self-efficacy in adolescents with a range of issues (White & Heerwagen, 1998). Animal assisted therapy is a natural extension or adaptation of this phenomenon.

Social Cognitive Theory

Social cognitive theorists describe a reciprocal relationship between cognitions, behaviour and environment (Bandura, 2001; Kruger & Serpell, 2006). Cognitive constructs include self-efficacy; self-esteem or self-concept; personal agency, or locus of control; social competence; and emotional and behavioural regulation (Bandura, 1991; Bandura, 2001; Kruger & Serpell, 2006). Interventions for children and young people with emotional and behavioural problems often include strategies to enhance the development of social skills (Meadows & Stevens, 2004) and training in emotional and behavioural self control (Polsgrove & Smith, 2004). These skills are often also taught in animal assisted interventions, where animals can play a role in promoting cognitive and behavioural changes in people through the use of observation, modelling and association (Kruger, Trachtenberg & Serpell, 2004), and by shifting attention from stressful stimuli, thereby allowing for exposure to, rather than avoidance of, these stimuli (Brickel, 1982).

Social cognitive theory also identifies the benefits of performance accomplishment, which may be achieved after participating in a goal-focused animal assisted intervention, or by participating in a demonstration of the skills acquired from the intervention. Finally, in

accordance with role theory (which fits within a social cognitive framework), individuals participating in animal assisted interventions involving dog training may demonstrate competence in the role of trainer. This may result in a new positive self-image, leading to associated positive behaviors and generalising to other settings and areas of their lives (Kruger & Serpell, 2006; Siegel, Murdock & Colley, 1997).

Animal assisted interventions with children and young people

Animal assisted interventions encompass both animal assisted therapy (AAT) and animal assisted activities (AAA). The Delta Society defines AAT as a goal-directed intervention with measured progress, where animals are an integral component of treatment, and therapy is directed and/or facilitated by a health or human services professional. On the other hand, AAAs are not specifically focused on treatment goals, but provide opportunities for increased motivation and recreational benefits that may enhance quality of life, through interventions such as animal visiting programs (Kruger & Serpell, 2006).

The first account of animal assisted interventions used with children and young people appears to be the work of psychologist Boris Levinson in the 1960s. Levinson introduced his dog 'Jingles' into his therapy work with children and young people, and noted enhancements to therapy via social facilitation and assistance in establishing rapport, as well as the pet's provision of companionship and unconditional acceptance. Levinson conducted several case studies utilising animal assisted therapy, and found this modality particularly helpful with children with emotional and behavioural difficulties, particularly those who were nonverbal, withdrawn or inhibited, or those with obsessive-compulsive tendencies, or autism (Levinson & Mallon, 1997). Since this early work of Levinson, research on the use of animal-assisted interventions with young people with emotional and behavioural problems has shown numerous benefits, using both AAA and AAT programs.

AAA programs

The presence of a dog in a classroom with students with internalising and externalising disorders has been found to distract students from feelings of anger, de-escalate aggressive behaviour, facilitate social interaction, and support students to regulate their emotions. The

students also demonstrated responsibility, respect and empathy in relation to the dog, which appeared to generalise to their peers (Anderson & Olson, 2006).

Katcher and Wilkins (1998) reported the findings of a study conducted with children with conduct disorder (CD) and attention deficit hyperactivity disorder (ADHD), who participated in either a six-month outdoor bound program, or a six-month companion zoo program. Results at post testing indicated that the companion zoo group demonstrated fewer aggressive episodes and a reduced level of (teacher reported) problem behaviours, compared to the outdoor bound group. These changes also generalised to the regular school program. The authors concluded that AAT demonstrates large therapeutic effects on children with emotional behavioural problems, particularly CD and ADHD. These effects appear to be produced via improved emotional regulation. However, as pointed out by Fawcett and Gullone (2001), this study has methodological problems. These include possible response bias, as the teachers were not blind to the participants' conditions, and the multiple components of the companion zoo program, which makes it difficult to isolate the effective elements.

AAT programs utilising dog training models

Several programs have explored the efficacy of using dog training as an AAT model targeting emotional and behavioural problems in young people. Many dog-training studies have been conducted with incarcerated young people who have retrained shelter dogs for adoption. Activities generally include obedience training, socialising, grooming, walking the dogs, and caring for them. Outcomes of these studies have included qualitative improvements in social skills, including empathy (Harbolt & Ward, 2001); increased emotional and behavioural regulation, reduced aggressive behaviour, improved problem solving skills, social skills, relationships with others, self-esteem and self-efficacy, and the development of empathy (Mathews, cited in RHMSS, 2003); and improved behaviour, social interaction, leadership, and self reported improvements in empathy, nurturing, social skills, self-confidence, and pride of accomplishment (Strimple, 2003).

Dog training models have also demonstrated efficacy with young people who demonstrate behaviour problems but are not involved with the prison system. In case studies of two students in special education, Kogan, Granger, Fitchett, Helmer, and Young (1999) found several

qualitative and quantitative benefits that were observed to generalise from the animal-assisted intervention into their wider school experience. These included verbal and nonverbal communication skills, which led to improved social skills; reduced hyperactive behaviours; improved relationships with peers; improved problem solving skills; decreased feelings of helplessness; and improved sense of control over self and environment. Another case study of two adolescents in special education found reductions in aggressive (verbal and physical) and non-compliant behaviours, which were observed to generalise across settings. These outcomes were not found for a third student, who did not participate in the intervention and whose observation data were used as a control. The authors consider the possibilities that a similar intervention that does not incorporate an animal may also have been effective, and question the role of the facilitator versus the animal (Siegel, Murdock & Colley, 1997).

Studies have also been conducted with larger samples. Granger and Granger (2004) conducted a quasi experimental study incorporating individual and group animal assisted therapy interventions with 31 students aged 12 to 17 years, attending an alternative high school. These students had previously been expelled from mainstream education settings. Sessions focused on dog training, social skills related to caring and nurturing, and self-control. Data from individual and group AAT programs were combined for the purpose of analysis. The AAT group demonstrated greater improvements in social skills, compared to the control group. Qualitative outcomes for the AAT groups included reports of enhanced trust and communication. The authors identified several problems involved with this study, including the small sample size, the non-randomised assignment to groups, and (as data from the AAT groups were combined) the inability to differentiate between the effects of the individual versus the small group intervention.

Marston and Bennett (2007) evaluated the efficacy of two pilot programs conducted as resilience building interventions for 34 mainstream secondary college students, at two different schools. While these programs were not conducted with students diagnosed with emotional and behavioural problems, this study is relevant as it evaluated the dog training model used in the present study ('Lead the Way'), comparing it to a drama-therapy program. In combining results from both schools, no significant differences were found between the programs, in measures of resilience, empathy or self-efficacy. However, both programs resulted in a significant increase in behavioural and social problems, indicating that these behaviours became worse during the

intervention. When results from the two schools were compared, a significant improvement in General Self-Efficacy was found for School 2 but not for School 1. A significant increase in emotional and behavioural problems was found at School 1. Of interest here is that the group size at School 2 was smaller than that at School 1. Therefore it is possible that the interventions improve self efficacy, but only within the parameters of a smaller group. The emotional and behavioral outcomes may be attributed to increased emotional and social awareness from participating in the programs. However, as no control group was utilised in this study, it is impossible to ascertain whether these outcomes are different to those of other students who did not receive an intervention. Further research was recommended, to determine whether the results indicate that the interventions were ineffective in enhancing resiliency, or whether there were problems with the program design. Specifically, it was recommended that further programs include a control group, a greater number of sessions (or sessions of longer duration), control for the effects of the performance, and use both qualitative and quantitative measures (Marston & Bennett, 2007).

In summary, animal assisted interventions have been utilised with a wide range of children and adolescents with emotional and behavioural problems, in a number of different settings. Both AAT and AAA programs have demonstrated efficacy with this target group, in relation to a number of different variables, including social skills, interpersonal skills and relationships with others, self esteem, emotional and behavioural regulation, and self efficacy.

While these results are promising, the majority of studies have been anecdotal, or in the form of hypothesis-generating case studies, rather than hypothesis-testing empirical studies. Researchers in the field argue that qualitative and anecdotal studies may be legitimately presented alongside the more empirical studies, as the findings are consistent with each other (Fawcett & Gullone, 2001; Nimer & Lundahl, 2007). However, further research is clearly required to provide additional scientific support for these interventions. In particular, empirical research is required to test whether the benefits of animal assisted interventions on a small number of individuals can be generalised to larger populations. Further, studies often fail to distinguish between or compare AAT and AAA modalities, making it difficult to determine the effects of the animal's mere presence compared to the effect of the animal as a 'co-therapist', or a living 'tool' in a therapeutic intervention.

The present study aimed to use a controlled research design with established measures, to evaluate whether animal assisted interventions are effective interventions for adolescents with emotional and behavioural problems. Of particular interest was whether AAT group programs (as directed, goal focused programs) are more effective interventions than AAA group programs (as non-directed programs), for this population. The study hypotheses were as follows:

1. Based on social cognitive, attachment and social provisions theories, and previous research (Mathews, cited in RHMSS, 2003; Siegel, Murdock & Colley, 1997) it was predicted that the AAT group would report greater improvements in Self-Concept than the AAA and control groups, and that the AAA group would report greater improvements in Self-Concept than the control group.

2. In line with social cognitive theory and previous research (Marston & Bennett, 2007; Mathews, cited in RHMSS, 2003) it was predicted that the AAT group would report greater increases in Mastery than the AAA and control groups.

3. Based on attachment and social cognitive theories, and previous studies (Kogan, Granger, Fitchett, Helmer & Young, 1999; Levinson, cited in Levinson & Mallon, 1997; Mathews, cited in RHMSS, 2003) it was predicted that the AAT group would report greater increases in Relatedness to others than the AAA and control groups, and that the AAA group would report greater improvements in Relatedness to others than the control group.

4. In line with social cognitive theory, the biophilia hypothesis, and previous research (Katcher & Wilkins, 1998; Kogan, Granger, Fitchett, Helmer & Young, 1999; Mathews, cited in RHMSS, 2003; Siegel, Murdock & Colley, 1997) it was predicted that the AAT group would report greater reductions in Emotional Reactivity compared to the AAA and control groups, and that the AAA group would report greater reductions in Emotional Reactivity than the control group.

5. Based on social cognitive theory and previous studies (Fournier, Geller & Fortney, 2007; Granger & Granger, 2004; Harbolt & Ward, 2001; Kogan, Granger, Fitchett, Helmer & Young, 1999; Mathews, cited in RHMSS, 2003) it was predicted that the AAT group would report greater increases in Social Skills compared to the AAA and control groups. Further, it was expected that other informants would support these findings. Specifically, it was expected that parents and teachers of the AAT group would also report greater increases in positive social

behaviours, as well as greater reductions in problem behaviours, compared to the AAA and control groups.

6. Based on social cognitive theory and the biophilia hypothesis, along with previous studies (Kogan, Granger, Fitchett, Helmer & Young, 1999; Levinson, cited in Levinson & Mallon, 1997; Mathews, cited in RHMSS, 2003; Siegel, Murdock & Colley, 1997) it was predicted that the AAT group would demonstrate greater improvements in negative behaviours (physically aggressive, verbally aggressive, noncompliant and withdrawn) than the AAA group.

Method

Participants

Students

Participants were 15 students of an independent, non-profit, co-educational school that provides individualised educational programs to adolescents who have exited mainstream education facilities due to social and emotional problems. The students are often characterised by lack of confidence and self-esteem, poor academic performance, difficulty in forming relationships with peers and adults, and problematic behaviour. Many are diagnosed with disorders such as conduct disorder, anxiety and depression (Berengarra School, 2007) and several are prescribed medication. It was not possible to control for these factors in this study but it should be noted that two participants diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) reported medication changes during the intervention. One was prescribed medication and the other changed the time of administration. Two other participants were seeing a youth worker, psychologist or counsellor while participating in the program.

Initially, the intended sample was comprised of 30 students, with 10 participants in each group. However due to difficulties in obtaining parental consent and other problems such as non attendance at school, at the time of pre-testing the sample was reduced to 18 students, with each group (animal-assisted therapy (AAT), animal-assisted activity (AAA), wait-list control) comprised of six randomly allocated participants. However, one member from each group dropped out early in the program, leaving each group to commence with only 5 participants. Then, during the project there was a high dropout rate for participants in the AAA program, with

the majority of participants leaving the school before the program was complete. Data from this group were therefore excluded from analysis.

Sixty percent of the AAT group members were male, and ages ranged from 12 to 14 years ($M = 12.80$, $SD = 1.09$). All control group members were male, with ages ranging from 14 to 16 years ($M = 14.80$, $SD = 0.84$). All participants were born in Australia and spoke English at home. Forty percent of the AAT group resided with both parents, compared to 80% of the control group. Other family systems included sole parent homes, parent and step parent, or shared care, where the participant resided in two homes. Sixty percent of the AAT group members had siblings, compared to 80% of the control group members. In relation to pets, 80% of the AAT group members had dogs, and some also had cats or other animals. Sixty percent of control group members had pets including dogs. The AAT group reported participating in between three and five different activities with their pets ($M = 4.20$, $SD = 1.09$). The control group described participating in between two and seven types of activities ($M = 4.30$, $SD = 2.08$).

Informants

Relevant parents or guardians and school staff members were invited to complete a measure in relation to each child's social skills, at two testing times. They were also invited to complete feedback forms following completion of the program. Only two parents chose to complete the forms, however school staff completed measures for each participant.

Materials

Social Skills Rating System (SSRS; Gresham & Elliot, 1990)

The SSRS includes three behaviour-rating measures (teacher, parent, student), available for three developmental levels (preschool, grades K through 6, grades 7 through 12) and assessing three domains (Positive Behaviours (Social Skills), Problem Behaviours, Academic Competence). The present study used the Student Form for grades 7 through 12 and did not collect data on academic competence. This comprised a 39-item Social Skills scale, with subscales for Cooperation, Empathy, Assertion and Self Control. The Teacher Form was also used, comprised of a 30-item Social Skills scale (Subscales: Cooperation, Assertion, Self Control) and a 12-item Problem Behaviours scale, incorporating Externalising and Internalising

problems. The Parent Form was comprised of a 40-item Social Skills scale (Cooperation, Assertion, Responsibility, and Self Control) and the 12-item Problem Behaviours scale. The SSRS uses a three point rating scale, consisting of 0 (the behaviour *Never* occurs), 1 (the behaviour *Sometimes* occurs), and 2 (the behaviour happens *Very Often*). Administration time is 15 to 20 minutes. The Student Version is written for a third grade reading level. As the Social Skills scale reflects positive behaviours, higher scores reflect a greater level of social skills, while higher scores for the Problem Behaviours scale indicate a higher number of these behaviours. The SSRS was based on empirical research and standardised on a sample of 4170 American children in 1988, including those with learning disabilities, behavioural disorders, and intellectual disabilities. Psychometric data including internal consistency, test-retest reliability and convergent validity coefficients are reported in the test manual (Gresham & Elliot, 1990).

Beck Youth Inventories for Children and Adolescents - Second Edition (BYI-II; Beck, Beck, Jolly & Steer, 2005)

The Beck Youth inventories were designed for participants aged 7 to 18 years, and include five self report scales that can be used individually or in combination to assess depression, anxiety, anger, disruptive behaviour and self-concept. The current study utilised one of the five self-report measures (Self-Concept). Items in the Self-Concept scale explore self-beliefs of competence, potency and self worth, including items tapping self-view, body image and relationships with others. Higher scores reflect a more positive self-view. The Self Concept scale has 20 items written at a second grade reading level, and the administration time is 5 to 10 minutes. The Beck Youth Inventories were standardised on a sample of 1000 American children aged 7 to 14 years, and 200 American adolescents aged 15 to 18 years. Additional clinical and special education samples were tested. Psychometric data demonstrating adequate reliability and validity have been published (Beck, Beck, Jolly & Steer, 2005).

Resiliency Scales for Children and Adolescents (Prince-Embury, 2007)

The Resiliency Scales identify core personal qualities of resilience in people aged between 9 and 18 years. They contain three stand-alone self-report measures - Sense of Mastery, Sense of Relatedness, and Emotional Reactivity. Each scale incorporates a number of subscales and is

comprised of 20 items, designed at a third grade reading level. Responses are made on a 5-point scale: 0 (Never), 1 (Rarely), 2 (Sometimes), 3 (Often) and 4 (Almost Always). Higher scores for the Sense of Mastery and Sense of Relatedness scales indicate greater resilience, while higher scores for the Emotional Reactivity scale indicate more vulnerability (to pathological functioning). Administration time is 3 to 5 minutes per scale. The Sense of Mastery scale includes Optimism (about life in general and one's own competence), Self Efficacy, and Adaptability. For developmental reasons, the adaptability subscale is not interpreted separately for children aged 12 to 14 years; however scores for this subscale are included in calculating the total Sense of Mastery score. The Sense of Relatedness scale incorporates the subscales Sense of Trust, Perceived Access to Support, Comfort with Others, and Tolerance of Differences. The Emotional Reactivity scale consists of the subscales Sensitivity (the threshold for reaction), Recovery (ability to recover after a strong emotional reaction), and Impairment (problems in functioning due to emotional arousal). Psychometric testing demonstrating adequate reliability and validity in a standardisation sample from the United States of America, including 500 children aged 9 to 14 years, with clinical cases representing 5% of the sample, is reported in Prince-Embury (2007).

Demographic Form

Student participants completed a demographic form (Appendix A), developed by the researcher, prior to the intervention. Data collected included participants' age, gender, ethnicity, family structure, number and type of pets, and activities undertaken with pets.

Student, Facilitator, Parent and School Staff Feedback

A qualitative and quantitative feedback form (Appendix B) was developed by the researcher to collect information on participants' experience of the programs, as well as parent/guardian and school staff members' observations about the participants, including any noticed changes, and whether or not they felt the program was of benefit. The facilitators also provided general and participant-specific feedback at the end of the program, via feedback forms and interviews.

Behavioural Coding Checklist

The researcher developed a checklist of relevant internalising and externalising behaviours, based on previous studies (Siegel, Murdock & Colley, 1997) and issues typically addressed in animal assisted interventions (Chandler, 2005). The behaviours and their definitions are outlined in Table 1.

Table 1

Internalising and externalising behaviours, and their definitions

Behaviour	Definition
Physically aggressive	Striking or attempting to strike facilitators, peers, dogs or objects, with any part of the body, or with an object. Throwing objects. Pushing or shoving others. Biting others.
Verbally aggressive	Shouting. Swearing. Threatening others. Failing to use a respectful tone of voice when communicating with others. Calling others derogatory names.
Noncompliant	Refusing to follow directions. Refusing to respond. Refusing to participate or cooperate. Failing to stay on task. Negative vocalisations (such as sarcasm, criticism, defeatism, pessimism).
Socially withdrawn	Failing to directly look at/make eye contact with facilitators, peers or dogs. Failing to speak in an appropriate/audible voice. Failing to participate or cooperate. Avoiding interaction/communication with facilitators, peers or dogs.

Video recorder

A video recorder was used to record behaviour for observation, coding, and analysis. Sessions for both the AAT and AAA groups were recorded, although only data for the AAT group were analysed.

Procedure

Ethics approval

Approval to conduct the research was provided by the Monash University Standing Committee on Ethics in Research Involving Humans (SCERH). As the school is a non Government school, and also not part of the Catholic education system, additional ethical approval was not required.

Recruitment

Following a presentation at Berengarra School, students were invited to express interest in the program. Those who responded, their parents or guardians and school staff were provided with detailed explanatory statements and consent forms explaining that participation was voluntary and that withdrawal from the research at any time did not mean that they must also withdraw from participating in the group programs. Both participants and their parents or guardians were required to provide consent.

The programs

The project aimed to evaluate animal assisted therapy and animal assisted activity group programs facilitated by MonashLink Community Health Service, a local service provider for the Berengarra School.

Group programs. Kulic, Horne and Dagley (2004) assert that groups are the best modality to use with children and adolescents given the amount of time spent with peers and their primary socialising influence, the ability for ‘real life’ applications of strategies within the group modality and their high levels of research based efficacy.

Animal Assisted Therapy (AAT) group. The AAT program used 'Lead the Way' (LTW), a goal focused dog-training program. This program was developed by one of the facilitators, a

psychologist and professional dog trainer. LTW incorporates a specific dog training method known as the Lifestyle Canine Communication System (LCCS) (Fontana, 2004) into the therapeutic group process. This method is a reward-based system of training that teaches pattern learning, the use of positive reinforcement such as praise and encouragement and the use of rewards. The program aims to teach specific skills to participants via dog training and therefore takes advantage of the documented benefits of animal assisted interventions. Key skills include the use of tone of voice, praise and encouragement to modify behaviour; understanding rewards, consequences and non-violent limit setting; developing clear communication and interpersonal skills; managing difficult personalities, behaviours or differences of opinion; developing consistency and persistence; planning and cooperating with others; managing frustration and focusing attention; developing empathy and leadership, by helping the dog and fellow group members through new and difficult tasks; developing good interpersonal skills (developing group rules and goals, sharing, problem solving, giving and receiving direction and feedback) (Jones, 2005).

LTW also incorporates therapeutic goals and issues for exploration, drawn from the content of the program sessions themselves, and supported by guidelines for incorporating animals into therapeutic interventions. These guidelines include treatment goals for areas such as bonding, social skill development, self-esteem, empathy and sense of control (Chandler, 2005; Fine, 2006; Kruger, Trachtenberg & Serpell, 2004; Urichuk & Anderson, 2003). LTW utilises two registered therapy dogs that have satisfied stringent obedience and temperament tests. One of the dogs is a five year old male labrador, and the other a two year old female schnauzer/poodle cross. Any practical (for example, occupational health and safety, basic needs of the dog), ethical and legal impacts of using a therapy dog were discussed with the school and satisfactorily addressed. In addition, LTW incorporates a feedback session or performance, in the form of an obedience demonstration, which provides participants with the motivation to achieve their set goals. It is thought that this component may increase the participants' sense of achievement, assist with management of performance anxiety and provide opportunities for participants to be viewed by others in a new and hopefully more positive light. This may lead to a positive feedback cycle that will further enhance participants' self esteem, coping and social skills (Jones & Adams, 2006).

Animal Assisted Activity (AAA) group. A non-directive dog-visiting model was used for the AAA group. This program involved participants exercising, playing with and grooming the same dogs as were used in the AAT group, as well as talking about dogs in general. As visiting programs are typically unstructured, any issues for discussion and exploration were raised by the participants themselves.

Program duration. Research indicates that effective group programs ideally last at least 12 weeks, in order to generate an effect and potentially create long-term change (Hanselman, 2001; Lomonaco, Scheidlinger & Aronson, 2000). There is some indication that the physiological and psychological benefits of animal-assisted interventions may take up to 30 minutes to show significant effects (Barker, Pandurangi & Best, 2003; Barker & Dawson, 1998; Hanselman, 2001; Odendaal, 2000) and that incorporating approximately 20 minutes of animal contact time into sessions may be beneficial (Kogan, Granger, Fitchett, Helmer & Young, 1999). In order to take full advantage of group process, the potentially therapeutic benefits of interacting with animals, and to allow time for students to interact with the dog, each program ran for two class periods (70 minutes), once per week, followed by a recess or lunch break. It was intended for both programs to be facilitated for 13 weeks, over two school terms. However, most of the participants in the AAA group discontinued their enrolment at the school during the first six weeks of the program, leading to its discontinuation at the end of one term. The feedback session was incorporated for the AAT group at week 14, to provide participants with the opportunity to demonstrate their skills and knowledge, and receive reward and recognition from significant others. The control group did not participate in any interventions. They attended their regular classes at the school, and were placed on a waiting list for the AAT group.

Testing – student participants

Participants were tested on a range of variables, at two different times - Time 1 (pre-test, before the start of the intervention) and Time 2 (post-test, after the sessions were completed but prior to the demonstration/feedback session for the AAT group). By conducting post testing before the feedback session, it was anticipated that potential effects of performance-related anxiety might be avoided. Initially a third testing time was planned (follow-up testing, four weeks after the post-testing was completed), to ascertain whether any benefits from the

interventions were sustainable. As the follow up testing was to be completed after the feedback session, it may have captured any impact of public recognition of change and achievement, as well as any negative impact of performance. However, follow up testing was not possible for reasons beyond control of the researcher.

Testing of the student participants was conducted by the researcher in a small group, in a separate classroom within the school. A staff member was available in a nearby room, should participants require support. Prior to commencing testing, each measure was shown to the group and participants were advised how to complete each individual test. The different measures were counterbalanced within testing packets. Participants were advised to read the instructions on the top of each test carefully, to ask questions if they did not understand a word or as question, to answer each question honestly, and to select only one response for each question. With the Beck Youth Inventories, participants were advised, in accordance with the Manual, to especially consider the past 2 weeks.

Testing – parents/guardians/school staff/facilitators

The school posted Social Skills measures and feedback forms to all parents/guardians of student participants, with a brief covering letter and return envelope. The Teacher Version of the SSRS was completed by the same school staff member for each student, at each testing time. This staff member was identified as having knowledge of and a relationship with each participant in the study. This person also completed the teacher feedback forms regarding each participant. The facilitators provided general and participant-specific feedback at the end of the program, via feedback forms and interviews.

Behavioural observation

Behaviour coding of videotapes of sessions 2, 6 and 11 was conducted by the researcher and a second, independent observer who received training in behavioural observation and coding techniques. Participants were observed in order of their code number. Photographs of each participant, taken during the testing periods, were used to ensure that identification was accurate. A checklist was completed for each participant, at the three different times during the 13-week program. A continuous recording method was used to record the frequency of each of the

behaviours, for every participant during each of the three sessions. Interobserver reliability (IOR) was calculated for all observed sessions. For frequency recording, IOR is calculated by dividing the smaller frequency by the larger frequency (Miltenberger, 2008). IOR was calculated for each session, and also for each student. The only variance in observations occurred during the first observed session (session two). Interobserver reliability for sessions 6 and 11 was 100% for all behaviours. With regard to session two, IOR for physical aggression was 100%, and for verbal aggression the mean IOR was 97% (range 85 -100%). For noncompliant behaviour the mean IOR was 91% (range 80 -100%), and for withdrawn behaviour the mean IOR was 97% (range 85 - 100%).

Results

Data were analysed using the Statistical Package for the Social Sciences (SPSS) Version 15, after being checked for accuracy of data entry and missing data. Due to the unexpectedly small sample size ($N = 10$) and the skewed distributions on most variables, nonparametric tests were advised for all analyses (P. Hasking, personal communication, August 22, 2008). Assumptions for non-parametric tests were met. These include random samples and independent observations (with the exception of repeated measures designs). Because nonparametric tests were used, several outliers could be retained. This was deemed appropriate since it was considered that these scores were representative of the sample. In addition, while several variables were skewed, transformations were not made, as nonparametric tests do not require a normal distribution. Given the directional nature of the hypotheses one-tailed tests were selected. An alpha level of .05 was used for all statistical tests.

Between-Groups Analyses - Time 1

Between-groups analyses were conducted at baseline, to identify any differences between the AAT and control group prior to the intervention. Mann Whitney U tests were used to compare ranks for the $n = 5$ AAT group and $n = 5$ control group participants, for each of the dependent variables. With a one tailed test, the critical level for significance is ≤ 4.00 . Effect size for Mann Whitney U tests relates to the proximity of U to zero.

As shown in Table 2, there were significant between-groups differences for two of the variables at baseline. In relation to Self Concept, the AAT group reported a more positive self-view than the control group. The AAT group also reported a significantly greater level of the resilience measure Sense of Mastery, including self-efficacy, optimism and adaptability. The results for Social Skills (teacher form) approached significance, indicating that, while not significantly different, the control group demonstrated a higher level of social skills at baseline than the AAT group. Due to a very low response rate, parent reports for Social Skills were not analysed. No other differences approached significance.

Table 2

Between groups differences in Mann Whitney U rank ordered scores at Time 1

Variable	U	AAT group		Control group	
		Mean rank	Sum of ranks	Mean rank	Sum of ranks
Self Concept	3.50*	3.70	18.50	7.30	36.50
Reactivity	6.50	6.70	33.50	4.30	21.50
Mastery	3.00*	3.60	18.00	7.40	37.00
Relatedness	5.00	4.00	20.00	7.00	35.00
Social Skills (S)	6.00	4.20	21.00	6.80	34.00
Social Skills (T)	4.50	7.10	35.50	3.90	19.50
Problem Behav (T)	10.00	5.00	25.00	6.00	30.00

Note. Social Skills (S) = SSRS Total Social Skills - Student Form; Social Skills (T) = SSRS Total Social Skills – Teacher Form; Problem Behav (T) = SSRS Total Problem Behaviours – Teacher Form; * $p < .05$

Between-Groups Analyses - Time 2

Between-groups analyses were also conducted at post testing to examine whether there were any differences between the groups post intervention. Mann Whitney *U* tests were used to compare ranks for the $n = 5$ AAT group and $n = 5$ control group for each of the dependent variables. Once again, the critical level for significance is ≤ 4.00 , and effect size relates to the proximity of *U* to zero.

As shown in Table 3, a significant between-groups difference was found for only one variable at Time 2. According to teacher reports, the control group demonstrated significantly greater Social Skills than the AAT group. This tendency was also indicated at Time 1. No other differences approached significance.

Table 3

Between groups differences in Mann Whitney U rank ordered scores at Time 2

Variable	U	AAT group		Control group	
		Mean rank	Sum of ranks	Mean rank	Sum of ranks
Self Concept	6.00	4.20	21.00	6.80	34.00
Reactivity	12.00	5.40	27.00	5.60	28.00
Mastery	5.00	4.00	20.00	7.00	35.00
Relatedness	11.50	5.30	26.50	5.70	28.50
Social Skills (S)	9.00	4.80	24.00	6.20	31.00
Social Skills (T)	3.50*	7.30	36.50	3.70	18.50
Problem Behav (T)	9.00	4.80	24.00	6.20	31.00

Note. Social Skills (S) = SSRS Total Social Skills - Student Form; Social Skills (T) = SSRS Total Social Skills – Teacher Form; Problem Behav (T) = SSRS Total Problem Behaviours – Teacher Form; * $p < .05$

Within-Groups (Repeated Measures) Analyses – AAT group and control group

Wilcoxon Signed Ranks tests were used to compare ranks between Time 1 and Time 2 for the $n = 5$ AAT group and the $n = 5$ control group. Given the small sample size, Wilcoxon T values were used rather than z scores. The critical value for significance is 0.00, and effect size for Wilcoxon Signed Ranks tests relates to the proximity of T to zero.

As shown in Table 4, the results for the AAT group revealed significant increases in Self Concept and the resilience measure Sense of Relatedness, between Time 1 and Time 2. These results indicate that the intervention may improve participants' self view, and their sense of relatedness to others. The results between Time 1 and 2 for the control group revealed a significant increase in Emotional Reactivity, but also a significant decrease in teacher reported

Problem Behaviour. There were numerous other within-groups differences between Time 1 and Time 2 for the AAT group that were greater than those observed for the control group, although not statistically significant. The non-significant differences suggest that, with a larger or less heterogeneous sample, AAT may lead to increased social skills and greater resilience in relation to an increased sense of mastery, and decreased emotional reactivity. Conversely, while still not significant, teacher reported Problem Behaviour for the AAT group tended to increase following the intervention.

Table 4

Differences in Wilcoxon rank ordered scores between Time 1 and 2 – AAT and control groups

Variable	<i>T</i>	Negative ranks		Positive ranks	
		Mean rank	Sum of ranks	Mean rank	Sum of ranks
<i>Self Concept</i>					
AAT Group	0.00*	0.00	0.00	3.00	15.00
Control Group	1.50	1.50	1.50	2.83	8.50
<i>Reactivity</i>					
AAT group	3.00	4.00	12.00	1.50	3.00
Control Group	0.00*	0.00	0.00	3.00	15.00
<i>Mastery</i>					
AAT group	1.50	1.50	1.50	3.38	13.50
Control Group	5.00	5.00	5.00	2.50	10.00
<i>Relatedness</i>					
AAT group	0.00*	0.00	0.00	3.00	15.00
Control Group	2.50	2.50	7.50	2.50	2.50
<i>Social Skills (S)</i>					
AAT group	2.50	2.50	2.50	3.13	12.50
Control Group	5.00	2.50	5.00	3.33	10.00
<i>Social Skills (T)</i>					
AAT group	7.00	4.00	8.00	2.33	7.00
Control Group	1.00	1.00	1.00	3.50	14.00

Problem Behav (T)

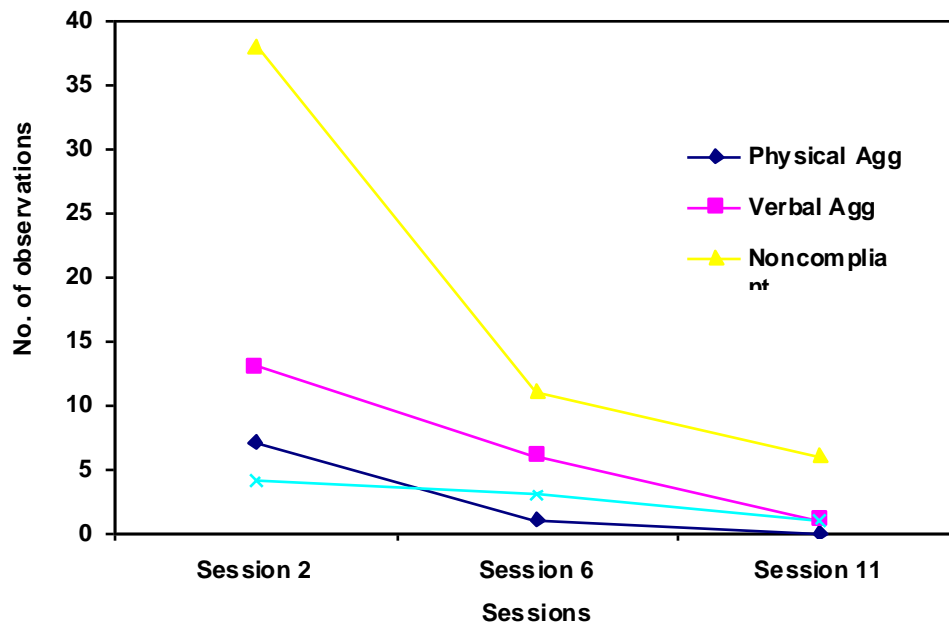
AAT group	1.50	2.83	8.50	1.50	1.50
Control Group	0.00*	2.00	6.00	0.00	0.00

Note. Social Skills (S) = SSRS Total Social Skills - Student Form; Social Skills (T) = SSRS Total Social Skills – Teacher Form; Problem Behav (T) = SSRS Total Problem Behaviours – Teacher Form; * $p < .05$

Observation data

Behavioural observation data (Figure 1) revealed reductions in the frequency of each of five problematic behaviours during the three observed sessions, for the AAT group. Noncompliant behaviours changed most dramatically, from 38 observations at session two, to 11 instances at session six, and six at session 11. Verbally aggressive behaviour also reduced considerably, with 13 instances at session two, six at session six, and one at session 11. Physically aggressive behaviour reduced from seven observations at session two, to one at session six, and then none at session 11. The changes in withdrawn behaviour were more gradual, with four instances at session two, three at session six and one at session 11.

Figure 1. Frequency of observed behaviours by session



Participant feedback

Participant feedback forms indicated that the student participants in the AAT group enjoyed the program (100%), that they would recommend the group to others (100%) and that they perceived that the facilitators cared about and listened to them (100%). They also identified that the group cooperated and supported each other (88%), that participating in the program improved their school attendance (80%), that they learned something new and developed skills (80%) and that it was important to have the opportunity to show what they had learned at a feedback session (88%). The participants also reported noticing changes in themselves since participating in the program (76%), perceived that they understood themselves better (68%) and also others better (76%). Further statements made by two of the participants indicated the positive impact of the facilitators. When asked ‘What did you like most about the group?’ one participant responded “The dogs and Mel and Ange [facilitators] and working with them”. When asked about changes or significant events during the program, and how it affected the participant, another student responded, “I found that people actually care about me and my feelings”.

Facilitator feedback

The facilitators provided qualitative feedback in relation to the effect of the program on participants, and on general improvements that could be made to the program. The facilitator’s perceptions of the benefits of the AAT program are shown in Table 5.

Table 5

Themes and observations from facilitator feedback – effect of the AAT group on participants

Theme	Observations
Bonding/attachment to the dogs	<p>The boys attached more to the large male dog, and the girls more to the small female dog.</p> <p>Participants struggled with termination of the program and the prospect of not seeing the dogs anymore; one participant struggled to conceive that the group could be run with other students.</p> <p>Protective behaviour toward the dogs was evidenced by a participant retaliating against another student (not in the program) who threatened</p>

to hurt one of the dogs. Another student engaged in competitive conflict with other students who were also attached to the dog.

One participant's attachment to the therapy dog appeared to generalise to her dog at home, which she had owned for two years prior to the program. Her attachment to her family dog appeared to increase, and she began training it and wanted to bring it to school.

Self-esteem and self-efficacy

Two students demonstrated strong leadership abilities and all demonstrated an increased awareness of their own strengths, and trust in themselves and their abilities.

Most participants demonstrated persistence at learning the training techniques, leading to increased self-efficacy.

Improvements were particularly obvious during the feedback session.

Interpersonal relationships

Social withdrawal decreased, particularly with one student whose social connectedness to the group improved, despite being teased and excluded by other participants. She sat closer to the group and talked more during sessions.

The group bonded together during the program, and became more supportive of each other.

Cooperation

All five participants shared and worked together with two dogs, helping each other with the obedience commands and preparing for the feedback session.

Empathy

Participants acknowledged the impact of their behaviour on the dogs, particularly the small female dog.

All participants demonstrated care and concern for the dogs.

Empathy was observed to generalise from dogs to peers with one participant, who had been concerned for the dogs' welfare throughout the program, and then began to express concerns about her peers' wellbeing when absent from the group.

Emotion regulation

Participants cuddled or patted the dogs and calmed down, often actively seeking them out to 'self soothe'.

One participant was easily distracted, but his ability to sit still and focus was improved when holding the dogs.

One participant developed strategies to avoid being sent for ‘time out’ and subsequently missing some of the session.

Another participant engaged in tantrum behaviour (swearing, crying, yelling, punching things, hitting and kicking objects) pre-session, which decreased when the dogs were placed near him or when he was near them. At these times he stopped all of the tantrum behaviours but crying. This behaviour never occurred during the sessions.

Participants curbed their aggression in the presence of the dogs.

The ‘Lead the way’ program is only recently developed and this study provided an opportunity to evaluate its efficacy. The facilitators noted two key areas for improvement for the AAT program. First, it was considered that enhancing the therapeutic aspect of the programs could be achieved by emphasising and drawing out the group process issues more consistently, as well as better utilising the reported benefits of animal assisted interventions and linking aspects of the program to skills and issues relevant to the participants. Second, the facilitators identified that working with the students in pairs was very effective, as was using two dogs in the program. They felt that, particularly with this population, working on an individual basis with one, or perhaps with two students would provide the opportunity to incorporate a more therapeutic element to the program. During the current project, less time was focused on the process and application, and more time on containing some of the participants’ behaviours, due to the nature of their issues.

School staff feedback

School staff perceived the programs as beneficial and noted improvements in the AAT program members’ empathy, self-confidence, and relationships with others. They also observed that students appeared to enjoy the programs, and noted an increase in school attendance during the time of the programs, which they directly related to the programs. School staff expressed an interest in running the AAT program again, and reported that they would recommend the project

to other students. They intend to introduce a 'bring your dog to school' day, and also incorporate other animals into the school environment.

Discussion

The purpose of the present study was to use a controlled research design with established measures, to evaluate whether animal assisted interventions are effective for adolescents with emotional and behavioural problems. Of particular interest was whether AAT group programs (as directed, goal focused programs) are more effective interventions than AAA group programs (as non-directed programs), for this population.

In the previous studies that have been empirically evaluated it has been difficult to ascertain what aspects of the programs have been effective - is it the interaction with a therapy animal, or the interaction with an animal combined with a goal directed program? The current study endeavoured to investigate this issue. However due to a high participant dropout rate unrelated to the program (many students left the school), the animal assisted activity group was discontinued. Therefore, it was only possible to compare data for the AAT group to data for the control group.

Based on theoretical assertions and prior studies, several hypotheses were tested. These were tested using between groups differences (comparing the AAT and control groups), along with within groups differences (comparing Time 1 to Time 2, for each group). As non parametric tests were used, any interaction between group and time could not be assessed.

Self Concept

As expected, the results for the AAT group revealed significant increases in Self Concept between Time 1 and Time 2. These results were not observed for the control group. These quantitative results are supported by the qualitative outcomes, including the facilitators' observations relating to increased self-esteem, and school staff observations of improvements in the AAT group members' self-confidence. These results also support previous studies utilising dog training models (Mathews, cited in RHMSS, 2003; Strimple, 2003).

Mastery

It was predicted that the AAT group would report a greater increase in Mastery than the control group. No significant difference in Mastery was found between groups following the intervention or between Time 1 and Time 2 for the AAT group. However, while not significant, there was a trend toward an increase in Mastery between Time 1 and Time 2 for the AAT group. This trend was not observed for the control group. The non-significant differences suggest that, with a larger or less heterogeneous sample, AAT may lead to increased resilience in relation to Sense of Mastery, which incorporates self-efficacy, optimism and adaptability. This trend is supported by the facilitators' observations relating to improvements in participants' self-efficacy. These findings support those of previous studies using dog training models (Marston & Bennett, 2007; Mathews, cited in RHMSS, 2003). However it is important to note that the AAT group reported a significantly greater level of Mastery at Time 1, than the control group. Therefore, changes were based on an existing higher level of self efficacy and competence, which may influence these results.

Relatedness to others

As expected, the results for the AAT group revealed significant increases in Sense of Relatedness between Time 1 and Time 2. These results were not observed for the control group. Consequently, AAT may improve participants' perceptions of their relationships with others, including trust, perceived access to support, comfort with others, and tolerance of differences. These quantitative findings are supported by the facilitators' and school staff members' observations relating to interpersonal relationships and empathy.

These results support the findings of previous studies of both AAA programs (Anderson & Olson, 2006) and AAT programs using dog training models (Kogan, Granger, Fitchett, Helmer & Young, 1999; Mathews, cited in RHMSS, 2003; Strimple, 2003). However, it would have been beneficial to have data for the AAA group in relation to this finding, to determine whether these results were related to the impact of the facilitators, including the dogs, or the structure of the intervention. As the AAT program includes some aspects of social skill development, this finding could reflect skills in this area. However differences in the Social Skills measure were not

significant. It is therefore possible that the presence of the dogs facilitated improved social relationships with others, as per social provisions theory.

Further, the qualitative data in respect to relatedness indicate that the facilitators may have contributed independently to the outcomes. One student expressed that benefits of the program included working with the dogs and the facilitators, while another identified an important outcome of learning that “people cared about me and my feelings”. It may be beneficial for future research to incorporate a control group that utilises (human) facilitators with no dogs, to further examine the role of the facilitator(s) in the outcomes, compared to the animals.

Emotional reactivity

It was predicted that the AAT group would report greater reductions in emotional reactivity compared to the control group. No significant difference was found between groups for this variable, or between Time 1 and Time 2 for the AAT group. However, while not significant, there was a trend toward a decrease in Emotional Reactivity between Time 1 and Time 2 for the AAT group. This trend was not observed for the control group. The non-significant differences suggest that, with a larger or less heterogeneous sample, AAT may lead to increased resilience in relation to reduced emotional reactivity. This trend is supported by the facilitators’ observations of improvements in the regulation of emotion and behaviour. These findings support previous studies of AAA programs (Anderson & Olson, 2006; Katcher & Wilkins, 1998) and AAT programs using dog training (Kogan, Granger, Fitchett, Helmer, & Young, 1999; Mathews, cited in RHSS, 2003; Siegel, Murdock & Colley, 1997; Strimple, 2003).

Of note is that the results between Time 1 and 2 for the control group revealed a significant increase in Emotional Reactivity, but also, conversely, a significant decrease in teacher reported Problem Behaviour. Closer inspection of the data revealed that this difference in emotional reactivity may have been caused by outlier scores from one participant.

Social skills and Problem Behaviours

The prediction that the AAT group would report greater increases in social skills compared to the control group (which would be supported by parent and teacher reports), was not supported by the findings of the present study. According to teacher reports, the control group demonstrated

significantly greater Social Skills at Time 2 than the AAT group. However, it is important to note that the between groups results at Time 1 for Social Skills (teacher form) approached significance, indicating that, while not significantly different, the control group demonstrated a higher level of social skills at baseline than the AAT group.

The results of teacher reports did not support those of student self reports. While not significant, there was a trend toward an increase in self reported Social Skills between Time 1 and Time 2 for the AAT group. This trend was not observed for the control group. Therefore it is possible that, once again, with a larger or less heterogeneous sample, AAT may lead to increased social skills. This is supported by the facilitators' observations relating to cooperation. This trend supports the findings of increased social skills in several previous studies using dog training (Granger & Granger, 2004; Harbolt & Ward, 2001; Kogan, Granger, Fitchett, Helmer, & Young, 1999; Mathews, cited in RHMSS, 2003; Strimple, 2003).

Conversely, while also not significant, teacher reported Problem Behaviour for the AAT group tended to increase following the intervention. Taken together, these findings are particularly interesting, as they reveal inconsistencies between students' perceptions of their own behaviour, and teacher's perceptions of students' behaviour. It is possible that this is due to problems that are common in self report such as social desirability, and/or teacher response bias, as the teacher was not blind to the participants' allocation to groups. Alternatively, the students may perceive that they are acting more assertively (a component of the social skills measure), while teachers perceive this behaviour as problematic.

The lack of significant findings for social skill development in the AAT group may relate to the selection of the social skills measure. Spence (2003) pointed out that the Social Skills Rating System (SSRS) may not be the most appropriate measure for this population, as it is very focused on general aspects of functioning, such as 'produces correct schoolwork', rather than more interpersonal aspects of social skills. This is important, as it is these aspects of social skills that relate to benefits reported in AAT studies. Spence (2003) developed a measure that may have been useful for this population, which focuses on skills and behaviours thought to influence social interactions, including assertive responses, handling conflict situations, and quality of peer and family relationships.

Negative behaviours

It was predicted the AAT group would demonstrate greater reductions in negative behaviours (physically aggressive, verbally aggressive, noncompliant and withdrawn) than the AAA group. Due to the high dropout rate in the AAA group, this group was not continued. Therefore, only observational data from the AAT group were coded and analysed. However, these data supported this prediction, for all four of these indicators of problematic behaviour. These findings were also supported by the facilitators' feedback. These results support those of previous studies, particularly Siegel, Murdock and Colley's (1997) case studies of two adolescents in special education, and Levinson's case studies involving inhibited and withdrawn children (Levinson & Mallon, 1997).

Limitations of the present study

Sample size. With such a small sample, the principles underlying random assignment to groups may not have been effective in the present study. Therefore it is difficult to suggest that these findings may generalise to adolescents with emotional and behavioural problems, as a whole. Subsequently, external validity may be compromised. Further, due to the small sample, non parametric tests were used. Therefore, interactions between group and time could not be formally assessed. A larger sample could enable such direct comparisons. It is anticipated that additional data will be collected in future, to further examine some of these issues. Finally, due to the small sample (and to the directional nature of the hypotheses), one tailed tests were used. As these are less rigorous than two tailed tests, the findings must be interpreted with caution.

Group differences. The AAT and control groups differed in gender composition and age, as well as in scores on the variables Mastery and Self Concept, at Time 1. While previous research indicates no gender difference in the effects of animal assisted interventions (Herzog, 2007), age may be an important factor for consideration, particularly in relation to changes in adolescent development. These differences between groups threaten the study's internal validity. Matching subjects could have controlled these variables but was not possible within the scope of this study.

Multiple components of the interventions. As previously indicated, it was not possible to determine the extent to which the dogs and the facilitators contributed individually to the outcomes of the present study. Although one of the study's purposes was to examine the effects

of animal assisted interventions, further evaluation of the effects of the various components of these interventions is required. For example, future research may consider comparing four different groups - an AAT group; an AAA group; a control group who receives no intervention; and a fourth group, who receives an intervention that can be compared to the AAT and AAA groups but that does not include animals. One example may be a drama-therapy group, as used in the study reported by Marston and Bennett (2007). This limitation was also identified by Siegel, Murdock and Colley (1997) in their study of a dog training intervention with adolescents in special education, and by Fawcett and Gullone (2001), in a review of Katcher and Wilkins (1998) study of the benefits of a companion zoo program for children with conduct disorder and attention deficit hyperactivity disorder.

Other variables. As with the study conducted by Kogan Granger, Fitchett, Helmer and Young (1999) it was not considered feasible or ethical to prevent participants from accessing other services during their participation in the project. Therefore, it was not possible to control for other factors that may have influenced these findings, such as medication and individual counseling.

Future research

In light of the limitations described above, it is recommended that future research ensures a stable alternate group (such as AAA) is included and that a larger sample is utilised. Further, to assess whether the effects of animal assisted interventions are sustainable over time and able to generalise beyond the context of the intervention, studies should include multiple sources of data, and ensure that follow up testing can be completed. This may also capture any effects provided by the feedback session, which gives participants the opportunity to reinforce self efficacy and positive self concept.

It may also be beneficial to incorporate more qualitative data. Observation data may include positive behaviours, such as participation, cooperation, eye contact, positive vocalisations, sharing, following directions and problem solving. Perhaps participants and their parents and school staff could complete more detailed feedback via interview, although given the difficulties with compliance encountered in this study this may not be feasible. With smaller samples, a

multiple case study design may be more appropriate. In the present study, this was also suggested by the facilitators, to enhance the therapeutic aspects of the program.

Given the role of attachment in animal assisted interventions, as well as the relationship between attachment theory and internalising and externalising problems (Muris, Meesters & van den Berg, 2003), future studies may also examine whether adolescent attachment to parents and peers relates to the outcomes of these interventions. Further, Melson (2004) suggests that young people who already have an attachment to a pet may bring to the therapeutic intervention a readiness to attend to and benefit from the animal. Therefore, an exploration of the relationship between the benefits of animal assisted interventions and adolescents' relationships with their own companion animals may also be of interest.

Theoretical implications

Dog-training modalities are potentially a particularly effective intervention with young people with emotional and behaviour problems. These strategies use the inherent benefits of animal assisted interventions, in combination with skill development. The dog-training model has been described in terms of role theory, framed within social cognitive theory. It appears that animal assisted interventions utilising dog training modalities may increase self efficacy, which supports social cognitive theory. Also in support of social cognitive theory, dog training models may improve social skills. These models often incorporate aspects of social skills training, through the use of observation, modelling and association involving animals (Kruger, Trachtenberg & Serpell, 2004).

Animal assisted interventions using dog training may also assist in emotional and behavioural regulation, lending support to social cognitive theory, via the animal's ability to shift attention from stressful stimuli, and their role in the development of emotional regulation strategies. The reduction of arousal levels involved in emotional regulation also supports the biophilia hypothesis, which suggests that interacting with animals and nature produces calming effects (Gullone, 2000).

It appears that animal assisted interventions incorporating dog training improve self concept, which supports social cognitive theory via the cognitive constructs of self esteem, and

also attachment and social provisions theories, via the animal's provision of self worth and positive regard.

Finally, animal assisted interventions using dog training may improve relatedness to others, which offers support to the attachment and social provisions theories. These theories argue that animals can enhance humans' relationships with others. Improved relatedness to others can also be explained by the social cognitive factors of social skill development.

Practical implications

This study has clinical implications regarding working with adolescents with emotional and behavioural problems. Young people with emotional and behavioural disorders experience difficulties in interpersonal relationships and social interactions, prosocial behaviours, and social acceptance (Gresham, Cook, Crews & Kern, 2004). Therefore, establishing interventions that demonstrate efficacy with these populations is essential.

Research, including the present study, indicates that animal assisted interventions, particularly dog training modalities, may be effective interventions for this target group. Providing young people with these problems with opportunities for success and achievements, as well as potentially positive roles to match their strengths may facilitate their feelings of competence and self efficacy. Animal assisted interventions may be particularly important for young people who do not excel in academic, sporting or creative areas.

Further, engaging young people in treatment can be challenging. Interventions targeting young people, particularly those from 'hard to reach' groups, often need to be innovative. The use of a therapy animal may assist in engaging and building rapport with these clients, and with retaining this target group in therapy.

Conclusion

Unfortunately, methodological issues prevent strong conclusions from being drawn from the results of the present study. Preliminary data suggest, however, that it may be beneficial to incorporate AAT programs into the curriculum of alternative education schools. It appears that animal assisted interventions, principally those incorporating a dog training model, may demonstrate particular improvements in the areas of self concept and relatedness to others.

However, trends from the current data also indicate benefits to social skills, self efficacy, and emotional regulation. While the limitations in the current study require caution in interpretation due to the small sample size, these findings support those of previous studies, and indicate that AAT may be considered an effective intervention for adolescents with emotional and behavioural problems.

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Appendix A
Demographic Form

Demographic Questionnaire

ID Number: _____

What is your age (in years)? _____

What is your gender? Male Female

Were you born in Australia? Yes No

If no, how long have you lived in Australia? _____ Years _____ Months

Are you Aboriginal or Torres Strait Islander? Yes No

Do you speak English at home? Yes No

If no, what language do you speak? _____

Who lives in your home? (Tick all that apply)

Mum Dad Brother/s Sister/s Grandparent/s

Other/s _____

Do you have any animals/pets at home? Yes No

If no, have you ever owned animals? Yes No

If yes, what sort? (Tick all that apply)

Dog Cat Other

If you have animals/pets, what activities do you do with them?

Walking Bathing/grooming Playing Training

Caring for Petting/patting

Appendix B
Feedback Forms

**Animal Assisted Interventions – Student Specific Feedback Questionnaire
(Facilitator/School Staff Form)**

Participant's Name: _____

Please circle the response that best matches your opinion about the program

This student appeared to enjoy the program

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

This student seemed to learn something new by participating in the program

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

Participating in the program increased this student's school attendance

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

I have noticed changes in this student since participating in the program

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

If so, please tick any of the boxes that apply to these changes, and describe:

- Assertiveness
- Empathy
- Self control
- Responsibility
- Self efficacy
- Relationships with others

- Optimism
- Self confidence
- Cooperation
- Communication skills
- Coping with / reacting to emotions
- Behaviour problems / 'acting out'
- Social withdrawal / 'shyness'
- Anxiety
- Depression
- Self esteem

(Add additional pages if required)

For the next questions, tick yes or no. If you tick yes, please explain why

To your knowledge, did anything important happen to this student, or change in their life, during the terms that he/she participated in the program?

Yes No

If yes, what happened? How did it appear to affect this student?

To your knowledge, did this student start taking new medication, or change anything with any existing medication, while participating in the program?

Yes No Unsure

If yes, what was the medication for?

How did he/she change their medication? Tick the box that best describes

Start taking it Stop taking it
Change the dosage Change the type Unsure

To your knowledge, did this student start seeing a youth worker/counsellor/psychologist while participating in the program?

Yes No Unsure

If this student was already seeing a youth worker/counsellor/psychologist, did this change while he/she was participating in the program?

Yes No Unsure

If yes, please describe how it changed.

Is there anything else that you would like to add regarding this student's participation in the program?

THANK-YOU! 😊

**Animal Assisted Interventions – General Feedback Questionnaire
(Facilitator/School Staff Form)**

Overall, what were the positive aspects of the dog training program?

And the dog visiting program?

Is there anything that could be done to improve the dog training program?

And the dog visiting program?

THANK-YOU! 😊

Animal Assisted Interventions – Feedback Questionnaire (Parent Form)

Participant’s Name: _____

Please circle the response that best matches your opinion about the program

My child appeared to enjoy the program

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Disagree	Strongly Agree

My child seemed to learn something new by participating in the program

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Disagree	Strongly Agree

Participating in the program increased my child’s attendance at school

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Disagree	Strongly Agree

I have noticed changes in my child since participating in the program

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Disagree	Strongly Agree

If so, please tick any of the boxes that apply to these changes, and describe the changes

- Assertiveness
- Empathy (understanding others’ feelings)
- Self control
- Responsibility
- Self efficacy (belief in own abilities)
- Relationships with others
- Optimism
- Self confidence
- Cooperation

- Communication skills
- Coping with / reacting to emotions
- Behaviour problems / 'acting out'
- Social withdrawal / 'shyness'
- Anxiety
- Depression
- Self esteem

For the next questions, tick yes or no. If you tick yes, please explain why

Did anything important happen to your child, or change in their life, during the terms that he/she participated in the program?

Yes No

If yes, what happened? How did it affect your child?

Did your child start taking new medication, or change anything with any existing medication, while participating in the program?

Yes No

If yes, what was the medication for?

How did he/she change their medication? Tick the box that best describes

Start taking it Stop taking it

Change the dosage Change the type

Did your child start seeing a youth worker/counsellor/psychologist while participating in the program?

Yes

No

If your child was already seeing a youth worker/counsellor/psychologist, did this change while he/she was participating in the group?

Yes

No

If yes, please describe how it changed.

THANK-YOU! 😊

Animal Assisted Interventions – Participant Feedback Questionnaire

ID Number: _____

Please circle the response that best matches how you felt about the group

I enjoyed coming to the group

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

I would recommend the group to others

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

I learned something new by coming to the group

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

I understand myself better since coming to the group

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

I understand other people better since coming to the group

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

I have noticed changes in myself since coming to the group

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

The workers cared about me and listened to me

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

The group co-operated and supported each other

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

Having a feedback session made me more likely to want to participate in the group

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

The group made me more likely to want to come to school

1	2	3	4	5
Strongly disagree	Disagree	Unsure	Agree	Strongly Agree

For the next questions, tick yes or no. If you tick yes, please explain why

Did anything important happen to you, or change in your life, during the terms that you participated in the group?

Yes

No

If yes, what happened? How did it make you feel?

Did you start taking new medication, or change anything with any existing medication, while you were participating in the group?

Yes

No

If yes, what was the medication for?

How did you change your medication? Tick the box that best describes

Start taking it

Stop taking it

Change the dosage

Change the type

Did you start seeing a youth worker/counsellor/psychologist while you were participating in the group?

Yes

No

If you were already seeing a youth worker/counsellor/psychologist, did this change while you were participating in the group?

Yes

No

If yes, please describe how it changed.

What did you like the most about the group?

Is there anything that could be done to improve the group?

THANK-YOU! 😊