INCORPORATING SHELTER DOGS INTO AN ANIMAL ASSISTED THERAPY
PROGRAM:
A ONE WELFARE APPROACH

By

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ABSTRACT

      The qualifications to become a therapy animal do not specify the breed or background of the dog participant, so any dog can become a therapy dog if they possess the right attributes. If a valid and reliable tool can be used to find appropriate dogs for use in therapy from a shelter setting, many dogs can fill an important role in society while awaiting adoption and experience a novel form of enrichment. For this research, the interest in involving shelter dogs in AAT was identified utilizing a survey. After this, a test battery was developed in order to select shelter dogs appropriate for a simulated AAT session.

      In order to assess preferences in terms of the type of dog used in AAT, whether that be a trained therapy animal or a shelter dog, a survey was administered to assess the respondent's trauma background, interest in AAT, and any stigmas associated with shelter dogs. It was hypothesized that individuals with a trauma history would be more likely to express interest in working with shelter dogs in AAT, due to increased empathy and prosocial behavior (Hoffman, 2008). All respondents reported a desire to work with a shelter dog in animal-assisted therapy, regardless of trauma history. For the test battery, it was hypothesized that dogs that displayed low levels of impulsivity, high levels of social cognition, frequent help seeking behaviors, high levels of empathy, and high levels of resilience would be best suited for a simulated group animal-assisted therapy scenario. There was little significant correlation between the test battery and performance during the simulated animal-assisted therapy scenario. Despite this, all human participants found simulated AAT enjoyable, and based on HAIS scores, the majority of dog participants, almost 90%, had positive experiences as well.

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TABLE OF CONTENTS

INTRODUCTION

The human-animal bond (HAB), described as a mutually beneficial relationship between people and other animals (Wollrab, 1998, p. 1675), has been purported to have numerous health benefits for both the animals and people involved. For example, decreased heart rate and blood pressure have been reported in human participants following HAI (Anderson et al. 1984; Baun, 1984; Friedmann, 1979; Friedmann et al. 2000; Podberscek et al. 2000; Robinson, 1995; Siegel, 1990; Vormbrock & Grossberg, 1988), with similar findings for dogs (Beetz et al. 2012; Gantt et al. 1966; MacLean et al. 2017; MacLean et al. 2018; O'Haire et al. 2019). HAB also has beneficial effects on mental health outcomes for people, including decreased loneliness and increased social connections (Budge et al.1998; Sable, 1995; Zasloff & Kidd, 1994). The HAB can also mitigate symptoms of Post-Traumatic Stress Disorder (PTSD) (O'Haire et al. 2019). PTSD may develop in people who have experienced trauma, which results in recurring symptoms such as flashbacks or nightmares, avoidance, memory loss, and hyperarousal (O'Haire et al. 2019; Tedeschi et al. 2015). Hyperarousal in particular may improve since the presence of an animal can encourage feelings of safety (O'Haire et al. 2019).

Animal-assisted therapy (AAT) is defined as the use of animals in existing trauma treatment (administered by a licensed health care professional) in order to encourage participation (Lefkowitz et al. 2005; Mims & Waddell, 2018). The presence of animals can be particularly beneficial in a therapy setting due to the complex effects of interpersonal trauma, examples of which include sexual assault, serious illness of a loved one, physical assault or violence. Interpersonal trauma is more complicated to treat in a therapy setting than a faceless disaster (such as war, natural or manmade disasters) since interpersonal trauma can result in the persistent distrust of others, which impacts interactions with the mental healthcare provider

(O'Haire et al. 2019; Tedeschi et al. 2015). Animals can function as a secure confidant, and clients may feel safer engaging in interactions and entering into relationships with the animals than they would with other human beings (Tedeschi et al. 2015). In addition, people with animals are often perceived as friendlier, happier, less threatening, and more approachable (Eddy, Hart, & Boltz, 1988; Friedmann & Lockwood, 1991; Lockwood, 1983; McNicholas & Collis, 2000; Wells, 2004).2015). The presence of an animal during therapy may enhance the therapeutic relationship by providing a positive impetus for connection and rapport between the client and mental healthcare professional (O'Haire et al. 2019).

While there are well-documented benefits of AAT, there are instances when AAT can be quite strenuous for animal participants. Carvalho et al. (2020) reported that some participant dogs displayed greater degrees of stress when placed into circumstances that involved longer travel times, high temperatures, and extensive interaction with children. To ensure the welfare of the canine participants, it is best to limit these stressful situations as much as possible (Carvalho et al. 2020). It is only in recent years that research has evaluated the health and welfare impacts of AAT for animal participants (Coppola et al. 2006; Kuhne et al. 2014; MacLean et al. 2017; Normando et al. 2009; Ogi et al. 2020). One Welfare is a term to describe the shared well-being of humans, animals and the environment (Pinillos et al. 2016). The One Welfare construct is especially pertinent in evaluating how AAT impacts both the humans and animals involved.

It has been shown that there is a correlation between trauma history and empathy expression (Hoffman, 2008; Lim & DeSteno, 2016; Vollhardt & Staub, 2011; DeSteno, 2015; Goetz et al., 2010). Empathy is the ability to recognize another's thoughts and feelings, and to respond to these with an appropriate emotion (Greenberg et al. 2018). Thus, it may be reasonable to hypothesize that people who have experienced trauma may want to engage in a One Welfare

approach to AAT, which is intended to also be beneficial for the animal participant. Furthermore, empathy is correlated with prosocial behaviors (i.e. any activity done with the intent to help another) (Lim & DeSteno, 2016; Greenberg, 2018). Research by Birkett & Sasaki (2018) has revealed that engaging in prosocial activities can lead to an increase in oxytocin, which increases the likelihood of future prosocial behaviors. This oxytocin response is also seen in prosocial activities between humans and dogs (Birkett & Sasaki, 2018).The relationship between increased empathy secondary to trauma and the subsequent likelihood of engaging in prosocial behaviors spurred development of this thesis to evaluate motivations and preferences related to AAT partnerships.

The first research project evaluates whether the relationship between trauma, empathy, and prosocial behavior may drive people to have the desire to work with a dog from a disenfranchised background. The second part of this research tried to determine if shelter dogs suitable for and comfortable in an AAT environment could be identified. If the hypothesis for the first part of the research is correct, that people with a trauma history want to engage in AAT with shelter dogs, then there needs to be a valid and reliable tool to select shelter dogs for this AAT. Therefore, the goals of the second part of the research was intended to develop a tool for screening shelter dogs who would be comfortable with and capable of working with trauma survivors in an AAT setting.

CHAPTER 1: LITERATURE REVIEW

Introduction

AAT has been increasingly implemented in the past decade, especially work with dogs (Carvalho, 2020; Fine and Becky, 2010; Fine and Weaver, 2018). Currently, there are not well-established guidelines for selection of dogs well suited for AAT. Working dog organizations may utilize behavioral assessments to select the best dogs for their associated work, such as such as Guide Dogs for the Blind and Military Working Dogs (Duffy & Serpell, 2012; Frakin et al. 2013; Fratkin et al. 2015; Riemer et al. 2014; Serpell & Hsu, 2001; Serpell & Hsu, 2006; Tomkins et al. 2011). Behavioral assessments, such as the Meet Your Match (MYM) and Safety Assessment for Evaluating Rehoming (SAFER) assessments, are used in shelters to in attempts to find successful matches for rehoming (Bennett et al. 2012; Bennett et al. 2015; Curb et al. 2013).

Behavioral assessment are typically a conglomeration of several different tests intended to identify specific aspects of temperament, which are deemed stable and predictive of future behavior, but based on responses during one moment in time (Clay et al. 2020; Dowling-Guyer et al. 2011; Patronek & Bradley, 2016; Patronek & Bradley, 2019; Poulsen et al. 2010). The strength of behavioral assessments comes from their construct validity, that is, the ability for these tests to discern the traits they are trying to identify (Haverbeke et al. 2015; Patronek & Bradley, 2016; Patronek & Bradley, 2019). However, several papers have questions the validity and predictive values of temperament testing protocols.

To be meaningful and predictive of future performance, all behavioral assessments must have high construct validity and reliability, be feasible in terms of time and effort (Jones & Gosling, 2005; Patronek & Bradley, 2016; Patronek & Bradley, 2019). If a behavioral assessment could be developed that can assess dogs adulty dogs at one time interval, this may be

a feasible behavioral assessment for shelter organizations to utilize to select dogs for work as therapy animals. There are currently no behavioral assessments designed to evaluate shelter dogs for AAT work.

Overview of Behavioral Assessments

Canine behavioral assessments employ a variety of strategies, such as direct observation under various conditions, performing tasks to elicit responses, employing an object in order to observe how the dog interacts with it, among others. One of the goals of a behavioral assessment is to describe behavioral aspects or temperament of the dog, to aid in rehoming or purposeful work (e.g., AAT, service dogs). Temperament can be described as individual behavioral differences observed when testing animals, with these differences being present from an early age and relatively stable over time (Diederich & Giffroy, 2006; Goodloe & Borchelt, 1998).

Patronek & Bradley (2016) suggest that it is impossible to attain high sensitivity (results that accurately identify the presence of a behavior) and specificity (results that correctly indicate the behavior of interest was not elicited) in behavioral assessments for several reasons. If the dog is deemed too dangerous, most often it is euthanized and removed from the population of dogs to test (Patronek & Bradley, 2016; Marder et al. 2013). This means that there is little variation due to selection bias, with most dogs being relatively nonaggressive. A lack of variation in the pool means that there will be a high rate of false positive results, indicating the assessment has diminished sensitivity. Thus, far too many dogs in the population would be incorrectly labelled as exhibiting high levels of unwanted or aggressive behavior, when in fact they could be passable. Lack of variation in the pool was also addressed as a limitation in Fratkin et al. (2015), and others (Hennessey et al. 2001; Taylor & Mills, 2006). On the other hand, if an assessment is unable to elicit the appropriate response, for example aggression, then that means potentially

dangerous dogs could pass the assessment. Patronek & Bradley (2016) state that in order to ensure sensitivity and specificity of a test, they must be compared to a reference point, or a "gold standard."

A gold standard can only be achieved if a behavioral assessment has been validated, and the test itself must be reliable. Validity refers to how the measure relates to what you want to study (Diederich & Giffroy, 2006). Reliability is the measure of internal consistency, or how each item being studied correlates with one another. Taylor & Mills (2006) state that in order to achieve reliability, the consistency of results must be stable across tests, subtests, and observers. In a sense, a test cannot be considered valid if it is not also considered to be reliable as well. In the context of behavioral assessments, the consistency of measures between individuals is especially important since many different individuals in many different circumstances will utilize the same behavioral assessment. Behavioral assessments rely on the hopes that the behaviors elicited in the assessment are indicative of future behavior, no matter the experimenter nor the dog participant.

Instead of relying on behavioral assessments, the authors recommend observing dogs in normal, everyday situations to make note of behavior in a 'natural' context in attempt to capture the dog "on its best behavior" as stated by Patronek & Bradley (2019). The authors argue that artificial behavioral assessments can give an inaccurate and narrow view into the dog's life. In a shelter setting, this might present a more challenging task, as it is not a "normal" environment. To expand upon traditional shelter assessments, Willen et al. (2019) and Haverbeke et al. (2015) suggest looking at shelter dog behavior on a more "global" level, from the time the dog enters the shelter to the behavioral assessment to post-adoption. Understanding the dog's behavior at all of these unique time points would help to gather a better understanding of the dog as a whole.

Additionally, they recommend that the end goal of the behavioral assessment still needs to be addressed while administering the assessment. The predictability of the test should be what is driving the subtests.

Although behavioral assessments have been met with skepticism in the past few years, they are still a necessary part of working dog selection and the shelter adoption process. Finding the right role or home for a dog ensures the ultimate welfare of the dog and protects the human-animal relationship. Additionally, it would be a waste of resources, or a potential liability, if a dog is placed in a program for which he/she is not suitable, or a home where he/she could be at risk of biting. The goal of this literature review is to examine the topic of canine behavioral assessments, identify their weaknesses, and generate new ideas for moving forward.

Test Batteries

Test batteries are the most common form of behavioral assessment (Jones & Gosling, 2005; Taylor & Mills, 2006; Dowling-Guyer et al. 2011). These tests are marked by presenting a series of novel stimuli or prescribed situations and recording reactions of the dog and are deemed to be relatively objective in nature (Jones & Gosling, 2005; Dowling-Guyer et al. 2011; Wilsson & Sinn, 2012). Subtests are hallmarks of the test battery, and they usually contain many similar elements featured in the SAFER assessment, such as; a "look" component where the experimenter looks into the dog's eyes (Bennet et al. 2012; Bennet et al. 2015), a "touch" component where the experimenter holds, pets, or grasps various parts of the dog's body and their reaction is assessed (Bennet et al. 2012; Bennet et al. 2015; Valsecchi et al. 2011), a "food guarding" component where the experimenter presents the dog with food and attempts to take the food away (usually using a fake hand) (Bennet et al. 2012; Bennet et al. 2015; Valsecchi et al. 2011), an "object guarding" component where the experimenter presents the dog with an object

(usually a toy) and attempts to take it away similar to the food guarding component (Bennet et al. 2012; Bennet et al. 2015), and an "intra-specific aggression" component where the dog is introduced to a test dog in order to gage how the dog in question responds to other dogs (Bollen & Horowtiz, 2008; Dalla Villa et al., 2017; De Mester et al. 2007; Bennet et al. 2012, Bennet et al. 2015). Also, commonly seen are components that specifically measure how the dog reacts to novel and startling stimuli (Valsecchi et al. 2011), a "kennel behavior" component (Valsecchi et al. 2011) and components that assess how the dog responds to various commands (Valsecchi et al. 2011). Test batteries can be considered a form of behavioral rating. In behavioral ratings, behaviors are observed in a test scenario and an overall rating is calculated (Wilsson & Sinn, 2012). Many studies use test batteries or other forms of behavioral ratings to determine the temperament of shelter dogs for rehoming purposes (Dowling-Guyer et al. 2011; Dufour et al. 2005; Hennessey et al. 2001; Mornement et al., 2010; Scarlett et al. 2007; Valsecchi et al. 2011; Walker et al. 2016), to assess potential 'problem' behaviors (Haverbeke et al. 2009; Netto and Planta, 1997; Haug, 2008; King & Coleman, 2003; Borchelt, 1983, Perez-Guisado et al. 2006; Haug, 2008; Netto & Planta, 1997; Bollen & Horowitz, 2008; Dalla Villa et al. 2017; De Mester et al. 2007, Scarlett & Houpt, 2007; Bennett et al. 2015; King & Coleman, 2003; Barrera et al. 2010; Goddard & Beilahrz, 1984; Gruen et al. 2015; Dalla Villa et al. 2017; De Mester et al. 2007; Tiira et al. 2015; King et al. 2003) or to determine if dogs are suitable for guide dog work (Tomkins et al. 2011; Serguson et al. 2005; Fratkin et al. 2015; Lucidi et al. 2005). Most often, ratings rely on Likert-style scales to quantify behavior (Wilsson & Sinn, 2012), or an ethogram to make note of all behaviors presented (Dufour et al. 2005).

Aggression

An example of a test battery commonly used in shelters to predict future home behavior is the SAFER test (Bennet et al. 2012; Bennet et al. 2015). In this assessment, dogs are exposed to various novel and potentially startling stimuli in order to provoke fearful or aggressive responses (Bennet et al. 2012; Bennet et al. 2015). Undesired aggression can be a problem for both the dog and the people involved. It has been reported to be the most important public health issue around dog ownership (Dalla Villa et al. 2017). Being able to predict which dogs are more at risk of injurious behavior such as biting, is important to avoid inadvertently selecting dangerous dogs for inappropriate homes or roles. Since this is a major area of concern for many shelters and selection programs, it is also likely why so many developing behavioral assessments have focused on aggression (Haverbeke et al. 2009; Netto and Planta, 1997; Haug, 2008; King & Coleman, 2003; Borchelt, 1983, Perez-Guisado et al. 2006; Haug, 2008; Bollen & Horowitz, 2008; Dalla Villa et al. 2017; De Mester et al. 2007). However, in some cases, controlled aggression is needed for certain jobs such as Military Working Dogs (MWDs), and these tests may therefore have an additional purpose (Haverbeke et al. 2009).

Many of the tests meant to assess the potential for aggression are also highly stressful for the animal. When stressed, a dog may behave unnaturally and could exhibit more aggressive or fear-related responses (Bennett et al. 2015). Further, many of the situations used in test batteries that attempt to elicit problematic behaviors are so unique that it is unlikely that the dog will ever experience such a situation again. It calls into question whether experimenters should actually make predictions about future behaviors based on these unique and highly provocative experiences. It is also important to maintain safety of the experimenter and the dog when attempting to elicit aggression in a behavioral assessment, so many test batteries use a leash for

9

this reason (Bollen & Horowtiz, 2008; Dalla Villa et al. 2017; De Mester et al. 2007; Valsecchi et al. 2011). Assessing aggression on the leash becomes tricky because dogs may act differently while on the leash as opposed to off leash (Haug, 2008). A leash may limit the dog's movements, which may cause stress (Haug, 2008). Also, the owner's grip on the leash may cause tension that would otherwise not be there, and over time the dog may associate unpleasant experiences with being on the leash (Haug, 2008). This can all lead to undesired aggression presenting itself while the dog is leashed, whereas the dog acts appropriately off-leash (Haug, 2008). A test dog is also often used in order to assess inter-specific aggression (Bollen & Horowtiz, 2008; Dalla Villa et al. 2017; De Mester et al. 2007; Valsecchi et al. 2011; Bennett et al. 2012; Bennett et al. 2015). This dog is chosen for its calm demeanor for safety reasons as well, but this aspect cannot be controlled for outside of the testing situation, sine the dog may come into contact with all types of dogs that may elicit different reactions or to different degrees. Sometimes only one test dog is used, so it is hard to speculate how a dog will react to a dog different in size, color, or reproductive status (Scarlett & Houpt, 2007; Bennett et al. 2015; Diederich & Giffroy, 2006). For the same reasons, a dog in the testing environment may react differently to the human experimenters involved. Aggression is extremely complex and there are many factors at play, which makes the results of behavioral testing somewhat inconclusive.

Scarlett et al. (2007) proposed a theory that dogs who have passed a temperament test and have been screened for aggression may display other forms of aggression in the new home that are not being tested through a behavioral assessment. Such aspects of aggression include territorial aggression, predatory aggression, and aggression towards the owner (Scarlett et al. 2007; Bollen & Horrowitz, 2008) as the majority of the assessments developed seem to provoke fear-related aggression. These former types of aggression are particularly hard to test for,

especially owner-directed aggression and territorial aggression, since neither the dog-owner relationship nor the permanent environment of the dog are fully established when behavioral assessments take place in a shelter environment. Child-directed aggression is also an issue that is hard to predict in a behavioral assessment, since it is difficult to replicate the movements and sounds of children using a doll (Bollen & Horrowitz, 2008). Additionally, behavioral assessments may fail to elicit an aggressive response due to the state of the dog during testing (Taylor & Mills, 2006; Bennett et al. 2015). A dog may be too stressed to display aggression, so it becomes crucial that behavior and responses are monitored closely in order to determine how and why a dog is behaving the way it is during a behavioral assessment (Taylor & Mills, 2006).

Retesting and Habituation

When it comes to addressing the reliability of test batteries, studies often rely on retesting shortly after the initial assessment (Mornement et al. 2014; Netto & Planta, 1997; Valsecchi et al. 2011; Stephen & Ledger, 2007). Retesting can determine if the assessment is a reliable predictor of behavior at different time points. However, the concern with retesting is with potential habituation; dogs or experimenters may produce bias results because of familiarity with the test as a whole or the specific objects or scenarios within the test (Patronek & Bradley, 2019; Taylor & Mills, 2006, Mornement et al. 2014; Netto & Planta, 1997; Taylor & Mills, 2006) and thus, result in inaccuracy. When it comes to test batteries, however, there are few options for assessing reliability outside of retesting. Unfortunately, studies with time constraints may not be able to wait long enough for habituation to be a nonissue, as in the study by Mornement et al. (2014) where the second test was done only 24 hours after the first test. Real-life time constraints in shelters may hinder the ability of researchers to wait long enough for habituation effects to wane.

11

If there is an optimal time for retesting, researchers must also account for the feasibility of the wait time.

Age

The timing of behavioral assessments is also pertinent in regards to the age of the dog when the testing takes place. Taylor & Mills (2006) express that the age at which temperament is stable is still debatable, and therefore, challenges the long-term capability of behavioral assessments to predict future behavior. Additional research is needed on the range of ages appropriate for a behavioral assessment, and in turn, how long the predictability of the test may remain valid (Fratkin et al. 2015). To add to the issue, there is virtually no discussion about what age is considered 'too old' for testing, aside from two comprehensive studies by Chopik & Weaver (2019) and Chapagain and colleagues (2018). Both mention the fact that cognitive changes occur in older dogs (the age at which these changes occur being very individual-specific), which can affect how they perform on cognitive tasks. A similar issue may be at hand for many of the geriatric population of shelter dogs undergoing behavioral assessments for rehoming purposes.

Certainly, there are benefits to testing at a young age for some assessments. For example, assessing puppies for their suitability as working dogs may be preferable since time and resources can be saved. Some studies have shown that puppy testing is fairly predictive of behavior later in life, and certain predictions made through puppy testing can lead to predicting better performance on working dog selection criteria (Asher et al. 2013, Slabbert and Odendaal, 1999, Svobodova et al., 2008, Asher et al., 2013, Fratkin et al., 2013; Duffy and Serpell, 2012). For example, a test battery conducted at seven weeks and was found to be 72% predictive of passing the police dog certification (Svobodová et al., 2008). Similar results reported by Slabbert and Odendaal (1999), demonstrate that the tests used were predictive of performance on later

aptitude tests. However, the results of a puppy test at eight weeks of age compared to the same test conducted in adult dogs showed that the early test was not predictive of behavior later in life (Wilsson & Sundgren, 1998). Many behaviors exhibited by adult dogs are not present at eight weeks of age, and neural development continues on throughout adolescence, so behavioral testing may have low predictive value when conducted before 12 weeks (Wilsson & Sundgren, 1998). According to Goddard and Beilharz (1986) and Beaudet et al. (1994), testing around three months of age is associated with greater predictability of results in behavioral assessments. However, behavior during the juvenile period of dogs, which usually begins at around three months of age (depending on breed), is poorly studied according to Harvey et al. (2016) and Diederich & Giffroy (2006), and most of what is known about behavioral development applies to the first 8-12 weeks of life in dogs. Batt and colleagues (2008) suggest that 14 months of age is feasible for temperament testing of working dogs, since dogs that are in working dog programs have not completed training by this age, and the fact that the dogs have hit many developmental milestones would help with predictability. However, it is unlikely that testing at this age would be adopted, since a considerable amount time and resources would have been invested by the time a potential working dog is 14 months of age.

Svobodová et al. (2008) speculate that discrepancies in the puppy testing literature occur because of differences in methodology and a lack of consensus about various aspects of testing, especially those aspects that relate to aggression. Given the conflicting recommendations in the current literature, and lack of variability in age ranges considered, the effect of age during behavioral assessments is a vastly understudied area. The results of an expanded suite of studies in this area would be a welcome and important consideration for working dog programs that are

interested in saving resources and for shelters where dogs of all ages are relinquished and in need of assessment.

Observer Reports

Many researchers turn to the use of observer reports to screen for certain traits before testing (Haverbeke et al. 2009; L. van den Berg, 2003), to assess whether or not questionnaires are valid predictors of behaviors (L. van den Berg, 2003), to compare the results from the questionnaire to the results of the experimental results (Jakovcevic et al. 2012), or to screen for persistence of certain behaviors in the new home (Stephen & Ledger, 2007; Hennessy et al. 2001, Wells et al. 2000; Borg et al. 1991). Observer reports are the most common subjective rating method in the literature. Subjective ratings attempt to define behaviors based upon the observer's perception of the dog's behavior, and an overall temperamental characteristic is given (confident, shy, bold, for example) (Wilsson & Sinn, 2012). In Wilsson & Sinn (2012), behavioral assessments were compared to observer reports in a working dog population undergoing training. Both the observer reports and behavioral assessments strongly correlated with each other. Results showed few differences between them in terms of classifying dogs that did or did not complete training, which indicates a lack of false positives and false negatives. Despite the fact that the descriptions used in working dog assessments are rather subjective, they tend to be more reliable than shelter/pet dog assessments since they are typically very specific according to Taylor & Mills (2006). Although anecdotal evidence from observers can provide valuable information that can be reliable, it is still important to subject these interpretations to objective analysis (Clay et al. 2020a). Keeping a test objective, and therefore less prone to change, will ensure that the test is repeatable.

Bias

The reliance on an observer's assessment of dog behavior could be a source of error due to the opinions of the individuals about the behavior of the dog (Valsecchi et al. 2011). In regard to reliability and validity of observer reports, a study by Stephen & Ledger (2007) assessed whether or not relinquishing owners of shelter dogs were good at describing their dog's behavior, and if their description was correlated to behavior later on. Reliability was highest for predictions of fear with unfamiliar people, anxiety when left alone, entering the veterinarian's office, stealing food, and aggression when at the veterinary office. Eight of the twenty scores recorded by relinquishing owners correlated significantly with ratings by the new owner two weeks post-adoption. Only six, however, correlated with the new owners' accounts six weeks post-adoption.

Discrepancies between relinquishing owner reports and the reports of new owners are not uncommon. The causes for discrepancies may be environmental (i.e. the dog is not used to the new home and may act differently), or the new owner and dog may have a different relationship than the previous owner, or the two owners may view and report behavior in different ways. It could also be that the relinquishing owners' reports did not have very high predictability, or the predictability of the reports only last for so long. However, this warrants further study. Serguson and colleagues (2005) evaluated a behavioral questionnaire given to two groups of respondents relinquishing their dog to a shelter. One group was told that their answers to the questionnaire would be confidential, the other group was not. The results were also compared to results obtained from questionnaires filled out by owners who were not relinquishing their dogs. Results showed that aggression towards owners and members of the family was much more prevalent in the confidential information group than the nonconfidential group, as was stranger-

directed fear. The confidential group also showed higher prevalence of reports of owner-directed aggression, stranger-directed fear, aggression or fear towards dogs, and separation-related behaviors compared to the group who was not relinquishing their dogs. Perhaps owners who knew that their information would be confidential were more willing to disclose certain behavioral problems, compared to owners who were worried that behavior problems would make it more difficult for their dog to find a new home. The motivation behind the decision to relinquish will certainly influence the results of an owner report, which brings a level of bias to observer reports.

In an attempt to avoid bias, Valsecchi and colleagues (2011) utilized shelter veterinarians who had received behavior training to create behavior profiles. Validation in this study was achieved through comparisons with external criterion, or an outside benchmark (Valsecchi et al. 2011). In this case, a behavioral profile made by shelter veterinarians who had received behavior training was used as the benchmark. The profile was based on the dogs' previous histories, and after the behavioral assessment, the results were compared to the profiles created by the veterinarians. The behavioral assessment was successful in showing that dogs deemed fearful, friendly, or aggressive by the shelter veterinarians based on past history showed fearful, friendly, or aggressive behavior in the behavioral assessment. Using trained, experienced, or objective professionals is not always possible, and many behavioral assessments may need to rely on the ratings of novices. However, if novices can be trained to recognize behaviors accurately, this may be a feasible way to ensure reliability and validity of behavioral profiles.

If novices are adequate in their assessments, this would prove beneficial since judgments about the dog can be made without the need for an expert, who may not be easily available. In Fratkin et al. (2015), expert ratings of dogs (given by a professional in the field of assessing

dogs, who had 22 years of experience) were compared to ratings given by novices (psychology undergraduate), in order to determine the reliability and validity of novice ratings of behavior. This study provided some evidence that novices can be reliable sources, however the novices needed to undergo training before their ratings could be deemed acceptable. Additional training adds additional time to the process, the main concern driving the recommendation to use novices over professionals with busy work schedules.

Describing a behavior based on its underlying mechanisms is the best way to ensure objectivity. A novice and an expert alike will know what tail wagging looks like, but a novice may not know that tail wagging doesn't always indicate a positive affective state. The solution to this issue could be the use of simple behavioral descriptions, which identify behaviors in a discrete, component-by-component fashion. The Canine Behavioral Assessment & Research Questionnaire (C-BARQ) is a good example of a questionnaire that follows this descriptive structure (Serpell & Hsu, 2001). The C-BARQ is the most widely used and validated questionnaire for assessing dogs (Serpell & Hsu, 2001). It includes the use of descriptors of behaviors (such as ear position, facial tension, and posture), instead of general behavior terms (such as "fearfull" or "aggressive") in attempt to reduce misunderstandings in reporting. Additionally, the C-BARQ identifies a wide range of behaviors and states, such as stranger-directed fear/aggression, non-social fear, energy level, owner-directed aggression, chasing, trainability, attachment, and dog-directed fear/aggression (Serpell & Hsu, 2001). The original purpose of this questionnaire was to use it on young dogs for guide dog selection, therefore interpretation of the assessment to other dog populations that are different in terms of age, for example, may be limited. However, because of the ease of use of the assessment and its high construct validity, several researchers have implemented the C-BARQ in other dog populations

and have seen similar behavioral components being identified as in the original study (Barnard et al. 2012; Bennett et al. 2012; Dalla Villa et al. 2017; Duffy et al. 2008; Duffy & Serpell 2012; Foyer et al. 2014; Fratkin et al. 2013; Harvey et al. 2016; Jacovcevic et al. 2012; Kobayashi et al. 2012; Miller et al. 2010; Scarlett et al. 2007; Serguson et al. 2005). Therefore, the C-BARQ may be the best available choice in terms of subjective ratings of behavior that we have in the literature as of now.

Behavioral assessments are still necessary and provide very good information about a dog, especially in certain circumstances (such as a shelter scenario) where information about a dog's history may be unavailable (Clay et al. 2020b). However, as stated by Patronek & Bradley (2016), relying solely on a behavioral assessment to make conclusions about the future of the dog would not be in the dog's best interest. The main goal of behavioral assessments in the shelter scenario is to predict behavior post-adoption, so it would make the most sense that the home would be where an assessment of predictability is made. Many authors have made this connection, (Stephen & Ledger, 2007; Hennessy et al. 2001, Wells et al. 2000; Borg et al. 1991) but a hinderance to achieving predictability for a behavioral assessment comes from a lack of validation in terms of the at-home report. It is therefore critical to link behavior at the time of relinquishment, to the behavioral assessment, and to behavior post-adoption in order to get an accurate view of a dog's behavior (Haverbeke et al. 2015, Willen et al. (2019). As Clay and colleagues (2020) emphasize, behavioral assessments are still a work in progress. Attempting to describe the behavior of an animal will always be a difficult task, however utilizing both physiological measurements, as well as behavioral indicators at various time points in the animal's life, will help to give us an idea about what they're experiencing.

The Way Forward

Successful Dog-owner Matches

A secondary goal of behavioral assessments is to create successful dog-owner relationships, regardless of whether the dogs are being assessed by a guide dog organization, or at a shelter. Patronek & Bradley (2016) and several others have called attention to the lack of measurable outcomes reported when assessing validity of behavioral assessments (Jones & Gosling 2005; Batt et al. 2008; Sinn et al. 2010; Wilsson & Sinn 2012; Harvey et al. 2016; Clay et al. 2020a). For shelter dogs, a decreased return rate is a desirable outcome. A decrease in return rates indicates an increase in successful dog-owner matches. One way to help facilitate successful dog-owner matches could be through mechanisms similar to the Match-Up questionnaire and behavioral assessment (Dowling-Guyer et al. 2011, Bennett et al. 2012, Bennett et al. 2015). This assessment entails a test battery as well as a questionnaire portion for the potential adopters to fill out in order to understand what aspects of a dog's behavior are desirable, and which aspects are not. After dogs complete the test battery, matches can be made between attributes that a dog possesses and an owner who seeks out those traits. Therefore, an appropriate match between owner and dog can be made, and thus return rates are likely to be diminished. This assessment was successful in determining three commonly tested aspects of dog behavior, such as fearfulness, friendliness, and aggression. These three aspects of behavior are very important when considering if a dog is a good match for a potential owner, but other aspects of behavior that were not identified by the assessment, but are still important to potential adopters, were not identified by the test battery. For example, the behavioral component of trainability, or how quickly the dog can pick up commands, was not investigated in this behavioral assessment, but this component of behavior is important to potential adopters

(Dowling-Guyer et al. 2011). Therefore, more research into which aspects of a dog's behavior are important to adopters, and a subsequent test battery that can be used to identify all of these characteristics, should be investigated further.

Behavior Modification Programs

In order to improve upon behavioral assessments, post-adoption behavior should be closely monitored as well. In van der Borg et al. (1991), a test battery designed to assess four problem related behaviors (aggression, fear, obedience, and separation anxiety) was compared to the opinions of shelter staff about the behavior of a dog, as well as owner reports taken from those that adopted the dogs after testing. The results from the owner reports showed that 65 people cited 190 potential problem behaviors, but only 43 of them thought that the behavior of the dog was an issue. Although a main goal of behavioral assessments for shelters is to rehome safe dogs, a potential problem behavior is very different from one that is already a problem.

If the goal of shelter assessments is to determine the behavior of the dog for rehoming purposes, then a dog that fails could potentially be given more time to habituate to the stressful environment or enter a training or desensitization program. In a study by Willen and colleagues (2019), dogs were given a SAFER assessment in order to gauge the dogs' fearfulness levels. The dogs were then split up into equal groups of fearful and nonfearful dogs that would either receive a treatment option of 30 minutes of human contact a day for five days, or no treatment (control). After this period of treatment or no treatment, dogs were then reevaluated using the SAFER in order to see if the treatment had any effect on the outcomes. More fearful dogs passed the SAFER assessment after they received additional human interaction, whereas fearful dogs who did not receive additional human contact did not improve their success rates. Not every establishment will be able to implement such interventions due to space constraints or the need

for extra staff or staff time to care for and work with these dogs. However, if shelters are able to hold on to dogs that do not pass a behavioral assessment for longer, and then re-assess the dogs in the future after a brief period of intervention (such as through volunteer work with dog walking, or volunteer play time), modification of behavior may be possible.

The Use of Physiological Data

A topic that needs further research is whether there should be implementation of physiological markers to validate behavioral assessments. Cortisol is considered the most important glucocorticoid hormone to assess by some (de Carvalho et al. 2019; Hewson et al. 2007), and it makes sense to assess cortisol levels in order to assess the arousal of the animal (Coppola et al. 2006). It has been shown that there is a direct link between behavioral displays of stress in dogs and cortisol measures (a higher cortisol measure indicating a greater stress response) (Hennessey et al. 2001, Coppola et al. 2006, Bennett et al. 2015). Many studies have monitored hypothalamic-pituitary-adrenal activity (HPA), such as cortisol/creatine ratios (Gruen et al. (2015); Walker et al. (2016); Hennessey et al. (2001); Rooney et al. (2007; Dufour et al. 2005), to assess stress. However, cortisol can be affected by the time of day that samples were taken, as well as the dog's activity level (Hennessey et al. 2001). Although HPA measures are not perfect, they provide a general idea of the dog's level of arousal. Behavioral indicators can then provide the needed context to explain the level of arousal. More research needs to go into finding the best physiological indicator for stress and arousal in dogs. Until then, it is best to incorporate multiple indicators of arousal in order to disentangle the emotional state of the dog during testing.

Feasibility

The development of a behavioral assessment is not a final step in the process of predicting dog behavior. Researchers must keep in mind those who will be conducting these assessments, such as shelter staff. In regard to the feasibility of assessments, Mornement and colleagues (2019) surveyed shelter staff about perceived ease of use, accuracy and relevance of the instrument. Although poor participation rates hindered their ability to draw meaningful conclusions from the survey, this approach is a step in the right direction. Feedback is always important when developing a program. If researchers can get information from shelter staff about the outcomes of the behavioral assessments, then significant improvements can be made in order to make the tests more predictive and valid.

Conclusion

Behavioral assessments may be shelter staffs' best available option for getting a better picture about a dog's behavior, particularly when there is little or no background available on a dog. Behavioral assessments are also a necessary tool for working dog organizations. They save time, materials, and money by selecting dogs with greater potential to be successful at the youngest age possible. The overall goal of these tests is to put a dog in a situation that will evoke a response, which will in turn serve as an indicator of future behavior in a similar scenario. The dilemma arises when these behavioral assessments are not predictive of future behavior, subtests are too provocative (leading to false positive responses), or when the situations they simulate are not reflective of real-world situations. By utilizing behavioral modification programs, physiological measurements, and behavior post-adoption, as well as accounting for the feasibility of the assessment, behavioral assessments may be able to be improved in the future. Additionally, the steps that need to be taken in order to achieve predictable results in behavioral

assessments must be feasible enough so that everyone can use them in practice. That way,

behavioral assessments identifying working dogs could be utilized in more establishments, and

thus more dogs could be screened and identified for use in applicable roles, such as service dogs,

therapy dogs, MWDs, and more.

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CHAPTER 2: TRAUMA SURVEY

Introduction

Most people will experience some sort of trauma at some point in their lives (O'Haire et al., 2019; Kessler et al., 2017; Breslau et al., 1998;). Trauma can come from a variety of sources, including, but not limited to war, auto accidents, violence, sexual assault, serious illness, and natural or manmade disasters (O'Haire et al. 2019; Tedeschi et al. 2015). It has been shown that experiencing trauma relates to expressing a higher degree of empathy (Hoffman, 2008; Lim &DeSteno, 2016; Vollhardt & Staub, 2011; DeSteno, 2015; Goetz et al., 2010). Empathy is the ability to recognize another's thoughts and feelings, and to respond to these with an appropriate emotion (Greenberg et al. 2018). The severity of the trauma that an individual has experienced also influences empathy and subsequent behaviors related to empathy, such as compassion and prosocial behaviors. Increasing severity of past adversity leads individuals to become more compassionate, according to a 2016 research study by Lim & DeSteno. Compassion can be described as the expression of empathy, that is, how an individual acts upon the empathy they feel (Lim & DeSteno, 2016; Greenberg, 2018).

Research by Birkett & Sasaki (2018) has revealed that engaging in prosocial activities, that is any activity done with the intent to help another, initiates t hethe release of oxytocin. Oxytocin continues to be released as the activity continues, thus stimulating a positive feedback loop. This positive feedback loop is even seen in prosocial activities amongst non-human animals (Birkett & Sasaki, 2018). With this in mind, it may be reasonable to assume that people that have experienced trauma may want to engage in AAT with a shelter dog in particular, given that they would feel a desire to help the animal they are engaged with. It was this relationship between prosocial behavior and trauma that stimulated interest in surveying the population about

trauma history, opinions of shelter dogs, and dog preferences. The aims of this research project were to assess if a person's trauma history was related to preferences about working with shelter dogs during AAT.

Materials & Methods

The questionnaire was distributed via social media utilizing a banner advertisement on the MSU Companion Animal Behavior and Welfare Group Facebook page (https://www.facebook.com/MSUCABWG/). The survey had a total of 106 respondents. Only survey responses with full trauma history data were used in the analysis, since assumptions about blank trauma histories or partially filled out trauma histories were not considered appropriate. Of the 106 total responses, only 39 were complete.

Question Development

The Life Events Checklist (Gray et al. 2004) was utilized to identify trauma history, including specific types of trauma (e.g., accident, natural disaster, unwanted sexual contact), whether the trauma was directly experienced by the individual vs vicarious trauma, and age at which trauma was experienced. These questions were scored either as a binary (such as if the trauma was directly experienced by the individual vs vicarious trauma, and whether the respondent experienced that specific type of trauma) or as a multiple-choice option, such as age at which trauma was experienced (range from less than 11 years old, between 12 and 17 years old, and 18 years of age or older). Binary questions related to specific types of traumas were then tallied and added together in a sum score of the total number of different traumas the respondent has experienced in their lifetime. Questions related to preferences and beliefs related to types of dogs and AAT were based upon the PAAWS-D survey (Mornement et al 2012), as well as from a third-party focus group facilitated by a program evaluator following completion of AAT

34

programming. The Likert-style questions presented respondents with various statements related to working with shelter dogs and certified therapy animals. Each Likert-styleEach Likert-styleRespondents had to choose whether or not they aggreed with each statement from a choice of responses (i.e. on a scale of 'strongly disagree,' disagree,' 'neither agree nor disagree,' 'agree,' and 'strongly agree'). Each question attempted to reflect various ideas related to thoughts and feelings specifically about shelter dogs, therapy dogs, or thoughts and feelings related to AAT in general.

Most questions developed related to shelter dogs specifically. The research question that is implied with each of these related questions is whether or not people are inclined (or discouraged) from working in an AAT environment with a shelter dog because they have a positive (or negative) view of shelter dogs. Several questions relate to hesitancy to work with shelter dogs because of stigmas (behavior issues/mistreatment) associated with them or fear of them. People may be discouraged from working in an AAT environment with a shelter dog because they have negative views of shelter dogs. People who believe that shelter dogs may have behavior problems / have experienced mistreatment may not be comfortable working with these dogs. Alternatively, people may be inclined to work in an AAT environment with a shelter dog because they feel like it could be a positive experience for the dog and therefore a learning opportunity to improve behavior. Respondents may believe that dogs could benefit from simply interacting with a person. People may think that AAT will help dogs gain experience working with people in a positive way, or that dogs may simply enjoy the attention and affection provided by people in an AAT setting. People may be inclined to work in an AAT environment because they see that the change in environment could be beneficial to a shelter dog or certified therapy animal. People may believe that shelter dogs spend too much time in their kennels, and therefore

would want to help them by providing them with out-of-kennel enrichment. People may also believe that certified therapy animals would benefit from a change in scenery and opportunity to engage in a new activity.

Related to this, the question 'I would feel like they had done a good deed' attempts to define the prosocial component of trauma. People may describe that they feel like helping or interacting with a shelter dog because it makes them feel like they had done something positive. In that same vein, 'People would think of me in a positive way for working with a shelter dog' relates to a 'people-pleasing' mindset. Many peoples' motivations are tied to how society views them (Baumeister & Hutton, 1987). People could be inclined to work in an AAT environment with a shelter dog because they are motivated by the benefits of being seen as a good Samaritan.

The question related to shared trauma ('We would both benefit due to shared trauma') also attempts to define the prosocial behavior that is higher amongst people who have experienced trauma. People may feel like they can connect on a deeper level with a dog that had experienced trauma or may project their feelings and attitudes towards their trauma onto the shelter dog. Additionally, dog participating in an activity like AAT would set him/her apart from the general dog population, and therefore people may believe that this will be an added "plus" to put on the dogs' bio, and thus make them stand out to potential adopters. People may have a general idea of what AAT looks like, where a dog is calmly sitting beside the handler and client, ready and willing to accept affection from the client. From this general idea, a person may assume that a shelter dog that participated in this activity must display a calm and friendly demeanor, which are very desirable traits in a pet. People may also find it to be an interesting talking point to bring up when introducing their dog to others. Not everyone can say that their

dog has participated in AAT, and therefore the potential new owner may feel a sense of pride in their animal.

The question related to liking dogs ('Respondent likes dogs') can be used to describe a specific a reason why someone would want to participate in AAT. That is, if they derive comfort from dogs. If people are comforted (or made uncomfortable) by working with an animal, this may be the reason why they would want to participate in AAT. People who want to work with dogs in AAT and like dogs will relate strongly with this question. 'It would be a new experience' can relate to people who are high in openness to experience. People may be inclined (or discouraged) from working in an AAT environment because they like (or dislike) to try new things. Many people most likely have not had experience with AAT, and if they like dogs, it would be an enjoyable new experience for them. This can also relate to those individuals who have experience working with shelter animals or certified therapy animals, and therefore would want to try AAT since working with these types of animals is familiar and would like to try it again.

Table 1: Likert-Style Questions, Reasons Why Respondents are Motivated to Participate in AAT.

I would feel (comfortable / uncomfortable) working with a (therapy /shelter) dog
I like (therapy /shelter) dogs
Hesitancy to work with a (therapy /shelter) dog
Shelter dogs have behavior problems
The interaction would improve the shelter dog's behavior
Shelter dogs have often been mistreated

Table 1 (cont'd)

The interaction would help shelter dogs that have been mistreated
The (therapy /shelter) dog would benefit from the interaction
The (therapy /shelter) dog would benefit from the new environment
I would feel like I did something good
People would think of me in a positive way for working with a shelter dog
We would both benefit due to shared trauma
Make the dog more adoptable
It would be a new experience for me
It would be enjoyable to me

Analysis

Due to the categorical nature of the data, that is, each question was rated on a scale based on their category of agreement, an ordinal regression type of analysis was deemed most appropriate. The natural log of each variable in comparison to each independent variable for each research question revealed a linear relationship. In addition, no significant outliers were observed in each variable, nor was there any multicollinearity in the set. Likewise, each variable in analysis proved to be independent of other variables in analysis. The proc logistic function in SAS (SAS, 9.2, Cary, NC) was used to determine the odds ratio estimate in order to determine a relationship between the amount of traumas the respondents has experienced, and how they answered the Likert-style questions.

Results

Descriptive Statistics

Almost all respondents indicated that they would like to work with a dog in AAT, as outlined in Table 2, and there was no preference for working with a shelter or trained therapy dog. More than half of respondents strongly agreed that they liked shelter dogs (21/39), and about half of those surveyed strongly disagreed with statements that indicated hesitation (19/39) or discomfort (18/39) related to working with shelter dogs. Similarly, approximately half of those surveyed indicated that they would find AAT with a shelter dog to be a comforting (19/38) and enjoyable (17/39) experience, despite the fact that few respondents had previous experience working with shelter dogs (12/39). In addition, almost half of respondents felt like others would think of them highly for working with a shelter dog (15/39), and to a varied degree, respondents strongly agreed with statements that participating in AAT with a shelter dog would make them feel like they had done a good deed (21/39).

When asked if participating in AAT would make a dog more adoptable, most respondents indicated that they strongly agreed with this statement (29/39). Most respondents indicated that they thought dogs would benefit from the interaction (25/39), and that AAT would benefit the dog because it would offer time outside of the kennel (29/39). Finally, a little over half of respondents strongly agreed that the AAT experience might help the dog regain trust in humans again if the dogs had experienced mistreatment before (19/39). More than half of the respondents strongly disagreed with the statement that shelter dogs have behavior problems (21/39), and participants were uncertain if shelter dogs have experienced mistreatment (22/39). Approximately one-third of respondents were unsure if AAT would help the dog's behavior (14/39) or if the experience would be beneficial from a shared trauma perspective (14/39).

Table 2: *Descriptive Statistics. Tally of how many participants answered each possible option for each Likert-style question related to shelter dogs.*

Parameter	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
Make the dog more adoptable	0	1	1	8	**29**
Shelter dogs have behavior problems	**21**	14	4	0	0
It would be comforting for me	0	1	5	13	**19**
It would be enjoyable to me	0	1	5	**17**	16
I would feel like I did something good	0	0	5	13	**21**
I am hesitant to work with a shelter dog	**19**	10	6	2	1
The dog would benefit from the socialization	0	0	2	12	**25**
The interaction would improve the dog's behavior	0	7	**14**	10	0
The dog would benefit from time out of its kennel	0	0	2	8	**29**
I like shelter dogs	0	0	7	11	**21**
Shelter dogs have often been mistreated	3	1	**22**	15	0
The interaction would help dogs that have been mistreated	0	0	2	18	**19**
It would be a new experience for me	6	12	4	11	6

Table 2 (cont'd)

I would feel uncomfortable working with a shelter dog	**18**	**11**	6	1	1
People would think of me in a positive way for working with a shelter dog	0	1	14	**15**	8
We would both benefit due to shared trauma	1	2	**14**	12	9

Looking to Table 3, the majority of participants expressed that they liked therapy dogs (24/39), and almost half of the respondents strongly disagreed with the statement related to being uncomfortable working with a therapy dog (18/39). More than half indicated they would be comforted by (21/39) and/or enjoy the experience (22/39) of AAT with a therapy dog. Most also strongly agreed with statements indicating that AAT would benefit the therapy dog in terms of interaction (25/39) and that therapy dogs would benefit from the new setting of AAT (20/39).

Table 3: Descriptive statistics. Tally of how many participants answered each possible option for each Likert-style question related to trained therapy dogs.

Parameter	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
The dog would benefit from the interaction	0	0	2	11	25
It would be a comforting experience for me	0	0	5	12	**21**

Table 3 (cont'd)

It would be an enjoyable experience for me	**0**	**0**	**2**	**14**	22
Hesitancy to work with a therapy dog	1	2	6	8	**21**
I like therapy dogs	0	0	7	7	**24**
The dog would benefit from the interaction	4	5	1	10	**18**
It would be an uncomfortable experience for me	**18**	9	6	4	1
The dog would benefit from the new setting	0	0	4	14	**20**

Relationship Between Trauma and Beliefs About Shelter Dogs

Further analysis was performed to determine if an increasing number of traumatic life events were associated with agreeing or disagreeing with beliefs related to shelter dogs, therapy dogs, and AAT. Results from the logistic regression analysis are reported as odds ratios in Table 4. As the number of traumas increased, statistically significant associations were identified for likelihood of agreement with the following questions; enjoyment related to enjoy working with a shelter dog (OR: 1.268, CI: 0.995 – 1.616), benefits for participating benefit shelter dogs due to interaction with a person (OR:1.436, CI: 1.037 – 1.988) and time out of the kennel (OR:1.512, CI: 1.016 – 2.249) Respondents with multiple traumas were 1.297 (CI: 1.036 – 1.623) times

more likely to report working with a shelter dog as a familiar experience for them. Finally, respondents were 1.403 (CI 1.094 – 1.799) times more likely to agree that AAT with a shelter dog would be beneficial because of possible shared trauma, as traumas increased. No questions related to therapy dogs revealed a compounding effect of trauma and how respondents answered the questions (Table 5).

Table 4: *Odds ratio estimates of how likely each respondent would choose the most popular answer for each Likert-style question related to shelter dogs, based on trauma tally.*

Parameter	X^2	df	p-value	OR	Upper CI	Lower CI	p-value
Make the dog more adoptable	21.8680	2	<.001	1.222	0.897	1.666	0.1762
Shelter dogs have behavior problems	0.1390	2	0.9329	1.181	0.925	1.508	0.1562
It would be comforting for me	**1.8851**	**2**	**0.3896**	**1.148**	**0.904**	**1.456**	**0.2454**
It would be enjoyable to me	1.0625	2	**0.5879**	1.268	0.995	1.616	**0.0478**
It would be a new experience for me	4.7551	3	0.1906	1.297	1.036	1.623	0.0305
It would be comforting for me	**1.8851**	**2**	**0.3896**	**1.148**	**0.904**	**1.456**	**0.2454**

Table 4 (cont'd)

Parameter	X²	df	p-value	Effects Size	Upper CI	Lower CI	p-value
I would feel uncomfortable working with a shelter dog	**25.0607**	**3**	**<.001**	**1.191**	**0.930**	**1.525**	**0.1498**
People would think of me in a positive way for working with a shelter dog	2.1500	2	0.3413	1.274	0.984	1.650	0.0539
We would both benefit due to shared trauma	16.5904	3	<.001	1.403	1.094	1.799	**0.0052**

Table 5: Odds ratio estimates of how likely each respondent would choose the most popular answer for each Likert-style question related to therapy dogs, based on trauma tally.

Parameter	X²	df	p-value	Effects Size	Upper CI	Lower CI	p-value
The dog would benefit from the interaction	**0.0001**	**1**	**0.9912**	**1.253**	**0.936**	**1.676**	**0.1033**
It would be a comforting experience for me	0.0029	1	0.9571	1.278	0.977	1.670	0.0637

Table 5 (cont'd)

It would be an enjoyable experience for me	**1.1682**	**1**	**0.2798**	**1.045**	**0.822**	**1.329**	**0.7128**
I am hesitant to work with a therapy dog	7.1459	3	0.0674	1.126	0.887	1.429	0.3245
I like therapy dogs	3.7435	1	0.0530	1.132	0.875	1.465	0.3468
It would be a new experience for me	31.9108	3	<0.001	0.885	0.703	1.114	0.2972
I would feel uncomfortable working with a therapy animal	2.9093	3	0.4058	1.157	0.916	1.462	0.2189
The therapy dog would benefit from the new setting	4.4367	1	0.0352	1.022	0.811	1.288	0.8626

Discussion

Pertaining to both shelter dogs and certified therapy dogs, respondents tended to agree with statements that indicated AAT would be a positive experience, either for themselves or the dog participants. The lack of bias against working with shelter dogs was of specific interest to the authors who were developing AAT programming. However, the survey did not report any stigmas related to shelter dog behavior. These results differ from previous reports (Mornement et

al., 2012), which reported that one third of their study population thought that shelter dogs have behavior problems. The majority of respondents in our study also indicated agreement with AAT being beneficial for canine participants, both shelter and therapy dogs. For shelter dogs in particular, this was further supported by results from our questions related to the dogs benefitting from the socialization with humans and benefitting from the out of kennel time. In addition, respondents' trauma history was associated with a desire to participate in AAT to benefit the canines involved. Respondents from this study who had multiple traumas, as documented on the Life Events Checklist, wanted to engage in AAT not because it would be beneficial to themselves, but because of the potential to improve the lives of the shelter dog participants. It is interesting to note that this phenomenon was not seen with any of the certified therapy dog questions. Another notable finding is that most people surveyed offered neutral responses relative to their views on shared trauma. This could be explained by the survey results which revealed that more than half of respondents were uncertain about prior mistreatment of shelter dogs. Thus, respondents could not apply the construct of shared trauma to the scenario due to lack of knowledge related to shelter dogs' prior histories.

The survey as a whole may have caught the interest of those who already have some background information about AAT, or some sort of life experiences that would make them interested in pursuing therapy. This may be an explanation as to why there were so few respondents with no trauma history (only 5 out of the total of 39 usable responses). However, this aligns with the current data indicating that the majority of the population worldwide has experiences at least one trauma in their lifetime (Solomon et al. 1997). Therefore, our sample may still be representative of the general population.

Limitations

It is important to keep in mind that the respondents for this study were self-selected and recruited through social media. Therefore, the distribution of the survey itself could have led to potential bias. The Facebook ad for the study was displayed on a page related to companion animal behavior and welfare. Thus, it was likely that most respondents had a preexisting fondness for dogs. This is apparent since all participants who completed the survey indicated that they would want to work with a dog in AAT, which is most likely not representative of the population as a whole. In future, it would be beneficial to distribute this or similar survey to wider audience and incentivize participation to reduce selection bias. to make results more broadly applicable.

Another survey limitation comes from the sample size being quite small, which makes any interpretations of the data to the general population difficult. Although there were over 100 respondents in the survey, nearly 40 of these responses were usable, due to nonresponse errors in the data. Many respondents started the survey and stopped answering questions at some point in the survey or answered some questions from one section and some from another. Despite two extensions to the Facebook ad distribution, a sizeable pool of respondents was not obtained. For future studies, it may be worthwhile to pursue multiple forms of distribution, instead of relying on only one way to access respondents. Perhaps advertising on different platforms, including modes that do not rely on an internet connection, would help reach more respondents. Additionally, the phenomenon of survey fatigue should be considered with greater importance in future studies. The survey that was implemented in this study had an extensive array of questions related to both trauma and AAT. Utilizing this survey, but in a quicker format (such as a 'select all that apply' option instead of filling out each trauma individually) would help immensely in

47

this regard. A 'select all that apply' option would also help immensely with confusion when respondents leave answers to certain traumas blank.

Conclusion

The main takeaways from this survey study are that the study population did not have a preference for the type of dog they would like to work with in AAT, bias towards or against shelter dogs is not present in this sample, and the opportunity to work with a dog in AAT would be a favorable experience. In addition, the person's trauma history was associated with the potential benefit to the dog participants. With these points in mind, it is reasonable to assume that implementing shelter dogs into AAT would be an overall neutral or perhaps beneficial addition to AAT programming. It is important to ensure both parties involved in AAT are experiencing positive welfare. Selecting shelter dogs for use in AAT has potential benefits that have yet to be explored. Therefore, a reasonable next step in terms of expanding this limited research field would be to develop a selection process to determine appropriate shelter dogs for use in AAT.

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CHAPTER 3: BEHAVIORAL ASSESSMENTS

Introduction

Survivors of sexual trauma experience greater risks for depression, anxiety, substance abuse, post-traumatic stress disorder (PTSD), and suicide (Campbell et al, 2009). Animal Assisted Therapy (AAT) has been successfully incorporated into sexual trauma treatment with a reported decrease in associated symptoms (Dietz et al., 2012). AAT applies the human-animal bond (HAB) in a goal-directed manner under the guidance of a healthcare provider. Adding canines to the therapeutic context may improve help-seeking behavior and further the therapeutic alliance between clients and therapists (Fine, 2019). Working with shelter dogs in particular may lead to mutually beneficial outcomes, as trauma survivors may empathize with perceived historical trauma of the shelter dog (Mornement et al , 2012) and experience the benefits of prosocial behavior (Birkett et al. 2018; Greenberg, 2018; Hoffman, 2008; Lim & DeSteno, 2016; Volhardt et al. 2011) while the dogs may experience enrichment and stress reduction (Coppola et al, 2006).

There is limited information about selecting shelter dogs for participation in AAT. The aim of this study was to evaluate if behavioral assessments can identify shelter dogs that work well in and have positive experiences during AAT. It was hypothesized that dogs exhibiting high levels of resilience, impulse control, social plasticity, frustration tolerance, cognitive flexibility, and empathy would predict a dog's suitability for and comfort with AAT. Behavioral assessments of these candidate attributes were based on approaches used in previous studies (Asher et al. 2013; Bray et al. 2020; Dalla Villa et al. 2017; Dowling-Guyer et al. 2011; Gosling 2001; Harvey et al. 2016; Fratkin et al. 2013; Lucidi et al. 2005; Posluns et al. 2017; Rayment et al. 2015; Riemer et al. 2014; Walker et al. 2016; Wright et al. 2012).

Materials and Methods

This research was approved by the Michigan State University's Institutional Animal Care and Use Committee (ID: PROTO202000202(ID: PROTO202000202prior to the start of data collection.

Description of Canine Participants

Canine participants were recruited from the Ingham County Animal Control and Shelter (600 Buhl Street, Mason MI 48854), and the simulated AAT sessions took place in a room within this facility. Our sample population (55 total dogs used in AAT) consisted of mostly mixed-breed dogs (69.1%). Ages ranged from 10 months to 13 years with a majority aged within 0-3 years (58.18%). Thirty dogs out of the total population were male, with 73.33% of males being neutered. Twenty-five dogs out of the population were female, with 36% of those females being spayed. See Table16 in Appendix for complete population totals.

Day 1: Behavioral Assessments

Data collection for each dog was carried out in a two-day format, with behavior assessments on day 1 and engagement in a simulated animal assisted therapy session on day 2. On day 1, three shelter dogs were chosen at random (via a random number generator) from a list of available shelter dogs. The order of the dogs to be assessed first, second, and third was also picked at random. Each dog was taken from the kennel and allowed to relieve himself/herself prior to the start of the assessments. The order of the behavioral assessments was intentional, with the least stimulating assessment first (the cylinder detour task) and finishes with the most stimulating assessment (the novel object test), to attempt not to affect arousal and subsequent assessments.

Impulsivity

To assess impulsivity, frustration tolerance, and cognitive flexibility, the cylinder detour task was utilized (Diamond, 1981). The purpose of the cylinder detour task is to measure inhibitory control, which can be described as the ability to suppress an initial response in favor of one that would ultimately be more productive (Bray et al. 2020). It is best to choose dogs with a high level of inhibitory control for a therapy setting because there can be many distracting factors involved, which may unhinge the relaxed environment if the dog were to become too aroused (Brady et al. 2019; Bray et al. 2020; Brucks et al. 2017; Wright et al. 2012; Range et al. 2011; Riemer et al. 2014; Miller et al. 2010; Mongillo et al. 2019). The novel sights and sounds of the therapy setting, such as meeting new people and exposure to different experiences may divert the dog participant's attention, causing disruption to the therapy setting.

For the cylinder detour task, pictured in Figure 1, a course was designed to detour the dog to a reward location, while avoiding a reward that is in-view, but inaccessible (behind a clear container, Figure 1)) (Bray et al. 2020). Cognitive flexibility was tested in the cylinder detour task through reversal learning (Bray et al. 2020). The dogs had to learn a different route to the reward in this task, and thus it was a measure to how flexible they are in their cognitive abilities. Prior to conducting the impulsivity assessment, the dogs engaged in a familiarization period, during which the dogs identified their preferred route to access a treat reward. The reward was shown to the dog, and then dropped into an opaque cylinder through an opening in the top of the cylinder. The dog was then encouraged to obtain the reward from the cylinder after the treat was dropped through a spoken cue ("Okay!" said in a high-pitched, friendly tone). After two trials of this familiarization period, the opaque cylinder was switched out for a transparent one. The procedures were the same as for the familiarization trials, that is, the treat was dropped

into the cylinder through a hole in the top, and the dog was encouraged to access the treat through the same verbal cue. Five trails were conducted with the transparent cylinder. The dependent measure is proportion of trials that the dog successfully retrieved the food from either side opening of the cylinder, without first touching the exterior of the apparatus, and the average latency to obtain the reward. For the reversal learning task, the preferred end for entrance to the reward was obstructed, so the dog had to switch sides of entry in order to obtain the reward. Five test trials were conducted. The dependent measure was the proportion of trials that the dog performed the correct detour response without first touching the barrier (Bray et al. 2020). The side of the apparatus that the subject first approached (i.e., open or blocked) and the average latency to obtain the reward were recorded as measures of response flexibility (Bray et al. 2020). Average latency was a cutoff, with a failing score having an average latency of >1 minute.
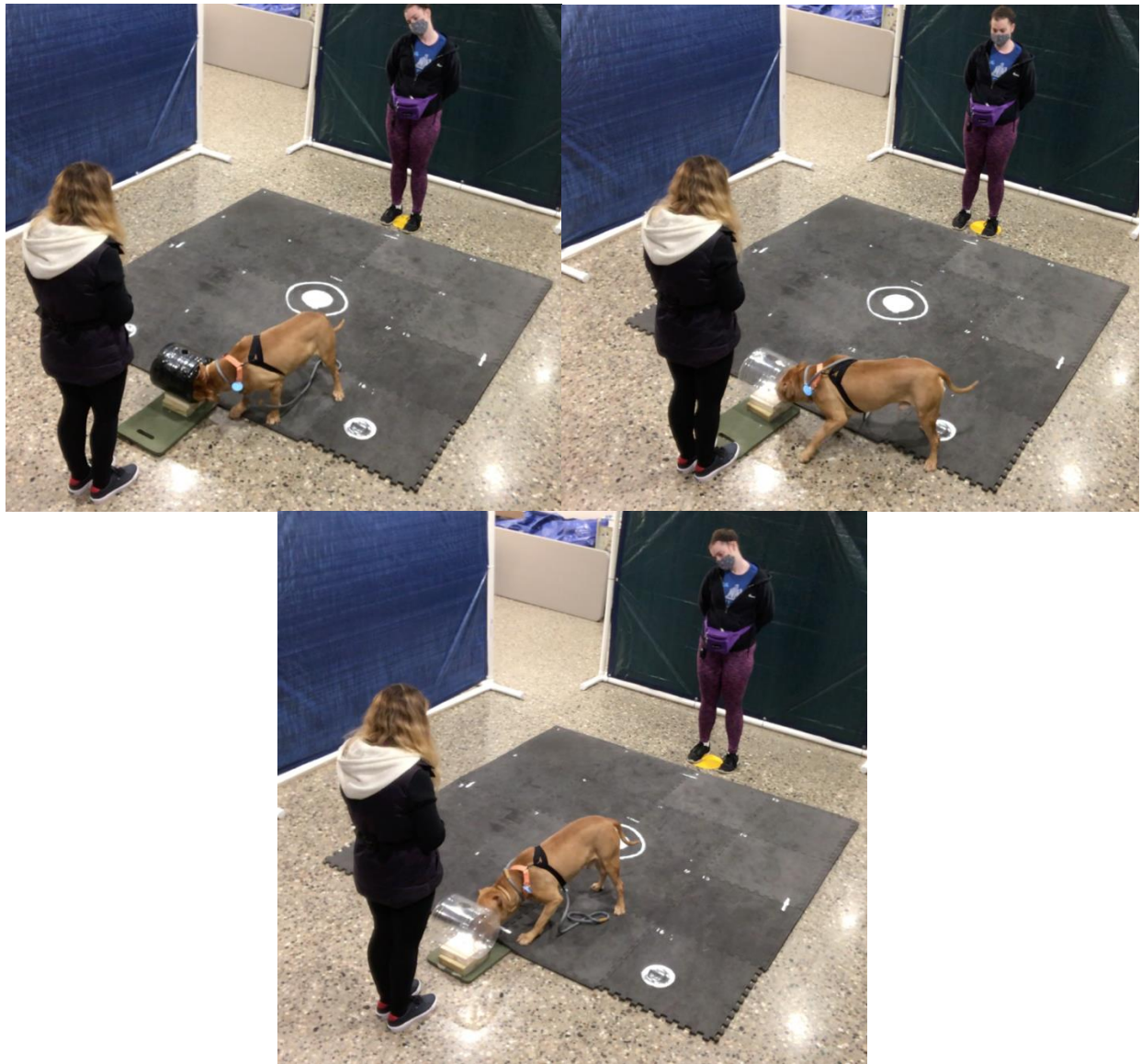
Figure 1: *Demonstration of the cylinder detour task. The task starts off with two familiarization trials, where the cylinder is open on both sides, but opaque (top left). The dog may approach the treat from either side. For the next step, the opaque cylinder is replaced for a clear one (top right), and the dog can obtain the treat from either side. The final part of the task (bottom middle) uses a clear cylinder but blocks off the dog's preferred end of entry.*

Pointing Test

The capacity for dogs to understand human gestures has been previously reported in the social cognition literature (Cunnigham & Ramos 2014; Hare & Tomasello 1998; Huber et al. 2016; MacLean et al. 2017; Miklósi et al. 2000; Miklósi et al. 2003; Soproni et al. 2001; Udell et al. 2008; Udell et al. 2016). Being able to recognize when the patient is upset and in need of affection is crucial. Therefore, a therapy dog must be able to understand human cues and recognize human emotions in order to respond accordingly, thus displaying social cognition. The procedures of the pointing test from Hare (1999) were adapted for this experiment.

In this test, two bowls are placed in front of the dog. (Figure 2).. One bowl is baited, and the other is sham baited. The experimenter then enacts a pointing gesture to indicate which of the bowls contains a food reward. The dog must rely on this human gesture in order to pick the correct bowl and obtain the reward. For the pointing task, the experimenter was in a standing position 2.5m away from the dog. Two metal food bowls were placed 1.5m apart from each other in the experimental room. The experimenter baited one of the bowls at random, and then sham baited the other bowl, all while the dog was observing. The dog needed to see the baiting of the bowls in order to understand that there was a reward placed inside. After baiting and sham baiting the bowls, the experimenter then enacted the pointing gesture towards the bowl actually containing the reward. This pointing gesture lasted a total of three seconds. After this gesture, the dog was released to approach one of the bowls. For this task, the bowl first approached (baited or unbaited) and the average latency to obtain the reward were recorded.
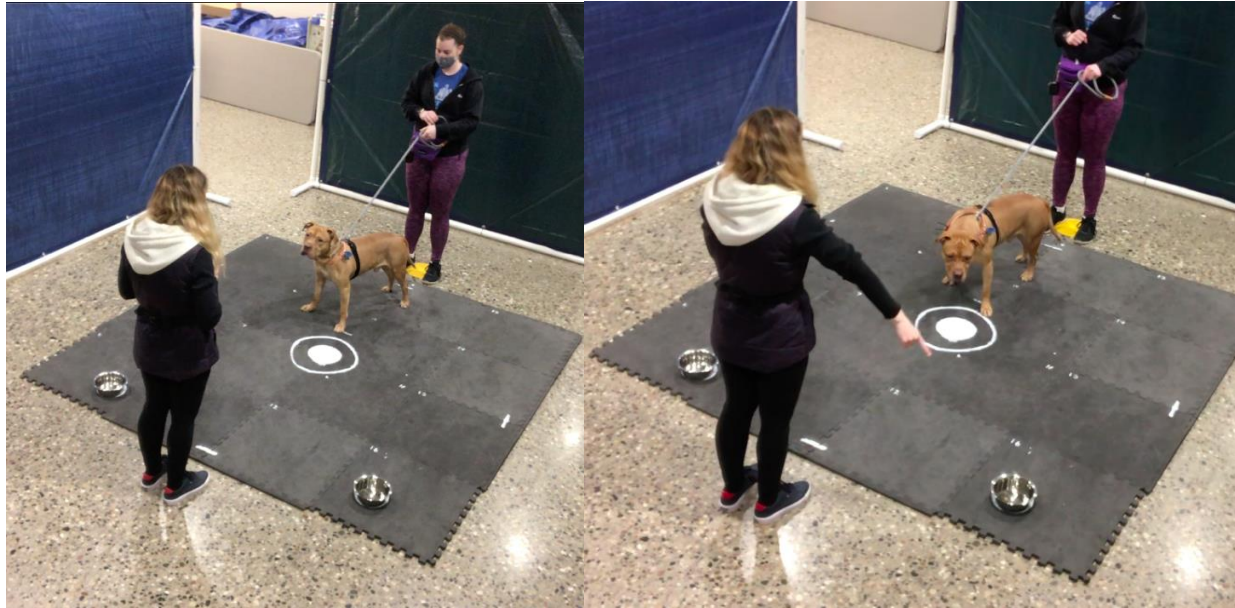
Figure 2*: Demonstration of the pointing test. The dog is shown the baiting and sham baiting of both bowls (left). Then, the experimenter enacts a pointing gesture (right) in order to signal to the dog which side actually contains a treat.*

Impossible Test

Another way to assess how dogs communicate with people is to see how they respond to a difficult task, and if they rely on asking people for help. This behavior could facilitate more communication, since the dog will appear attentive to the handler. The "impossible test" can be used to appreciate the dog's problem-solving persistence. The degree of focus the dog shows at attempting to solve the task, despite their futile efforts, is a way of assessing persistence. However, for this task we were most interested in the gazing behavior of the dog, that is, how long it takes the dog to divert their focus from the task in order to "ask" the human observer for help (Cavalli et al. 2019, Carballo et al. 2020, Marshal-Pescini, 2017). When the test becomes impossible, i.e., when the way for the treat to be accessed is blocked, dogs have been shown to look back at a person as a way of asking for help (Mikloski et al. 2003). Although this behavior

could indicate a of lack of persistence, for our purposes we want a dog that is willing to look back at their handler.

We utilized procedures similar to those conducted by Cavalli (2020). A plastic container with a sealed lid was used for this task, with the lid secured down to a foam base. (Fig 3.).. During the familiarization period, the bowl was placed at a specific distance away from the dog (2.5 m away). The experimenter showed the dog the treat, and then placed it on top of the plastic container lid, and then placed the Tupperware container on top of the lid, covering the treat. The dog observed the baiting and was released to access the treat. This familiarization procedure was repeated three times. The dog needed to successfully move the container to access the reward two out of three times to progress to the impossible trials. For the impossible trials, the Tupperware lid was baited in the same way as during the familiarization trial, except the container was secured to the lid so it could no longer be knocked off. The dogs were directed to the same sitting position 2.5 m away. The dog was allowed to approach the bin and attempt to access the reward. Latency of gazing behavior toward the investigator was noted during this impossible trial. If the dog did not gaze toward the investigator, the test was ceased. If the dog displayed gazed back toward the investigator, the investigator procured the treat for the dog. Then the impossible trial was repeated to ascertain if dogs were likely to gaze back at the handler more quickly upon a subsequent trial.
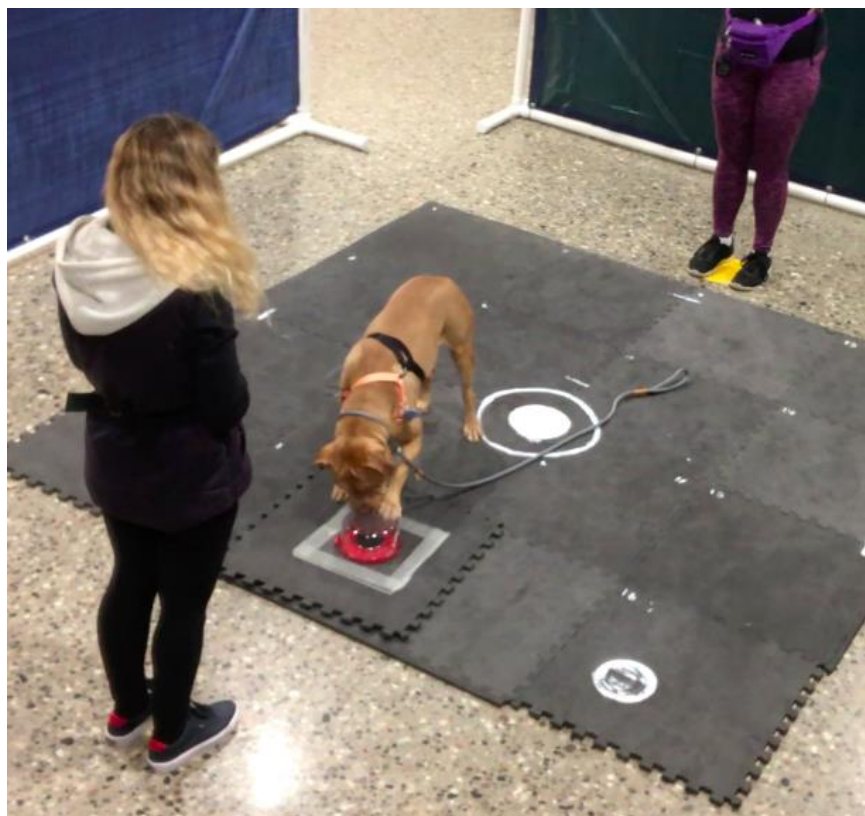
Figure 3: *Demonstration of the impossible task. The dog is seen here attempting to knock off the container, however it is now secured in place.*

Empathy

As stated previously, we hypothesize that dogs with greater empathy (i.e., those dogs who show greater signs of distress, or more willingness to engage with the person, during the crying trial) will work better as therapy animals, since they can pick up on human emotions and react appropriately to them in a therapy situation. A dog that is attuned to the emotional state of a human, and can act in a comforting manner in response, may be a better fit for AAT. To assess empathy in shelter dogs, procedures from Meyers-Manor and Botten (2020) were adapted. In this experiment, an experimenter is asked to either pretend to laugh or cry in front of the dogs and their behavioral reactions and engagement with the human actor were recorded.

To assess empathy, each dog was subjected to an experimental condition where the experimenter was laughing and the experimenter was crying; (Figure 4); the procedures were adapted from Meyers-Manor and Botten, 2020 (Figure 5). . During both conditions, the experimenter pretended to cry or to laugh for an interval of 20 seconds. Dogs were exposed to each emotion in random order while the experimenter remained seated. The experiment tried to maintain consistent volumes during both emotions and did not look at, speak to, or initiated contact with the dog. Two 30-second control conditions during which the experimenter recited the alphabet in a calm, monotone voice occurred between each emotion condition. Behaviors of the dogs were recorded on video and subjected to later analysis.

Figure 4: *Demonstration of the empathy assessment. On the left, the dog is subject to the crying condition and is displaying the preferred behavior (engaging in facial contact). On the right, the dog is subject to the laughing condition.*
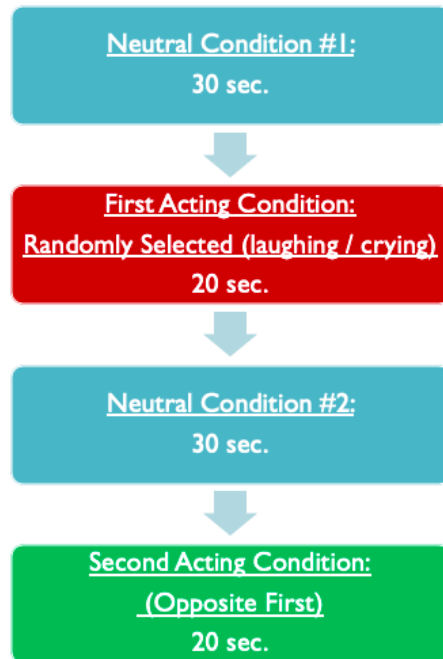
Figure 5: *Timeline of empathy assessment, with each acting condition preceded by a neutral condition.*

Novel Object

The novel object test was utilized to assess the dogs' resilience after being exposed to an arousing stimulus (Marshal-Pescini, 2017). By exposing the dog to a fast-moving object producing sound they have likely never experienced before, an understanding of how the dog will react to provocative stimuli in other situations may be inferred. If the dog can remain calm or recover quickly after initial reaction, they may be inherently more adept at controlling their behavior around starting stimuli. Choosing dogs who are more likely to be calm in stressful situations will help to keep patients at ease in an AAT environment.

During the novel object test, dogs were exposed to a remote-control toy (Really RAD Robots – Electronic Remote Control Robot with Voice Command, Figure 6). While the dog was behind a curtain, the novel object was placed on the ground of the test room. The dog was

brought out from behind the curtain and allowed up to 30 seconds to investigate the object while

remaining turned off. Latency to make contact with the object was recorded. After this 30-second

period, the dog was once again brought behind the curtain and the experimenter turned on the

object. The dog was once again brought out and the object was left on for a period of 30 seconds.

Again, the trial was stopped if the dog made contact with the object, and latency to make contact

was recorded. For the last 30 seconds, the object remained in the off position, and latency to

make contact was gathered similar to the first off condition.

Figure 6: *Demonstration of the novel object test. Pictured here, the dog is subjected to the novel object during the "on" condition, where the object is spinning and making noise.*

Day 2: Simulated Animal-Assisted Therapy Experience

The second day of data collection was devoted to the simulated AAT experience. Dogs assessed in the behavioral assessments the day prior qualified for use in the AAT experience. Only two of the three dogs could be chosen, since only 2 human participants participated in each session. If all three dogs were still available for use on the subsequent day, two of the three dogs would be chosen at random. The two human participants were asked to fill out an initial survey with demographic information, as well as the Mood Feeling Scale (MFS) and the Stress Feeling Scale (SFS). The MFS and SFS were used in order to determine the baseline mood and stress levels of the participants prior to the AAT experience. After filling out the initial survey, the procedures were explained to the participants and the AAT session began.

The activities involved in the AAT experience varied depending on the week of participation. Upon recruitment, human participants agreed to participate in 2 consecutive weeks of simulated AAT.. The first week of participation involved basic training and basic grounding exercises used in therapy. Participants were instructed on how to teach the dogs a "touch" command, where the palm of the participant's hand is shown to the dog, and the dog must make contact with the hand via their nose. Positive reinforcement was used to associate the behavior with a reward. The human participants were also instructed on how to teach the "sit" command (by luring the treat above the dog's head until they sat on their back legs) and was reinforced with treats. The final part of the session involved grounding exercises for the human participants, where they were instructed to state five things they could see in the room, four things they could hear, three things they could feel, two things they could smell, and one thing they could taste. After each example was listed, the dogs were rewarded. The activities for the subsequent week involved teaching the human participants therapeutic touches for the dog participants. The

placement and movement of their hands was demonstrated and they were informed to reward the dog after each touch was performed. Similarly, after this activity, the participants went through the same grounding exercise as the previous week.

After the AAT experience was finished, the participants were asked to fill out a second survey. This survey contained the Human-Animal Interaction Scale (HAIS) (Fournier et al. 2016). The HAIS is a self-reporting survey that is used to describe and quantify behaviors of humans and animals during a human-animal interaction. The Mood Feeling Scale (MFS) and Stress Feeling Scale (SFS) were also used, in order to quantify the current mood and stress levels of the participants. Finally, an open-ended question asked participants to leave feedback and rate their overall experience.

Human Population

All participants were part of a convenience sample of undergraduate college students having associations with the Department of Animal Science, or ties with the university's Animal Welfare Club. Human subjects ages ranged from 18 to 31 years age, though most (89.5%) were between 18 and 23 years. Human participants identified as either female (86.8%) or non-specified genders (13.2%), Most participants indicated that they were very comfortable working with dogs (71.1%) and most participants owned their own dogs at home, whether that be a family dog in the parental home or in their own home (79%).

Analysis

Video Analysis

For the cylinder detour task, latency to obtain the reward was scored and input for analysis. Two raters coded latencies independently of each other. Interclass correlation coefficients (ICC) were then calculated to analyze their agreement. ICC was used to compare

continuous data between the two observers. The ICC score was 0.534 (confidence limits: 0.116-0.798) with a p-value of 0.0075, indicating poor inter-rater reliability. This could be due to the several changes to the scoring system for the video analysis throughout the research. The trained observer most likely had been miscalculating averages, and since only averages were reported, initial observations for each trial of each assessment could not be determined and calculated properly. A pass/fail score also recorded for both the cylinder detour task and pointing test. The pass/fail score was needed to indicate whether or not the dogs performed above chance (I.e. obtained the treat correctly without mistake) when obtaining the treat (chance was marked by a success ratio of 50%). Obtaining the reward was determined as the moment the dog made contact with the treat.

For the impossible test, eye contact with the investigator was measured in a binary (yes/no) manner. Dog who gazed back at the investigator were coded as help-seeking, and their latency to make eye contact was also recorded. Help-seeking dogs were evaluated during a second trial and their latency to gaze was again recorded. If the dog's latency to make eye contact improved, that is, the dog displayed eye contact more quickly than in the first trial, these dogs were labelled as "learners," marked by a binary yes or no category.

Person-oriented behaviors have been previously reported as markers of empathy (Custance & Mayer, 2012; Meyers-Manor & Botten, 2020; Huber et al. 2017; Sanford et al. 2018).2018). Meyers-Manor & Botten (2020) indicated that positive displays of emotion do not cause any significant change in the behavior or physiological state of dogs, and suggested the use of positive displays of emotion, such as laughing, could be used as a control condition instead of a neutral display of emotion, such as humming. Since our study relied on an adapted version of the empathy test used in Meyers-Manor & Botten (2020)'s research, the positive emotional

valence of laughing in our study was used as the control condition. For the crying condition, we specifically evaluated facial contact with the investigator. This was identified as clear effort to be in close proximity toto the experimenter's facial region. This contact was made by placing their front paws on the lap of the experimenter and craning their neck to the experimenter's face. Facial contact with the investigator was reported in binary (yes/no) manner. The order of condition (ie, cry or laugh first) was also noted in coding.

Finally, for the novel object test, each dog was assessed on the latency to approach and make physical contact with the object during each of the three conditions (the first off condition, the on condition, and the second off condition).). ICC scores were analyzed for two independent observers. Interrater reliability had a score of 0.866 (confidence limits: 0.691 - 0.946), 0.64 (confidence limits: 0.256 - 0.849) and 0.904 (confidence limits: 0.753 - 0.965) for the first off condition, the on condition, and the final off condition, respectively. The categories were split into three groups, dogs that were quick to approach (i.e. dogs that approached the object quickly and made contact), slow to approach (i.e. dogs that approached the object slowly and made contact), and dogs that never touched the object. For coding purposes, the cutoff for classifying approach as "fast" or "slow" was three seconds.

Statistical Analysis

Covariates were separated into categories based on signalment factors. Human participants were categorized by gender, as well as age in a binary manner of greater than 21 or less than 21, since this was the midpoint of the range of ages.. Covariates for the AAT session were the rating of mood prior to the therapy session (gathered through MFS), and rating of stress prior to the therapy session (gathered through the SFS). Outcome variables for the AATAAT session are described as follows:: composite rating of the dog's behavior based on human observation (using the HAIS), improvement in mood after AAT (binary yes/no), and improvement in stress levels

(binary yes/no). The natural log of each variable revealed a linear relationship, and no significant outliers were observed in each variable, nor was there any multicollinearity in the set. Each variable was also proved to be independent of other variables in analysis. Therefore, assumptions of ordinal regression were met before beginning ordinal regression analysis.

Results

Based on respondent feedback post-AAT session, outlined in Table 6, the overall experience was rated very highly. Nearly 85% of participants reported the AAT experience to be very positive, and 15% of respondents reported that it was somewhat positive. No participants reported having a neutral, somewhat negative, or very negative experience.

Table 6: Overall experience scores and difference between pre- and post-AAT session. These are totals out of 38 human participants.

Report of AAT Experience	Number of Participants	Percent of Total
Very Positive	32	84.21%
Table 6 (cont'd)		
Somewhat Positive	**6**	**15.79%**

The experience for dog participants as measured via HAIS also showed positive results, outlined in Table 7. A higher score on the HAIS indicates that the dogs displayed positive behavioral indicators frequently and rejected interaction infrequently (range: -8 to 8). Out of the 47 dog participants with complete HAIS profiles, almost 90% of dogs had a net positive experience (HAIS greater than 0). Of those, 74.47% of the dogs had HAIS scores greater than or equal to four, and 14.89% had HAIS scores between 1 and 3 on the HAIS. Only two dog participants

were reported as having a net neutral experience (HAIS equal to 0), and three participants were observed as having a negative experience (HAIS less than 0).

Table 7: Overall HAIS scores out of 47 dog participants with complete HAIS profiles.

Report of AAT Experience	Number of Dogs	Percent of Total
Very Positive (HAIS: ≥ 4)	35	74.47%
Positive (HAIS: 1-3)	7	14.89%
Neutral (HAIS: = 0)	2	4.26%
Negative (HAIS: < 0)	3	6.38%

The ability for dogs to work alongside another dog, outlined in Table 8, was an important aspect of the therapy sessions, since the AAT programming used was a group format. Out of the total 48 dog participants with complete data for both the HAIS and group work scores, 75% of dogs could successfully work alongside another dog, with 31.25% of these dogs reported as having a positive experience.

Table 8: Group work scores. These are totals out of 48 dog participants with complete HAIS data and group work data.

Report of AAT Experience	Number of Participants	Percent of Total
Unable to Work in Group Setting	12	25%
Able to Work in Group Setting	36	75%
Positive Experience and Able to work in a group setting	15	31.25%

Referring to Table 9, around half of all participants also experienced an improvement to their MFS and SFS scores (54.84% and 41.94%, respectively). Other participants experienced no change to their mood or stress scores after the AAT session, with only about a third of participants having no net change to mood (32.26%) and stress (29.03%). Only a few individuals reported an increase in stress and mood levels post-AAT session (99.68% and 33.23%, respectively).

Table 9: MFS and SFS scores and difference between pre- and post-AAT session. These are totals out of 31 unique human and dog participant combinations.

Post-AAT Experience	Number of Participants	Percent of Total
Improved MFS	17	54.84%
Improved SFS	13	41.94%
No change (MFS)	10	32.26%
No change (SFS)	9	29.03%
MFS Negatively Affected	1	3.23%
SFS Negatively Affected	3	9.68%

A paired t-test revealed a significant difference in mood and stress pre- and post AAT session, outlined in Table 10. In both cases, mood (t = -6.24, p-value = <0.001) and stress (t = -5.18, p-value = <0.001) improved post-session.

Table 10: Difference between pre- and post-MFS and SFS scores. These are totals out of 38 AAT sessions.

Pre- vs. Post-AAT Experience	t-value	p-value
MFSMFSMFSMFSMFS	-6.24	<0.001
SFSSFSSFSSFSSFS	-5.18	<0.001

Research Question 1: Is there a correlation between human outcomes during AAT and dog outcomes during AAT?

The first research question related to whether there was a correlation between human outcomes (MFS and SFS scores pre- and post-session) and dog outcomes (composite HAIS scores). Stress scores were separated into three categorical groups: 1 indicating that SFS improved post-AAT session, 0 indicating SFS remained the same, and –1 indicating SFS worsened post-AAT session. Mood scores were categorized in an identical fashion. The HAIS variable was also split into three categories; -1 indicated a sum score on the HAIS of ≤ 0, 0 indicating an HAIS score of 1 to 3, and 1 indicating an HAIS score of 4 or greater. For this variable, a higher score indicates that the dog displayed more positive behavioral indicators. The KW test was chosen to analyze dependent variables, since our independent variable, the HAIS, categorizes outcomes in a ranking system (a Likert-style scale). Therefore, the KW test was deemed most appropriate since it distinguishes variables based on rank order. The analysis from the first research question revealed no significant relationships (see Table 11).

Table 11: *HAIS scores compared to mood and stress scores post-AAT session. Out of 48 total pairings of human and dog participants, 39 had completed HAIS and mood scores, and 38 had completed HAIS and stress scores.*

Parameter	df	X^2	KW (p-value)
HAIS vs. MFS	2	3.0031	0.2228
HAIS vs. SFS	2	2.5616	0.2778

Research Question 2: Do dog behavioral assessment outcomes predict dog experience during AAT?

The second research question attempted to determine if there was a relationship between dog behavioral assessment outcomes and dog HAIS scores. Because the HAIS variable is a three-level ordinal variable, as described in the first research question analysis, it was first subject to the score test for proportional odds. The behavioral variables for this analysis include the latency on the reversal trial of the cylinder detour task, whether the dogs performed above chance on the pointing test, if the dogs made facial contact in either acting condition of the empathy assessment, if the dogs improved their scores in the second trial of the impossible test, if the dogs gazed at the investigator during the impossible test, and what categories the dogs fell into when it came to latency to make contact with the object in the novel object test. Similar to the first research question, all variables were subjected first to univariate analysis, then to logistic regression analysis to see if any variables could be fit into a multivariate model, and finally subjected to the KW test for variables that did not fit the model.

After performing the logistic regression analysis, reversal trial in the cylinder detour task was revealed to be not significant (OROR = 1.083, CI: 0.964 – 1.216, p-value=0.1790). Analysis

of variables that involve social cognition, such as the pointing test and help seeking behavior in the impossible test, were significant (see Table 12). Only about half of all dog participants (24/49) performed above chance in the pointing test, that is, they correctly chose the bowl containing the treat based on following the human point indicating where the treat was located. Despite this, the analysis for the KW test was still significant, with a p-value of 0.0314. Only around one-third of dog participants (17/49) displayed the help seeking behavior during the impossible task, however, analysis for this variable also proved significant, with a p-value from the KW test being 0.0322. The KW analysis for all other variables were non-significant, as referenced in Table 12.

Table 12: Out of 48 total dog participants in the behavioral assessments 40 had complete profiles for the pointing task, 43 for the help seekers parameter, 39 for the learners parameter, 43 for facial contact during the laughing and crying conditions each, and 43 for the novel object assessment.

Parameter	df	X^2	p-value
Pointing Test	1	0.2096	0.0314
Helper seekers	1	0.1857	0.0322
Learners	1	0.6122	0.0556
Crying Condition	12	14.45	0.4947
Laughing Condition	5	3.2667	0.8668
Novel Object (off 1)	2	0.5929	0.0865
Novel Object (on)	2	6.2439	0.5554
Novel Object (off 2)	2	0.4316	0.8597

Research Question 3: Does the dog's ability to work alongside another dog affect HAIS, SFS, and MFS scores in the AAT setting?

The third research question attempted to explain if a dog's ability to work alongside another dog affected HAIS scores, mood scores, and stress scores during the AAT scenario. The variable indicating whether the dogs could work alongside another dog was binary. The HAIS, mood, and stress scores were coded similarly to previous analysis, by finishing utilizing the KW test. Scores on the HAIS seemed to not be affected by the dog's ability to work alongside another dog, based on results from the KW test (p-value = 0.2180; Table 13).MFS and SFS were also not affected by the dog's ability to work alongside another dog.

Table 13: Out of 48 total dog participants in the behavioral assessments, only 24 had complete profiles for the reversal trail as well as the HAIS score.

Parameter	df	X^2	KW (p-value)
HAIS	1	0.2180	0.1247
MFS	1	0.1212	0.5215
SFS	1	0.1495	0.5266
MFS & SFS	1	0.7686	0.3806

Research Question 4: Is performance on the behavioral assessments predictive of the dog's ability to work alongside another dog?

The dog's ability to work alongside another dog was also analyzed against their performance on the behavioral assessments to determine whether a relationship exists. Whether. Whether or not dogs were able to work alongside another dog (dependent variable) was

compared to the behavioral assessment variables as described in the second research question. Analysis was performed in the same three part process as previously described. There was a trend in terms of whether or not dogs improved their score on the impossible test (that is, decreased the amount of time they took to display a referential gaze, deemed "learners") was statistically related to if they were able to work alongside another dog (p-value = 0.0722), in terms of a positive correlation. All other variables in this analysis were nonsignificant, as outlined in Table 14.

Table 14: *Out of 48 total dog participants in the behavioral assessments, only 24 had complete profiles for the reversal trail as well as the coping score, 37 for the pointing task and coping, 40 for the helpers parameter and coping, 35 for the learners parameter and coping, 18 for facial contact during the crying condition and coping, 4 for the laughing condition and coping, and 38 for the first two trials of the novel object test and 37 for the last trial of the novel object test compared to coping.*

Parameter	df	X^2	p-value
Reversal Task	1	n/a	n/a
Pointing Test	1	0.2413	0.6233
Helpers	1	0.1815	0.6701
Learners	1	3.2322	0.0722
Crying Condition	13	10.3766	0.2733
Laughing Condition	2	1.500	0.5839
Novel Object (off 1)	2	3.6703	0.1600

Table 14 (cont'd)

Novel Object (on)	**2**	**1.991**	**0.5507**
Novel Object (off 2)	2	2.2456	0.3531

Research Question 5: Is there a difference in human experience (MFS+ SFS) based on type of dog worked with (owned or shelter dog)?

For the final research question, a relationship between MFS and SFS was compared to the type of dog that participants worked with, either an owned, dog or a shelter dog. Again, analysis was performed in the same three part process as previously described. The type of dog that participated in AAT revealed no significant effect on MFS and SFS (Table 15).

Table 15: Out of 32 dog participants in the first week of AAT, 6 were owned pet dogs, and the rest were shelter dogs.

Parameter	Df	KW (p-value)
MFS	1	0.6945
SFS	1	0.5465

Discussion

Notably, all human participants reported that the AAT scenario was a positive experience, and, most individuals had improvements to their mood and stress scores (MFS and SFS) following the session. In addition, nearly all dog participants (89.36%) appeared to enjoy the experience, based on the number of positive behavioral indicators they displayed s measured via HAIS. Furthermore, over three-quarters of the participant dogs' HAIS scores indicated that

they displayed positive indicators of behavior frequently, and negative indicators of behavior infrequently. The study would have benefitted from objective physiological indicators of affective state, such as heart rate variability, oxytocin levels, and/or cortisol levels (Fourneir, 2016; Ogi et al. 2020). However, relying on the HAIS can be argued as a sufficient measure for understanding the dogs' experiences, given its previously reported reliability, internal consistency, and construct validity (Fourneir, 2016). Finally, when compared to similar scales, such as the Companion Animal Bonding Scale (CABS) and the Companion Animal Semantic Differential, overall convergent validity was established (Fournier, 2016).

Despite the majority of both human and canine participants having positive experiences, neither species' experiences were contingent on the other's experience. Although this strays away from the goals of a One Welfare approach, it may be explained by the lack variation in the study population, and thus few comparisons can be made in order to determine a relationship. However, it may be worth consideration of the positive experiences of human participants relative to the COVID-19 pandemic. The study took place during the first semester when in-person learning and on-campus activities resumed. It could be that students were isolated and feeling lonely, and participation in the study was one of the first in-person social experiences they had since quarantining (Buecker & Horstmann, 2021; Lukács, 2021). Therefore, the sudden change in social engagement could have significantly improved their mood, no matter the context of the experience (Williams et al. 2021).

Limitations and Future Directions

One drawback regarding the human population is that they were self-selected students. However, it is reasonable to suspect that someone with an interest in pursuing AAT would be someone with an interest in animals, so having a study population of people that are comfortable

and interested in working alongside animals provides necessary insight into the target

population. Although, the study could have benefitted from a larger selection pool of

participants, of varying ages and life experiences, rather than all college-aged university

students.

Only the first week of AAT data was analyzed in order to avoid duplicate human and/or

dog participants during AAT. Comparisons of mood and stress scores between weeks one and

two of participation were made but revealed no significant relationships. Post-session

improvements in mood and stress scores were consistent and thus likely attributable to the

sessions despite each week involving different activities and different dogs. If a multiple week

AAT program were to be studied again, cohorts of human participants should be analyzed prior

to the beginning of all sessions, after each session, and again upon completion of the program.

Information should also be gathered to determine whether additional support and/or treatment is

being obtained elsewhere.

Before beginning the study, it was hypothesized that working with a shelter dog would

improve mood and stress scores to a greater degree than working with owned dogs. When

undergoing the two-week AAT program, participants were informed whether they were working

with an owned pet dog, or a dog residing at the shelter that day. Therefore, there was the

potential for a bias to be formed based on the type of dog the participant worked with. However,

there were no significant relationships in this study in terms of the type of dog worked with,

based on the human participants' experiences. It is interesting to note how our hypothesis was

refuted by this evidence, even with the potential for bias. From this study, it can only be

concluded that regardless of the type of dog worked with, the overall AAT experience was

enjoyable for the participant. However, the experience of the owned dogs was not tracked during

the AAT session. Therefore, no meaningful relationships in terms of the dogs and whether they were owned dogs or shelter dogs could be made. The study could have been able to make more meaningful comparisons between owned dogs and shelter dogs if the experience of the owned dogs was recorded, such as if shelter dogs enjoyed the experience more than owned dogs. Another study addressing mood and stress levels after working with different types of dogs, where participants are blind to the type of dog they are working with, may still be worth pursuing. Perhaps another type of dog, a trained therapy animal for instance, could be compared to pet dogs and shelter dogs in order to see how mood and stress levels of human participants are affected, and enjoyment of the different types of dog participants should be tracked.

A deficit of the behavioral assessment was lack of screening for dogs capable of working in proximity to other dogs. This could relate to the protocols of our experiment. The ability for a dog to work alongside another dog was not explicitly tested for during the behavioral assessments. Therefore, during the AAT session, there was no way of knowing beforehand of the dogs were capable of group work. For future studies of group AAT, dogs should be tested for their ability to work alongside another dog prior to the simulated AAT experience, such as through a subtest where a dog is exposed to a stuffed dog, or an unreactive dog, and their reactions are assessed (Netto & Planta, 1997; Reid & Collins, 2012; Van den Berg et al. 2003). However, despite the fact that dogs had a difficult time adapting to the group work environment, HAIS scores were not affected by the dog's ability to work alongside another dog. Similarly, the human's experience as measured via changes in MFS and SFS did not change significantly in relation to the dog's ability to work alongside another dog. This could relate to a deficit in the protocols of our experiment regarding the ability of dogs to work alongside another dog. If dogs were deemed unfit to work alongside another dog (due to excessive barking, jumping, or

inability to focus on the handler) the dogs were separated into two rooms and the simulated AAT session carried on with two independent groups. Most dogs were able to regain focus after being separated, so therefore on the human end, it would make sense that they would perceive the overall experience as successful and enjoyable after the separation. It was interesting to note that when at an alpha of 0.10, help seeking behavior (as measured via gazing toward the investigator during the impossible test) was statistically related to the dog's ability work alongside another dog. This could relate to the construct of communication with people. Dogs who were more attuned to their handlers, and therefore were quicker to focus on their faces, could be better at following cues and directions from their handlers, thus making them less reactive to the dog working next to them.

Conclusion

Overall, the simulated AAT experience was positive and a success in terms of maintaining the well-being of both the human and dog participants. The behavioral assessments were minimally predictive of AAT performance and experience. Aspects that involved social cognition demonstrated correlation with HAIS scores. The takeaway from this study is that additional screening of shelter dogs may not be essential to identify dogs who are suitable and comfortable during certain AAT programs, especially when human participants are highly educated regarding animal behavior. However, addition screening is likely warranted for group AAT programming.

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CHAPTER 4: SUMMARY AND CONCLUSIONS

The goal of this thesis was to establish if there could be any preference or benefit to incorporating shelter dogs into an AAT for trauma survivors, as well as to identify shelter dogs that would work well and experience positive welfare in a group AAT setting.

Based on results from the survey, respondents were more likely to agree with statements related to wanting to make the AAT experience enjoyable on the dog end. This relationship was only significant for questions related to shelter dogs. Respondents wanted to ensure that the dog (that is, the shelter dog in particular) participant was getting just as much out of the AAT experience as they were. Furthermore, this effect was compounded when trauma history was taken into account, as the number of traumas that the participant experienced in their lifetime increased, the more likely they were to agree with these statements, indicating a compounding effect. This compounding effect of trauma was not apparent when questions related to trained therapy animals, it only related to questions related to shelter dogs. Although the survey population did not appear to have any inherent bias either for or against their perception of shelter dogs, it does appear that they consider their wellbeing during AAT a great deal more than compared to trained therapy animals, when trauma history was taken into account. This seems to support our hypothesis that people who have experienced trauma on average have higher degrees of empathy, and thus display more prosocial behavior.

The next part of the thesis attempted to find out how to choose the most appropriate dog participants for AAT. It was hypothesized that certain behavioral traits would be present in individual dogs, and these traits would help them in the AAT environment. The behavioral assessments had little predictive power in terms of the AAT session. Performance on the behavioral assessments did not determine if the AAT session was a success or not. Results from

the AAT scenario showed that all of the human participants found the AAT session enjoyable, and the majority of dog participants were perceived as having a positive experience as well. This was regardless of their performance on the behavioral assessments and their ability to work alongside another dog during the AAT session. Lack of variability in the study populations could be an explanation for these results, or perhaps the behavioral assessments we selected to include in this experiment were not the best predictor of enjoyment of AAT.

From these studies a general theme can be drawn. It seems that no matter the type of dog worked with, their characteristics or abilities, the simulated AAT experience was mutually beneficial for both the human participants and dog participants.

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Table 16: *Study Animal Population*

Animal Population Totals	
Mixed Breed Dogs	38
Purebred Dogs	11
Ages 0-3	32
Ages 4-6	11
Ages 7+	6
Intact Females	16
Intact Males	8
Neutered Males	22
Spayed Females	9
Small Breed (<30 lbs.)	2
Medium Breed (31-50 lbs.)	13
Large Breed (51-70 lbs.)	17
Extra Large Breed (71+ lbs.)	10
Total Number of Participant Dogs	55

Table 17: *Shelter Statistics (2020)*

Shelter Statistics	
Total Live Intakes	2161
Live Release	1859
Lifesaving Percentage	86.0%

Opinions of Shelter Dogs Survey

Thank you for your interest in our survey. This 10 to 15-minute questionnaire will ask you questions related to animal-assisted therapy and includes questions about your trauma history. Your participation in this survey is voluntary. You can skip any question you do not wish to answer. Because this survey is anonymous, you can only withdraw from the study before you submit the survey. You must be 18 or older to participate.

If you have any questions, please contact Dr. Marie Hopfensperger (hopfens1@msu.edu) or Dr.

Jacquelyn Jacobs (jacob175@msu.edu); Dr. Hopfensperger can also be reached via phone (517.353.5420).

By clicking on the "agree" button below, you indicate your voluntary agreement to participate in this online survey.

○ Agree and continue to the survey (1)

○ Do not agree (2)

How old are you?

○ < 18 years old (Please stop here. Thank you for your interest in our survey and programming; however, this survey has been approved for adults only.) (1)

○ > 18 years old (2)

Which of the following describes how you think of your gender identity? Please select one option.

○ Male (1)

○ Female (2)

○ Non-binary / third gender (3)

○ Prefer not to say (4)

○ Write in option, below: (5) _____

Do you identify yourself as Hispanic, Latino, or Spanish?

○ Yes (1)

○ No (2)

○ Prefer not to say (3)

How do you identify yourself? (select all that apply)

☐ Native American or Alaska Native (1)

☐ Asian (2)

☐ Black or African American (3)

☐ Native Hawaiian or Pacific Islander (4)

☐ White (5)

☐ Other (6)

☐ Prefer not to say (7)

Which of the following best describes the area where you spent the majority of your adolescence? (0-18 years of age)

○ Urban (1)

○ Suburban (2)

○ Rural (3)

Which of the following best describes the area you live now?

○ Urban (1)

○ Suburban (2)

○ Rural (3)

What is your highest degree or level of education completed?

○ Some high school, no diploma (1)

○ High school graduate, diploma or equivalent (GED) (2)

○ Some college credit, no diploma (3)

○ Trade/technical/vocational training (4)

○ Undergraduate degree (5)

○ Masters degree (6)

○ Professional or doctorate degree (e.g., MD, DVM, PhD) (7)

Life Events Checklist Listed below are a number of difficult or stressful things that sometimes happen to people. **For each event check one or more of the boxes to the right to indicate that:** (a) it happened to you personally; (b) you witnessed it happen to someone else; (c) you learned about it happening to a close family member or close friend; (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder); (e) you're not sure if it fits; or (f) it doesn't apply to you. Be sure to consider your entire life (growing up as well as adulthood) as you go through the list of events.

	Your age when event first occurred	This Event…
Natural disaster (for example, flood, hurricane, tornado, earthquake) (1)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Fire or explosion (2)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Transportation accident (for example, car accident, boat accident, train wreck, plane crash) (3)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply

97

Serious accident at work, home, or during recreational (4)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Exposure to toxic substance (for example, dangerous chemicals, radiation) (5)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Physical assault (for example, being attacked, hit, slapped, kicked, beaten up) (6)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb) (7)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm) (8)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Other unwanted or uncomfortable sexual experience (9)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Combat or exposure to a war-zone (in the military or as a civilian) (10)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war) (11)	o Less than 11 years old (1) o Between 12 and 17 years old (2)	o Happened to me o Witnessed it o Learned about it o Part of my job

	o 18 years or older (3) o Does not apply (4)	o Not sure o Does not apply
Life-threatening illness or injury (12)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Severe human (or animal) suffering (or neglect) (13)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Sudden violent death (for example, homicide, suicide) (14)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Serious injury, harm, or death you caused to someone else (15)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply
Any other very stressful event or experience: (16)	o Less than 11 years old (1) o Between 12 and 17 years old (2) o 18 years or older (3) o Does not apply (4)	o Happened to me o Witnessed it o Learned about it o Part of my job o Not sure o Does not apply

Please read the description of animal-assisted therapy below.

What is animal-assisted therapy (AAT)?
AAT is a type of treatment in which an animal, such as a dog, is part of the therapeutic process. AAT is delivered by human healthcare providers in group or individual therapy settings. It is intended to benefit people physically, socially, emotionally, and cognitively.

Would you want to work with a dog in an animal-assisted therapy environment?

○ Yes (1)

○ No (2)

○ I don't know (3)

Dogs from <u>animal shelters</u> can be part of AAT. They are screened first to make sure they are safe to work with. Would you want to work with a screened **<u>shelter dog</u>** in AAT?

○ Yes (1)

○ No (2)

○ I don't know (3)

In your opinion, who would benefit from working with a screened **<u>shelter dog</u>**?

○ I would benefit (1)

○ The dog would benefit (2)

○ Both of us would benefit (3)

Below is a list of responses that reflect opinions about **<u>shelter dogs</u>**.

Using the five-point scale shown, please mark the answer that best reflects whether you agree or disagree with each statement.

Shelter dogs are likely to have behavior problems

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

Shelter dogs are likely to have been mistreated in their previous homes

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

Please use this space to add any other opinions you have about shelter dogs. (when you hear the term 'shelter dog' what comes to mind about the animal?)

_____

_____

_____

_____

_____

Below is a list of possible reasons people have for wanting or not wanting to work with **shelter dogs** in an AAT setting.

Using the five-point scale shown, please mark the answer that best reflects whether you agree or disagree with each statement.

I like **shelter dogs**

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

Working with a **shelter dog** would make me feel like I had done a good deed.

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

Working with a **<u>shelter dog</u>** would provide me with comfort

    ○ Strongly Disagree (1)

    ○ Disagree (2)

    ○ Neither agree nor disagree (3)

    ○ Agree (4)

    ○ Strongly agree (5)

Working with a **<u>shelter dog</u>** would be something new to me

    ○ Strongly Disagree (1)

    ○ Disagree (2)

    ○ Neither agree nor disagree (3)

    ○ Agree (4)

    ○ Strongly agree (5)

Working with a **<u>shelter dog</u>** would be something I would enjoy

    ○ Strongly Disagree (1)

    ○ Disagree (2)

    ○ Neither agree nor disagree (3)

    ○ Agree (4)

    ○ Strongly agree (5)

Working with a **<u>shelter dog</u>** is outside of my comfort zone

   ○ Strongly Disagree (1)

   ○ Disagree (2)

   ○ Neither agree nor disagree (3)

   ○ Agree (4)

   ○ Strongly agree (5)

People would think of me in a positive way for working with a **<u>shelter dog</u>**

   ○ Strongly Disagree (1)

   ○ Disagree (2)

   ○ Neither agree nor disagree (3)

   ○ Agree (4)

   ○ Strongly agree (5)

I am hesitant to work with **<u>shelter dogs</u>**

   ○ Strongly Disagree (1)

   ○ Disagree (2)

   ○ Neither agree nor disagree (3)

   ○ Agree (4)

   ○ Strongly agree (5)

I would benefit from working through AAT with a **shelter dog** because we both have experienced trauma

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

I believe **shelter dogs** would benefit from interacting with humans

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

I believe **shelter dogs** would benefit from being outside of their kennel during AAT

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

AAT could help **shelter dogs** with behavioral issues they may have

    ○ Strongly Disagree (1)

    ○ Disagree (2)

    ○ Neither agree nor disagree (3)

    ○ Agree (4)

    ○ Strongly agree (5)

AAT might help **shelter dogs** who have been mistreated in previous homes

    ○ Strongly Disagree (1)

    ○ Disagree (2)

    ○ Neither agree nor disagree (3)

    ○ Agree (4)

    ○ Strongly agree (5)

Participating in AAT might make a **shelter dog** more adoptable

    ○ Strongly Disagree (1)

    ○ Disagree (2)

    ○ Neither agree nor disagree (3)

    ○ Agree (4)

    ○ Strongly agree (5)

Please use this space to add any other reasons you would want to work with a **shelter dog**:

_____

Please use this space to add any other reasons you would **NOT** want to work with a **shelter dog**:

_____

Sometimes AAT involves **certified therapy dogs**.
These are dogs that receive training and are assessed for their skills and behavior by a professional organization prior to certification. Would you want to work with a certified therapy dog in an AAT setting?

○ Yes (1)

○ No (2)

○ I don't know (3)

In your opinion, who would benefit from working with a **certified therapy dog**?

○ I would benefit (1)

○ The dog would benefit (2)

○ Both of us would benefit (3)

Below is a list of possible reasons people have for wanting or not wanting to work with **certified therapy dogs** in an AAT setting.

Using the five-point scale shown, please mark the answer that best reflects whether you agree or disagree with each statement.

I like **certified therapy dogs**

    ○ Strongly Disagree (1)

    ○ Disagree (2)

    ○ Neither agree nor disagree (3)

    ○ Agree (4)

    ○ Strongly agree (5)

Working with a **certified therapy dog** would provide me with comfort

    ○ Strongly Disagree (1)

    ○ Disagree (2)

    ○ Neither agree nor disagree (3)

    ○ Agree (4)

    ○ Strongly agree (5)

Working with a **certified therapy dog** would be something new to me

    ○ Strongly Disagree (1)

    ○ Disagree (2)

    ○ Neither agree nor disagree (3)

    ○ Agree (4)

    ○ Strongly agree (5)

Working with a **certified therapy dog** would be something I would enjoy

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

Working with a **certified therapy dog** is outside of my comfort zone

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

I am hesitant to work with **certified therapy dogs**

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

I believe **certified therapy dogs** benefit from interacting with humans

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

I believe **certified therapy dogs** would benefit from the opportunity to be in a new setting

○ Strongly Disagree (1)

○ Disagree (2)

○ Neither agree nor disagree (3)

○ Agree (4)

○ Strongly agree (5)

Please use this space to add any other reasons you <u>would want to</u> or not want to work with a **certified therapy dog**:

_____

Please use this space to add any other reasons you <u>would **NOT** want to</u> work with a **certified therapy dog**:

_____

Thank you for taking the time to complete this survey!
  We would like to share the following resources with you:

National Resources

1. RAINN Sexual Assault Hotline
a.   https://www.rainn.org/about-national-sexual-assault-telephone-hotline

2. National Alliance of Mental Health
a.   https://www.nami.org/help

3. Substance Abuse and Mental Health Services Administration
a.   https://www.samhsa.gov/find-help/national-helpline   MSU Resources
1. MSU Counseling and Psychiatric Services (CAPS)
a.   https://caps.msu.edu/

2. CAPS CRISIS SUPPORT
a.   CAPS is providing remote crisis services 24/7/365. Students can call us at 517-355-8270 and press "1" at the prompt to speak with a crisis counselor. Other prompt options are available for those not in crisis.

3. MSU CENTER FOR SURVIVORS
a.   Services include crisis intervention, advocacy, individual and group therapy, workshops, and resources. To arrange an appointment call 517-355-3551. To learn about the Center for Survivors visit https://centerforsurvivors.msu.edu/about-us/

4. MSU SEXUAL ASSAULT CRISIS HOTLINE
a.   24/7/365 hotline – 517-672-6666

5. MSU CENTER FOR SURVIVORS CRISIS CHAT
a.   MSU's Center for Survivors offers a crisis chat from 10am-10PM EST, 7 days a week staffed by sexual assault crisis intervention trained volunteers. Support includes discussing feelings related to sexual assault or sexual harassment, connecting to campus and local resources, information about advocacy services (housing, academic, medical, legal), answering questions about sexual assault or harassment. Click to chat and learn more here: https://centerforsurvivors.msu.edu/crisis-chat/