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The Meaning and Motivation of Children Participating in Animal-Assisted Therapy: A Pilot Study

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Keywords: dogs, pediatrics, motivation, animal-assisted therapy, occupational therapy

Abstract Background: Despite claims that animal-assisted therapy is beneficial, there is limited empirical evidence supporting this. Current literature supports the physical, emotional, and psychological benefits an animal can provide, but few studies have explored the outcomes of incorporating an animal into skilled treatment facilitated by a healthcare professional. This study seeks to explore the effects of animal-assisted therapy in outpatient pediatric occupational therapy practice.

Purpose: The purpose of this research is to explore the meaningfulness and motivation animal-assisted therapy interventions provide for pediatric clients when compared with traditional occupational therapy treatment.

Methods: Researchers utilized a within-participants repeated-measures design for this study. Children receiving animal-assisted therapy at a private practice occupational therapy clinic were videoed performing therapeutic activities with a licensed occupational therapist and trained dogs. The videos were gathered both with and without the animal present in the therapy session and coded to determine the meaningfulness and motivation of animal-assisted therapy versus traditional therapy without a dog.

Results: Statistical analysis indicated that the childrens' scores for initiating interactions with the therapist were significantly higher in the without dog condition than in the live dog condition. Furthermore, four out of the five children demonstrated increased on task/dog comments in the live dog condition than in the stuffed dog condition. The specific intervention activity performed influenced children's engagement and enjoyment of animal-assisted therapy interventions.

Conclusion: This pilot study provides preliminary evidence that animal-assisted therapy increases children's enjoyment and engagement during therapeutic activities when a dog was present. Furthermore, the type of animal-assisted therapy activity performed may influence the children's motivation to participate.

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Introduction/Scientific Background

The human-animal bond, or the relationship between humans and other species, has been a topic of study for decades and has led to the development of the field of human-animal interaction (Fine, Tedeschi, & Elvove, 2015). One of the explanations for the human-animal bond is the biophilia hypothesis, which states that humans are genetically predisposed to pay attention to animals and other living things, which may have effects on health and well-being (Beck & Katcher, 2003; Fine et al., 2015). Furthermore, a person's implicit motivation, the drive to do something for personal satisfaction or enjoyment, is influenced directly by the environment experienced through the senses, including receiving information from animals (Beetz, 2017). A person's response to an animal's nonverbal communication can build trust and companionship, which will influence the person's motivation to engage in activities with the animal. Animal-assisted therapy (or AAT) seeks to maximize the connection between humans and animals to aid in therapeutic treatment of disease and disability (Animal Assisted Intervention International, 2018; Sams, Fortney, & Willenbring, 2006). By definition, AAT is facilitated by a licensed/degreed professional who uses their expertise to incorporate a trained animal-handler team into skilled treatment sessions with the goal of increasing the functional abilities of clients (Animal Assisted Intervention International, 2018). The therapeutic value of AAT has been gaining recognition by healthcare professionals as an accepted addition to treatment of children (Yap, Scheinberg, & Williams, 2017).

While clients report that the presence of animals results in positive outcomes related to occupational therapy (OT) goals and occupational therapists have reported the effectiveness of AAT, there is limited research evidence regarding the role of AAT in the field of occupational therapy (Ashraf, Vigil, Crowe, & Winkle, 2017; Velde, Cipriani, & Fisher, 2005). The role of AAT in occupational therapy practice is an important area for further research to add to the evidence base of the profession, and to further explore the role of animals in OT treatment.

Currently, animal-assisted therapy terminology is not well defined in the literature as many articles on studies incorporating animals do not describe skilled interventions led by a professional. A systematic review of the animal-assisted therapy literature found that only 14 studies correctly use the term "animal-assisted therapy" to describe a professional incorporating animals in a skilled treatment setting (Ashraf et al., 2017). Most of these articles show a low level of research evidence, further emphasizing the need to perform higher level research on the role of animals in professional practice settings.

Animal Influence on Health

There are published studies that support the physiological benefits of the presence of an animal on children's health and well-being (Braun, Stangler, Narveson, & Pettingell, 2009; Tsai, Friedmann, & Thomas, 2010). Research evidence supports that the presence of a dog has been shown to reduce pain perception in children postsurgery and during hospitalization (Braun et al., 2009; Calcaterra et al., 2015; Sobo, Eng, & Kassity-Krich, 2006). Furthermore, the presence of a dog during a stressful experience reduced blood pressure, heart rate, and distress in children (Nagengast, Baun, Megel, & Leibowitz, 1997). According to Tsai, hospitalized children had lower systolic blood pressure when interacting with a dog and blood pressure measurements continued to decrease even after the dog had left. Kaminski, Pellino, and Wish (2002) found that hospitalized children participating in pet therapy sessions had increased positive affect when interacting with a dog and the parents of the children reported a significantly happier mood when interacting with a dog than when participating in a child-life therapy group. A study by Vitztum, Kelly, and Cheng (2016) provides support that dogs can also influence physical activity levels, as there was a significant increase in physical activity during dog walking interventions for adolescents with orthopedic limitations. These studies describe encounters with an animal that fall under the definition of "animal-assisted activities." Animal-assisted activities are a type of animal-assisted intervention

that differs from animal-assisted therapy as visits are provided by an animal-handler team and do not address an individual's treatment-specific goals but provide opportunities to interact with animals to enhance quality of life (Animal Assisted Intervention International, 2018; Millhouse-Flourie, 2004).

Animal-Assisted Therapy

When included in skilled treatment, dogs have been shown to influence the psychological and emotional health of children (Dietz, Davis, & Pennings, 2012; Hamama et al., 2011; Stefanini, Martino, Allori, Galeotti, & Tani, 2015). When children with severe psychological diagnoses worked with a dog as part of their psychology treatment sessions, there was a significant decrease in internalizing symptoms and significant increase in overall functioning when compared to a control group (Stefanini et al., 2015). For children who have experienced trauma, group therapy sessions incorporating dogs resulted in a decrease in trauma symptoms, including anxiety and depression (Dietz et al., 2012). Teenage girls who had experienced trauma and participated in therapy with dogs had fewer psychological symptoms related to post-traumatic stress disorder (PTSD) and demonstrated a lower risk of developing PTSD (Hamama et al., 2011).

Some studies specifically addressed animal-assisted therapy outcomes for children diagnosed with autism. When participating in psychology treatment sessions with AAT, children with autism were found to display positive behaviors more frequently and for longer amounts of time and to demonstrate increased interactions with the therapist (Silva, Correia, Lima, Magalhães, & de Sousa, 2011). Researchers reported that children with autism initiated social interactions more frequently when in the presence of a dog, which decreased the number of social prompts the therapist needed to provide (Grigore & Rusu, 2014). Within the field of occupational therapy, children with autism participating in animal-assisted therapy had significantly increased language use and social interaction when compared to traditional OT treatment (Sams et al., 2006). No other studies regarding the influence of AAT in pediatric occupational therapy treatment were found.

Theoretical Basis

The Model of Human Occupation (MOHO) was used to describe AAT in occupational therapy treatment. According to this model, one of the foundational aspects is volition, which is influenced by three interrelated aspects: personal causation, values, and interests (Lee & Kielhofner, 2017). Volition, or motivation to engage in occupations, is specifically targeted by animal-assisted therapy as an affinity for animals will influence children's motivation and willingness to engage in therapeutic activities involving animals.

Observation and anecdotal evidence from therapists supports the idea that animal-assisted therapy influences the volition component of the client as it provides motivation to participate in meaningful activities (Velde et al., 2005). This study sought to systematically explore whether the volition of children is influenced by occupational therapy sessions incorporating AAT. Since the presence of an animal has already been shown to influence the health and well-being of children, incorporating an animal in occupational therapy treatment may influence the factors that affect children's motivation to participate in activities that are hard for them, subsequently removing barriers to occupational performance.

Attachment theory also informs the practice of animal-assisted therapy as it describes the interaction and strong bond children can develop with animals. In attachment theory, interactions with others help a person to develop internal working models of self and others, which contribute to the development of emotional regulation and healthy relationships (Zilcha-Mano, Mikulincer, & Shaver, 2011). Attachment theory often describes interpersonal relationships among people and can also explain relationships with nonhuman entities, including the human-animal bond. Pets, especially dogs and cats, provide proximity, which is a component of attachment that offers a sense of security and enhances well-being (Sable, 2013). Researchers provided

support for a significantly higher attachment and bond to a dog in young children who have less access to parents (i.e., in single-parent households), when compared to young children from two-parent households (Bodsworth & Coleman, 2001). An animal can also promote meaningful relationships in a therapeutic environment; animals incorporated as an adjunct to treatment promoted positive rapport between the therapist and the client (McCullough et al., 2018).

Significance and Purpose

The purpose of this study was to determine the meaningfulness and motivation of AAT in pediatric occupational therapy practice. This study used practice-based evidence, a methodology that obtains data from real-world clinical practice settings to describe trends in patient care and their outcomes (Cogan, Blanche, Díaz, Clark, & Chun, 2014). This approach allowed researchers to collect data about the current practice of AAT with the purpose of identifying the meaning and motivation children ascribe to these interventions. Practice-based evidence is a practical approach for clinical studies as it allows the research findings to be directly applied to clinical practice (Cogan et al., 2014).

Research Questions

The aim of this study was to determine if AAT with dogs influences the meaningfulness and motivation of occupational therapy interventions for pediatric clients receiving occupational therapy. The research questions included:

1. Are OT sessions utilizing animal-assisted therapy more meaningful to children than traditional occupational therapy sessions?
2. Do animal-assisted therapy sessions involving dogs increase children's motivation to participate in occupational therapy when compared to engagement during traditional occupational therapy sessions?

Methods

Participant Sample

Approval was obtained from the university institutional review board before initiation of the study. Children receiving occupational therapy services at a private practice occupational therapy clinic in the southwestern United States were recruited for the study. Participants (n = 5) were recruited through convenience sampling and ranged in age from 4 to 12 years old. Parents and children were informed of the study face to face during regularly scheduled occupational therapy appointments. Consent from parents and assent from children was obtained prior to inclusion in the study. An effort was made to include participants with different ages and diagnoses to determine the meaning and motivation animal-assisted therapy provides to a diverse participant sample. See Table 1 for more information regarding patient demographics. During the study, participants were video and audio recorded while engaging in three intervention activities. Each intervention activity was performed twice, once with a dog and once without a dog, for a total of 6 videos collected of each participant. A stuffed dog was used as a substitute for the without-dog condition. The occurrence of each treatment condition (stuffed dog/live dog) was randomized to vary which condition was presented first. The two conditions of each intervention activity were performed no less than two weeks apart to maintain the novelty of the activity, and only one of the intervention activities was videoed during each occupational therapy appointment. Clients were filmed for 10 minutes while completing the intervention activity. Video recordings were initiated at the beginning of the intervention session, and the location of the intervention activities was consistent across all sessions. Data was obtained over a 10-week period to collect all videos for the study.

Data Collection

Each of the three intervention activities was selected from published works developed by an occupational therapy practitioner experienced in creating and

Table 1 Demographic Data of Study Participants

Participant	Age	Gender	Primary Diagnosis (ICD-10 codes)
1	7	male	R62.50 Unspecified lack of expected normal physiological development in childhood
2	12	male	F71 Moderate intellectual disabilities
3	4	male	F84.8 Other pervasive developmental disorders
4	9	male	R62.50 Unspecified lack of expected normal physiological development in childhood
5	6	female	F90.1 Attention-deficit hyperactivity disorder, predominantly hyperactive type

Table 2 Intervention Activities

Activity	Description	Therapeutic Purpose
Flea Circus Construction	Child punches out paper "fleas" using a hole punch and then uses tweezer tongs to take them off different locations on the dog	Fine motor coordination, visual perceptual skills, spatial concepts
Hand Stand and Bend Over Backward	Child walks forward on hands with legs supported on therapy ball to deliver dog a treat; child sits on therapy ball and leans back to give dog a treat before sitting back up	Balance and coordination, abdominal muscle recruitment, vestibular and proprioceptive processing
Circus Dog	Child tosses treats or toy through hoop to encourage dog to jump through	Postural stability and balance, bilateral integration

implementing AAT interventions (Winkle, 2013a, 2013b). Activities included in the published works had undergone biomechanical and task analyses to determine the therapeutic value and safety of both the child and the dog during performance of the activity. These analyses were performed by at least three different occupational therapists. Each activity chosen addressed different occupational performance deficits to generalize findings to multiple areas of occupational performance. Refer to Table 2 for descriptions of each intervention activity in addition to the therapeutic value of each activity.

Three highly trained and experienced dogs that work at the clinic were chosen to be part of the study. Each dog was assigned to one of the three intervention activities, and the same dog performed the intervention activity with each child. To increase the generalizability of the findings, dogs of different sizes and colors were strategically chosen to participate in the interventions. Care was taken to ensure that animal welfare was maintained during the interventions. This was accomplished by instructing the children on safe ways to interact with the dogs. The dogs included in the study were familiar with the intervention activities and their role when performing these interventions. The occupational therapists facilitating the interventions are also dog trainers and can interpret dog behavior. The therapists monitored the dogs throughout the sessions to make sure the dogs were not demonstrating behaviors indicating stress during the therapeutic activity.

Coding Procedure. Prior to collecting the videos for analysis, six codes were developed to measure the children's behavior/verbalizations indicating meaning and motivation during animal-assisted therapy interventions. Table 3 provides a definition of each of the six codes used in the study. The

Table 3 Definitions of Behavior and Expression Codes

Code	Description
Positive Affect	Smiling or laughing during therapy sessions; positive affect must be coded while child is engaged in activity (silliness not coded)
Negative Affect	Frowning or crying; negative affect must be related to child engagement in activity
Initiating Interactions (Therapist)	Initiating interactions with therapist during session without prompting; the interactions can be touching, gesturing (such as waving hello or goodbye), or sharing objects with therapist
Initiating Interactions (Dog/Stuffed Dog)	Interaction with dog/stuffed dog that occurs without prompting; the interactions can be touching, gesturing (such as waving hello or goodbye), or sharing objects with dog/stuffed dog
On Task/Dog Comments	Verbal expression directly related to enjoyment of activity and/or engagement with dog; can include short phrases such as "yeah!" and "I did it!" and verbalizations mentioning the dog or stuffed dog by name or otherwise
Off Topic/ Disinterested/Bored Comments	Verbal expression indicating disengagement with activity

development of the coding procedure was influenced by previous studies that analyzed child behaviors and emotional expression in unstructured or semistructured settings (Martin & Farnum, 2002; O'Haire, McKenzie, McCune, & Slaughter, 2014). A presence/absence coding system was developed to determine the occurrence of the behaviors or verbalizations during the 10-minute sessions. The presence or absence of the behaviors and verbalizations were coded each minute of the 10-minute intervention activities. Codes were recorded in Excel documents that were deidentified to maintain confidentiality. The videos collected were analyzed by the first and third authors. The first author coded 30 videos and to ensure objectivity of analysis, the third author coded 10 of the videos, two from each child. This constituted approximately one-third of the videos, and consistency between coders was assumed to indicate objectivity of the coding procedure.

High ethical standards were maintained while conducting this study. This is evidenced by determining interrater reliability between the two coders to ensure objectivity of analysis. Furthermore, participants were not enrolled in the study before being informed of study aims and participant expectations. Once participants were enrolled in the study, each participant was assigned a numeric code to ensure confidentiality during the coding procedure and sharing of demographic data between research investigators, including the participant's age, gender, and diagnoses. Only the first and third author had access to a key that linked participants' names to the codes. The rigorous analysis each intervention activity underwent before inclusion in the study supported the safety of the clients and animals during the interventions.

Data Analysis

A within-participants, repeated measures study design was used to analyze the data. Each research participant was his or her own control as each subject had different diagnoses and abilities. Interrater reliability between coders was established using the intraclass correlation coefficient to determine the degree of variability between coders. Intraclass correlation coefficients were calculated using the Statistical Package for the Social Sciences (SPSS) version 25, based on a single rating, absolute agreement, 2-way mixed-effects model. While no standard values exist for reliability using the intraclass correlation coefficient, it is generally accepted that intraclass correlation coefficient values above .75 indicate good reliability (Portney & Watkins, 2015). In this study, the intraclass correlation was required to be .75 or above to be considered acceptable reliability between raters. If the intraclass correlation did not achieve clinical

significance, discrepancies were discussed and recoded until interrater reliability was established.

After interrater reliability was established, the behavioral and verbal codes obtained from each condition (stuffed dog and live dog) were analyzed using the Wilcoxon signed-rank test. This statistical test was used as it is a nonparametric test that can measure differences in within-subjects study designs where the dependent variable is ordinal (Leech, Barrett, & Morgan, 2015). The Wilcoxon signed-rank test also considers both the amount of difference that exists between the stuffed dog and live dog scores and the direction of the difference (Portney & Watkins, 2015). An alpha level of .05 was used for all statistical tests performed.

Results

A Wilcoxon signed-rank test indicated that the children's scores for initiating interactions with the therapist were significantly higher in the stuffed dog condition than in the live dog condition: $Z = -2.041$, $p < .041$. Furthermore, a Wilcoxon signed-rank test indicated that four out of the five children demonstrated increased on-task/dog comments in the live dog condition than in the stuffed dog condition: $Z = -1.786$, $p < .074$. See Table 4 for more details regarding p values for each of the six codes. To more clearly identify trends in the data, means and standard deviations of each of the six codes are reported in Table 5.

Table 4 Meaningfulness and Motivation of AAT Interventions

Behavioral or Expression Code	p value (alpha < .05)
Positive Affect	.194
Negative Affect	1.00
Initiating Interactions (Therapist)	.041
Initiating Interactions (Stuffed Dog/Dog)	.180
On Task/Dog Comments	.074
Off Topic/Disinterested/Bored Comments	.854

Table 5 Means and Standard Deviations Across All Activities for Both Conditions

Code	M (SD) Stuffed Dog	M (SD) Live Dog
Positive Affect	20.80 (10.28)	19.60 (11.41)
Negative Affect	2.40 (4.34)	2.40 (3.36)
Initiating Interactions (Therapist)	2.60 (1.52)	0.80 (1.10)
Initiating Interactions (Stuffed Dog/Dog)	1.80 (2.95)	1.20 (2.17)
On Task/Dog Comments	11.40 (5.32)	15.00 (5.29)
Off Topic/ Disinterested/Bored Comments	4.00 (5.39)	4.20 (3.42)

Wilcoxon signed-rank tests were performed on each intervention activity to determine significance between stuffed dog and live dog conditions for each of the verbal and behavioral codes. No significant differences or trends between conditions were noted. A Wilcoxon signed-rank test was also performed to compare live dog intervention activities to each other, to see if there were significant differences indicating that certain intervention activities may be more meaningful and motivating for children. The activity Circus Dog had significantly greater verbalizations indicating enjoyment of activity and engagement with the dog than Hand Stand/Bend Over Backward: $Z = -2.032$, $p < .042$. Furthermore, the Flea Circus activity approached significance in demonstrating increased verbalizations indicating enjoyment of activity and engagement with the dog when compared to Hand Stand/Bend Over Backward: $Z = -1.857$, $p < .063$.

Discussion

As stated above, children initiated interactions with the therapist significantly more with the stuffed

dog than with the live dog. While this may appear to indicate that the stuffed dog was more effective in eliciting interactions between the child and the therapist, this result may be due to additional factors. The same stuffed dog was used in all the stuffed dog interventions, and the consistency provided by the stuffed dog may have increased the children's familiarity and comfort level when performing the interventions, thus increasing interactions with the therapist throughout the activity. Furthermore, this study attempted to code behaviors and emotions during highly structured therapeutic activities. Due to the structured nature of each activity, less initiation of interactions with the therapist or stuffed/live dog was observed, especially when the children were focused and attending to the task. Thus, small variations in scoring contributed to the significance observed between conditions. During the intervention activities, the children were observed to have a good relationship and interact positively with the therapist, regardless of whether the stuffed or live dog was present. This indicates that while dogs may act as an attachment figure for children, the importance of the relationship the children develop with the therapist should also be emphasized, as this relationship can also contribute to development of emotional regulation and healthy relationships (Zilcha-Mano et al., 2011). Despite this, as children become more comfortable with the therapist they may switch attention to the dog condition, thus decreasing interaction with the therapist.

The video analysis occurred solely during the intervention activities, which influenced the spontaneous interactions observed between the children and the dogs. When arriving for occupational therapy sessions involving the live dog, the dogs were allowed to greet the children, and it was observed that the children were excited to see the dogs and would smile, talk to the dog, and initiate interactions with the dog through petting. These interactions were not part of the behavioral/expression analysis as the video was not started until the intervention activity began. While these spontaneous and organic interactions were not part of the occupational therapy interventions, they provide further information on the meaningfulness of the children's relationship with the dogs, which likely influences the children's motivation to participate in the therapeutic activities. In future studies, it would be beneficial to analyze children's interactions with animals during less structured intervention sessions to allow for more spontaneous interactions. Previous studies have explored children's behaviors when engaging with dogs in less structured environments, but currently none have been performed in the field of occupational therapy (Kaminski et al., 2002; Martin & Farnum, 2002; O'Haire et al., 2014). It is interesting to note that the young children were also excited to see the stuffed dog and would smile, pet it, and sometimes even give it a hug. The young children's schema of the stuffed dog appeared to be similar to that of the live dog. Because of this, a study design comparing animal-assisted therapy to traditional occupational therapy, with no stuffed dog, would provide a more accurate comparison of traditional OT treatment and AAT, especially for treatment of young children.

The children's verbalizations indicating enjoyment of the activity and engagement with the dog approached statistical significance, indicating that children's verbalizations of enjoyment and engagement were higher when the live dog was present. Previous research supports the idea that children demonstrated increased verbalizations in the presence of animals (Sams et al., 2006). While the presence or absence of the enjoyment/engagement verbalizations was analyzed in the current study, the content of the statements was not studied. To understand children's subjective experience during participation in AAT, a qualitative research methodology would provide more in-depth information on the children's thoughts and feelings during the animal-assisted therapy intervention sessions.

Another finding from this study indicated that the meaning and motivation of interventions was dependent on the specific intervention activity performed. Comments indicating enjoyment of activity and engagement with the live dog were higher in the Flea Circus and Circus Dog activities when compared with the Hand Stand/Bend Over Backward activity. This finding indicates that children may not only

value performing an intervention activity with a dog but may also value specific types of intervention activities. Children's values and interests are both components of their volition, or motivation to engage in activities (Lee & Kielhofner, 2017). Providing meaningful interventions that children are motivated to perform will enhance their occupational performance (Lee & Kielhofner, 2017). Further research should assess what factors contribute to the enjoyment of the animal-assisted activities for children as this information would indicate additional factors that affect the children's volition.

The limitations of this study include a small sample size. This influenced the ability to obtain statistical significance of study results. Continued research in this specialized area of practice should use larger sample sizes to increase the statistical power of the findings. Furthermore, the study enrolled participants with a variety of performance deficits and did not focus on the role of animal-assisted therapy in occupational therapy for specific treatment diagnoses. Continued research should explore the influence of animal-assisted therapy on specific performance deficits and diagnoses to determine if animal-assisted therapy is more effective for certain client populations. Incorporating animals in therapeutic treatment is starting to gain more recognition, and it is important that research continues to be performed in the field of occupational therapy to provide an evidence base for incorporating animal-assisted therapy interventions in practice.

Summary for Practitioners

When incorporating animals into professional practice, it is important that practitioners understand the terminology of animal-assisted therapy to ensure the animal is incorporated into treatment in a skilled way to address the client's goals (Animal Assisted Intervention International, 2018). The findings of this study support the biophilia hypothesis and motivation theory, indicating that animals may play a role in promoting health and well-being, in addition to increasing a child's implicit motivation to engage in a therapeutic activity (Animal Assisted Intervention International, 2018; Beck & Katcher, 2003; Beetz, 2017; Fine et al., 2015; Sams et al., 2006). This has potential clinical implications as increased engagement in therapeutic activities during animal-assisted therapy may increase the efficacy of the intervention's ability to mediate disease and disability (Beck & Katcher, 2003; Fine et al., 2015).

Previous research supports the benefits of the presence of an animal on physiological health, including decreased pain perception and lower heart rate, blood pressure, and distress (Braun et al., 2009; Nagengast et al., 1997; Tsai et al., 2010). According to the Model of Human Occupation, these physiological markers influence a person's "performance capacity," the person's ability to engage in occupations based on physical and mental aspects of performance in addition to the person's own perceptions of his or her performance (Lee & Kielhofner, 2017). The findings of this study indicate that children verbalized enjoyment of the activities more with a live dog present. Practitioners desire to provide an environment that promotes skill attainment, and the findings of this study indicate that the children were motivated by the presence of a dog, as indicated by increased verbalization of engagement and enjoyment, which may enhance occupational performance.

In the literature regarding animal-assisted therapy, many of the skilled interventions have been facilitated by mental health practitioners, and findings from these studies indicated that animal-assisted therapy decreased psychological symptoms (Dietz et al., 2012; Hamama, et al., 2011; Stefanini et al., 2015). Psychological functions are included in "body functions," a component of "client factors" in the OT Practice Framework (AOTA, 2014). Client factors contribute to the outcome of therapy and influence the client's ability to participate in meaningful occupations (AOTA, 2014). Since psychological concerns can impact an individual's ability to participate in occupations, addressing these concerns also falls under the scope of OT practice. In this study, children's engagement and enjoyment was higher when the live dog was present. Furthermore, it was observed that children demonstrated smiles and

initiated interactions with dogs during unstructured time before and after the interventions. These observations and findings are supported by attachment theory, as children's positive relationship with animals can foster security and healthy relationships in addition to emotional regulation and well-being (Sable, 2013; Zilcha-Mano et al., 2011). The inclusion of animals in clinical practice may also provide opportunities for relationship building with the therapist since animals included in therapeutic environments promoted positive rapport between the therapist and the child (McCullough et al., 2018).

The results of this study also indicate that animal-assisted therapy influences the child's volition, an integral component that contributes to an individual's occupational performance ability (Lee & Kielhofner, 2017). While this was not quantitatively measured, it was observed that when the live dog was present, the intervention activities could be graded up to increase the therapeutic challenge. For example, each child performed the same intervention activity with a similar setup between the live dog and stuffed dog conditions, based on his or her physical level of ability. When performing an activity requiring postural stability and balance, one child was unable to maintain balance while standing on balance equipment in the stuffed dog condition, and the activity needed to be graded down through use of a less challenging balance board to promote success. In the live dog condition, the child could participate in the same activity for 10 minutes while maintaining balance on the more challenging balance equipment with little difficulty. This observational finding supports the idea that animal-assisted therapy is motivating for children. The children's volition to interact with animals also supports the idea that incorporating AAT into occupational therapy interventions will promote a client-centered and holistic approach to treatment (Kiraly-Alvarez, 2015).

Conclusion

The pertinent study findings indicate increased enjoyment of the occupational therapy intervention activity and increased engagement with the dog during the live dog condition. This finding provides preliminary evidence that animal-assisted therapy is meaningful and motivating to children. Future studies can build on this research to further explore the role of animal-assisted therapy in occupational therapy practice. While few of the results of the study achieved statistical significance, trends can be observed that indicate that animal-assisted therapy is a valid treatment method that influences the meaningfulness and motivation of children to participate in occupational therapy sessions. This preliminary evidence provides support for the biophilia hypothesis and motivation theory and indicates that children's attraction to and relationship with animals will increase motivation and likelihood of engagement in challenging therapeutic activities.

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