

## Human-Animal Interaction and Metaphor in Equine-Assisted Psychotherapy: Empirical Support for the EAGALA Model

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Research was conducted on equine-assisted psychotherapy and learning (EAP), aimed at identifying and examining process variables. A total of 112 men and women participated in a correlational study, permitting the use of self-report data from EAP sessions within the model of the Equine-Assisted Growth and Learning Association (EAGALA). Human-animal interaction and metaphor were studied as process variables, while subjective distress and psychosocial learning were investigated as outcome variables. Participants reported a range of interactions between humans and horses, and the quantity of human-animal interaction was a significant predictor of reduced subjective distress. Metaphor data indicated horses most often represented family, friends, or feelings. Analyses suggest the relationship between human-animal interaction and psychosocial learning is mediated by the extent to which horses serve as metaphors for people and issues in the client's life, providing empirical support for EAGALA's notion that metaphor is critical to EAP outcomes. Findings are discussed as they relate to developing theory on the role of human-animal interaction in EAP and other animal-assisted therapies.

*Keywords:* Human-Animal Interaction, Equine-Assisted Psychotherapy, EAGALA Model, Metaphor

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Equine-assisted psychotherapy (EAP) is an experiential modality that involves partnering with horses for emotional growth and learning. EAP is typically a collaborative effort by a mental health professional and an equine specialist, working as a team alongside horses to attain client treatment goals (Equine Assisted Growth and Learning Association [EAGALA], 2015). The literature indicates that EAP has been applied frequently with youth and adult populations struggling with a variety of mental health disorders (e.g., Trotter, Chandler, Goodwin-Bond, & Casey, 2008).

While EAP has been used to treat a multitude of psychological problems including emotional and behavioral disorders (Wilkie, Germain, & Theule, 2016), quantitative studies on its effectiveness are scarce (Vidrine, Owen-Smith, & Faulkner., 2002). Many studies that have been conducted are limited by small sample size and a lack of control group comparisons (e.g., Bachi, Terkel, & Teichman, 2011; Trotter et al., 2008). Furthermore, while there are some studies with strong design and promising findings (e.g., Pendry, Smith, & Roeter, 2014), research to date has investigated EAP *outcomes* only. At the time of this writing, the investigation of EAP *processes* has been

minimal. This research aims to elucidate underlying processes to further the development of theory explaining EAP.

### *Need for Empirical Evidence and Theory*

Although EAP investigators have often hypothesized an underlying process, such as horses mirroring (e.g., Symington, 2012) or attuning (Knapp, 2013) to human emotion, there are no published studies directly observing these processes in EAP. Theoretical explanations of equine-related treatments are limited to writings on hippotherapy, also referred to as therapeutic riding. For example, Shumway-Cook and Woollacott (1995) speculate that hippotherapy outcomes can be explained by dynamic systems theory. In this regard, riding is thought to influence sensorimotor, cognitive, respiratory, behavioral, social, and psychological functioning (Casady & Nichols-Larsen, 2004). Kendall, Maujean, Pepping, and Wright (2014) reviewed the literature on therapeutic riding, developing hypotheses to test the psychological benefits of horses. They suggest researchers investigate three possible explanations for therapeutic-riding outcomes – (a) benefits are unrelated to the horses, (b) horses provide a positive context for the primary treatment to occur, or (c) horses have unique therapeutic qualities that bring about changes. Although Kendall et al. focused on riding, the EAP field would benefit from testing these hypotheses on the benefits of horses to psychotherapy.

In reviewing literature on the topic, Kakacek and Ottens (2008) discuss metaphoric communication as integral to the EAP process. Specifically, they state that metaphors are directed at (1) the horse's behavior, (2) props present in the arena/pasture (e.g., halter, gate), (3) lessons taken from solving a problem, and (4) extrapolation of lessons learned in the arena

to life's challenges. These authors discuss horse characteristics as a second mechanism of change in EAP, suggesting characteristics unique to horses allow them to mirror human emotions.

Selby and Smith-Osborne (2013) conducted a systematic review of the literature on biopsychosocial interventions involving horses. They reviewed 103 studies, of which 14 met inclusion criteria. The studies addressed a variety of outcome measures, including self-esteem, locus of control, self-perception, loneliness, and depression. The authors concluded that equine-assisted interventions are promising but more rigorous research is needed. Outcome measures were not discussed in the context of an overall theory on equine-assisted treatments. Similarly, Anestis, Anestis, Zawilinski, Hopkins, and Lilienfeld (2014) conducted a systematic review on equine-related treatments, reviewing 14 empirical studies investigating either equine-related counseling or therapeutic horse riding. The authors found significant problems in the field, including (1) great variability in application of equine-related treatments, (2) an absence of theory explaining the change process, and (3) research limited by multiple threats to internal validity. Thus, they concluded there is a lack of empirical support for EAP and discourage its use until stronger empirical evidence is found. More recently, Lee, Dakin, and McLure (2016) conducted a narrative synthesis of 24 EAP studies from 2005 to 2013. They determined EAP research is limited by nonexperimental research design, incomplete analysis of qualitative findings, and mixing of mounted and non-mounted therapies. They conclude by calling for theory development, particularly in understanding the horse's role in EAP. We address this gap in the literature, examining EAP within the EAGALA model (EAGALA, 2015), as it is an established practice model

which necessitates consistent application of prescribed methods. Furthermore, the model alludes to psychological mechanisms of change underlying practical techniques.

### *EAGALA Model*

EAGALA is a nonprofit organization formed in 1999, providing credentialed training in EAP. Currently, EAGALA has a presence in 50 countries worldwide with over 4,500 professionals working as certified practitioners in the delivery of EAP (EAGALA, 2015). The four tenets of the EAGALA model are that sessions are (1) on the ground (no riding), (2) solution-oriented, (3) facilitated by a mental health professional-equine specialist team, and (4) guided by a code of ethics (EAGALA, 2015). In addition to the four tenets, EAGALA utilizes clean language (Grove & Panzer, 1989) and symbolic modeling (Lawley & Tompkins, 2000) to better facilitate sessions based on client interpretation (Thomas & Lytle, 2016). Notgrass and Pettinelli (2015) provide a detailed description of the EAGALA model, arguing it is different from other modalities involving horses. The model follows the guiding principles of the Association for Experiential Education, and is similar to adventure therapy in its use of activities designed to create therapeutic opportunities and metaphor (Gass, Gillis, & Russell, 2012).

EAP studies specifically addressing the EAGALA model are limited in quantity and scientific rigor. Notgrass (2011) conducted an online survey of EAP practitioners and found that of the 328 respondents, 84.8% followed the EAGALA training model. Schultz, Remick-Barlow, and Robbins (2007) investigated the effects of the EAGALA model on children who had experienced intra-family violence. Global assessment of functioning (GAF) scores improved significantly from pre- to post-

treatment. However, the study design was limited, as there was no control group. Nuremberg et al. (2014) conducted a randomized trial, comparing group treatment with horses (i.e., EAGALA model), dogs (i.e., traditional animal-assisted therapy), no animals, and treatment as usual on aggression in long-term psychiatric patients. Results showed participants receiving the EAGALA model had reduced violence-related incidents in the short term. Nuremberg et al. suggest EAGALA-model outcomes were comparable to the more well-established canine-assisted psychotherapy, and in some cases may have even greater effects. However, their research did not gather process data nor speculate on why working with horses might benefit patients. Exploring variables such as interactions between humans and horses is needed to further our understanding of the EAGALA model and EAP.

### *Human-Animal Interaction*

At the most basic level, EAP involves human-animal interaction (HAI) – clients interact with or are in the presence of horses. However, it is unknown which kinds of interactions occur between humans and horses and which interactions, if any, are related to treatment outcomes. Vitztum (2012) conducted a concept analysis of HAI in general, concluding it is studied as a construct with significant outcomes but without a clear understanding of its crucial ingredient(s). This is a limitation of EAP research as well. Behavioral scientists measure a variety of EAP outcomes, such as psychological symptoms (e.g., Klontz, Bivens, Leinart, & Klontz, 2007) and physiological measures (e.g., Pendry et al., 2014), and they may describe number of sessions and program objectives (e.g., Trotter, et al., 2008), but provide no description or analysis of the ways in which the humans and horses behave with one

another. Instead, interaction is treated as a categorical variable; comparisons are made between clients who receive EAP and those who do not. In other words, EAGALA-model and EAP research generally do not address particular behaviors from the horse or the client, nor do they address the quantity or degree of interaction between the two. Clients are given vague instructions to interpret on their own, to be consistent with the solution-oriented approach (EAGALA, 2015), and sessions are described as having a wide range of interactions, from none at all (e.g., client sits in the pasture and scarcely looks at a horse) to a great deal (e.g., grooming, petting, talking to, haltering and leading a horse) (Thomas & Lytle, 2016). Case stories give the reader a general idea of what can happen between clients and horses, but do not detail which specific behaviors occurred or to what degree they occurred.

In response to the lack of theoretical understanding of HAI, and a suggested need for reliable instruments to examine the construct (Vitzum, 2012; Wilson & Netting, 2012), researchers developed the Human-Animal Interaction Scale (i.e., HAIS), which allows for systematic measurement of behavioral interactions between humans and non-human animals (Fournier, Berry, Letson, & Chanen, 2016; Fournier, Letson, & Berry, 2017). The HAIS was evaluated among several samples and across a variety of animals, and was tested for both validity and reliability (Fournier, Berry, et al., 2016). One purpose of our research was to further our understanding of EAGALA-model and EAP sessions by using the HAIS.

### *Metaphor*

As mentioned above, both EAP (e.g., Kakacek & Ottens, 2008) and the EAGALA model (Notgrass & Pettinelli, 2015) consider the use of metaphor, defined as “a device for seeing something in terms of something else”

(Burke, 1941, p.421), as a necessary component to therapy. A review of the literature shows that metaphor is often discussed as an important component of traditional psychotherapy. Witzum, Van Der Hart, and Friedman (1988) discuss the use of metaphor in psychotherapy, stating it allows language to be “examined as an index of the natural imagistic content of a patient’s thinking” (p. 2). Otto (2000) encourages clinicians to maximize clients’ engagement with and memory of content from sessions through the use of stories and metaphor. Abbatiello (2006) suggests metaphor helps to extend the boundaries of beliefs about thinking, introducing metaphors to the client in cognitive-behavioral therapy as a way of making cognitive distortions more salient.

Regarding therapies involving animals, O’Callaghan (2008) conducted a survey of animal-assisted therapy providers and found that sharing animal stories and metaphors was a technique used by the majority of respondents. Participants who reported using metaphors most commonly stated a purpose of developing insight and building rapport. Esbjörn (2006) surveyed practitioners offering equine-assisted interventions, including the EAGALA model, hippotherapy, and therapeutic riding. Respondents reported horses serving as metaphors for other aspects of clients’ lives as the most important component of the therapy, in addition to providing physical connection and present focus. Similarly, Gilbert (2013) and Lujan (2012) surveyed EAP practitioners. Respondents described metaphor as a key component of EAP and providing metaphors for clients as an important perceived role for horses. Finally, Shultz (2005) stated that horses provide metaphors for important relationships and life challenges when providing a rationale for studying EAP with at-risk youth, yet these statements were not tested empirically. It should be noted that the last four studies are

unpublished dissertations, which discussed metaphor as important to EAP but did not directly measure the construct.

With regard to the EAGALA model, metaphor is described as the “foundation” of the model (EAGALA, 2015, p. 63); it is assumed that metaphors allow a transformation from relating to horses to relating to deeper life issues (i.e., personal growth and learning). This is consistent with the principles of experiential education and adventure therapy. Hovelynck (1998) discusses the facilitator’s role in experiential learning as creating a space for the learner’s life metaphors to emerge, facilitating appreciation for the power of life metaphors, and aiding in the change of restrictive metaphors. Metaphors are described as serving both of these roles in the EAGALA model – introduction of topics/tasks and understanding and changing restrictive patterns in thought and behavior, with the latter taking precedence (EAGALA, 2015; Thomas & Lytle, 2016). Symington (2012) used case examples to illustrate how the EAGALA model and metaphor influence client grief. Specifically, clients identified horses as key subjects in their grief process and worked through grief by working with the horses.

Taken together, the literature suggests metaphor may be a component of psychotherapy in both traditional and animal-assisted modalities; used as a tool for building rapport, remembering and connecting content across sessions, and developing insight. Within the field of EAP, investigators and practitioners have indicated the importance of metaphor use as a therapeutic variable necessary for beneficial client outcomes and progress. Additionally, researchers stipulate that horses in EAP sessions serve as metaphors for the client, family or friends, goals or aspirations, and challenges or losses. However, none of these descriptions have been supported with

empirical evidence. To date, there are no studies involving direct observation and analysis of the function of metaphor in animal-assisted psychotherapy. Despite it being described as a key component of the EAGALA model and EAP, there have been no empirical investigations into metaphor presence or purpose in sessions. The current study serves as an initial attempt to identify the presence of metaphor in sessions following the EAGALA model and examine its relationship with other therapy-relevant variables.

### *Study Design & Hypotheses*

**Design.** Although not yet tested empirically, EAGALA training materials suggest (1) clients engage with horses, (2) life metaphors emerge, and (3) clients gain insight to psychological issues (EAGALA, 2015). This implies a mediation model, in which a mediating variable intervenes in the causal path between cause and effect variables (Baron & Kenny, 1986). In the case of EAP, EAGALA suggests metaphor is a mediating variable between HAI and personal growth and learning. Empirical evidence of this potential mediation is a first step in testing the validity of the EAGALA model as a theoretical and substantive approach to psychotherapy. A mediation analysis was conducted to test the mediating potential of metaphor. Thus, our research was conducted to understand EAP in general and the EAGALA model specifically. Using the EAGALA model, two posttest-only process variables – HAI and metaphor – were measured along with two repeated-measures variables – subjective distress and psychosocial learning. This mixed-methods study included both quantitative and qualitative data.

**Hypotheses.** First, based on research findings that EAP can result in improvements in mood and anxiety (e.g., Beetz, Uvnäs -

Moberg, Julius, & Kotrschal, 2012), it was hypothesized that HAI (i.e., interactions between humans and horses) would be a significant predictor of subjective distress, such that increased HAI would be associated with decreased distress after EAGALA-model sessions. Second, little to no evidence has been collected regarding the relation between specific behaviors (within HAI) and a client's metaphor use. However, we hypothesized that increased HAI overall would be associated with increased metaphor use. Third, we expected that metaphor use would serve as a mediator in the relation between HAI and psychosocial learning.

## Method

### *Participants & Setting*

Participants were 112 male and female adult clients who attended an EAGALA-model session at a private practice in the Midwestern United States. Sessions were held in an arena with one or more live horses, a licensed mental health professional, and an equine specialist, both certified in the EAGALA model. Sessions consisted solely of groundwork (e.g., observing, grooming, leading horses); there were no horse-back riding or mounted activities. Participants were clients of the provider, seeking services for a variety of reasons. Specifically, 47.3% were seeking individual or family psychotherapy (n = 53), 25% underwent group psychotherapy (n = 28), and 27.7% received group experiential learning (n = 31). The data described here are from the participating clients' first EAGALA-model session, occurring between June 2014 and July 2016.

### *Materials*

Materials included self-report measures regularly used by the provider for

assessment and program evaluation, including the Human-Animal Interaction Scale, Subjective Units of Distress Scale, and follow-up questions on Psychosocial Learning and Metaphor created for this study.

***Human-animal interaction scale (HAIS).*** Originally used to measure HAI in the prison setting (Fournier, Geller, & Fortney, 2007; Fournier, 2016), the HAIS is a 24-item paper-and-pencil self-report instrument completed by an individual after interacting with a non-human animal (e.g., animal-assisted therapy/activity session) (Fournier, Berry, et al., 2016; Fournier, Letson, et al., 2017). Respondents rate the extent to which they or the animal engaged in various behaviors on a 5-point Likert scale, ranging from 0, indicating "not at all" to 4, indicating "a great deal." Items ask respondents to report on behaviors emitted by the *human* (e.g., pet the horse, talk to the horse) and behaviors emitted by the *animal* (e.g., make friendly sounds); the scale includes behaviors that may be perceived as *desirable* (e.g., play, groom) or *undesirable* (e.g., decline interaction, behave aggressively). Higher scores indicate a greater quantity of desirable behavioral interaction. Research on the instrument suggests it has adequate reliability and validity (Fournier, Berry, et al., 2016).

***Metaphor self-report.*** Created for this study, participants were administered an item on which to report their experience regarding metaphor. Respondents were asked to rate their level of agreement with the statement "The horses represented something in my life," on a scale from 0 ("not at all") to 10 ("completely"). After rating their agreement, participants wrote an explanation of their rating. From these participant explanations researchers identified and coded thematically similar metaphor use. The prompt was based on (1) EAGALA's suggestion that experiences in the session relate to life issues outside of the session (2)

literature on metaphor in general and metaphor in EAP (e.g., Burke, 1941; Esbjörn, 2006), and (3) observation and pilot testing at the private practice facility.

**Subjective units of distress scale (SUDS).** The SUDS is a Likert scale on which an individual rates their distress from 0-10 (Wolpe, 1990). The SUDS is established as a valid measure of distress when treating anxiety disorders (e.g., Kaplan, Smith, & Coons, 1995) and is often used to determine progress in therapy (e.g., Rothbaum, Astin, & Marsteller, 2005). In this study, participants rated current mood and anxiety, each on a 0-10 scale, where 0 indicated “none” and 10 indicated “worst ever.” Scores were combined for an overall score of subjective distress, ranging from 0-20.

**Psychosocial learning self-report.** Similar to the metaphor self-report, respondents were asked a question designed to assess psychosocial learning. Using the 0-10 scale, participants rated their agreement with the statement, “I learned something about myself,” and wrote comments to explain their rating. These participant comments were examined for common learning themes and then coded for tabulation. This item was written to gather broad intrapersonal data, developed from observation and pilot testing, showing clients report learning a wide array of content about themselves (e.g., thought and behavior patterns) in EAGALA sessions.

### *Procedure<sup>1</sup>*

Research procedures consisted of analysis of de-identified data from a convenience sample of EAGALA-model clients. When consenting to services, clients

of the provider could also consent to have data from self-report measures used in research at the aggregate level. Agreeing to the research was voluntary; clients were informed their decision would have no impact on their services. Data from clients who consented to the use of aggregate data for research were entered into a de-identified database, which was saved and stored separately from client treatment records. The research examined this de-identified data only, which included scores from the above self-report measures; diagnostic, treatment, and demographic information were excluded. Sessions included one or more horses from a herd of nine horses housed at the provider facility. The research did not involve any changes to horse care, nutrition, or management.

Clients were administered the SUDS scale before and after each session, rating both mood and anxiety on a 10-point scale. After the session, clients reported interactions with the horses on the HAIS, and also completed the Metaphor and Psychosocial Learning self-reports. These administrations were part of regular practice by the provider and their use was not dependent on research participation. Clients had the right to decline the measures. The data presented here are from adult clients who attended a session, completed the self-report measures, and consented to their data being used in research.

### **Results**

During the research period, services were provided to a total of 120 clients. Of those, 1.7% (n = 2) declined to complete the self-report measures and 5.0% (n = 6) of those who completed measures declined to

<sup>1</sup> All procedures were reviewed and approved by an institutional review board, in accordance with the U.S. Department of Health and Human Services – Federal Policy for the Protection of Human Subjects,

45 Code of Federal Regulations Part 46. Procedures were also reviewed and approved by the institutional animal care and use committee, in accordance with the animal welfare act.

**Table 1.** Self-Reported Interactions between Humans and Horses (N = 112)

	HAIS Item	Mean (SD)	Percent Reporting (%)					≥1 (%)
			0	1	2	3	4	
Human Behavior toward Horse(s)	Watch	3.11 (0.89)	0.0	1.8	27.7	25.9	42.0	100.0
	<b>Spend time near**</b>	3.13 (1.08)	4.0	2.0	21.2	22.2	50.5	98.2
	<b>Pet**</b>	2.82 (1.06)	1.8	10.0	25.5	30.0	32.7	96.0
	<b>Talk to**</b>	2.24 (1.26)	7.3	22.7	34.5	10.0	25.5	93.7
	<b>Play with**</b>	1.56 (1.14)	21.3	28.9	31.3	10.2	8.3	78.7
	<b>Hold*</b>	0.84 (1.10)	53.2	27.3	9.3	4.6	5.6	63.6
	<b>Hug*</b>	1.14 (1.36)	47.3	20.0	14.5	8.2	10.0	52.7
	Kiss	0.55 (0.91)	56.8	30.2	7.4	2.8	2.8	47.3
	<b>Groom*</b>	1.53 (1.46)	36.4	17.3	18.2	13.6	14.5	46.8
	Offer food to	0.60 (0.91)	61.3	25.8	8.3	0.9	3.7	43.2
	<b>Try tricks/training*</b>	0.96 (1.25)	52.7	18.2	15.5	7.3	6.4	38.7
	Take pictures	0.27 (0.59)	71.3	24.1	2.8	0.9	0.9	31.3
	<b>Decline interaction**</b>	0.31 (0.59)	73.0	23.3	1.9	0.9	0.9	28.7
	Behave aggressively	0.06 (0.17)	68.7	31.3	0.0	0.0	0.0	27.0
	Horse Behavior toward Human	<b>Initiate interaction**</b>	2.44 (0.81)	1.9	6.5	43.5	36.1	12.0
<b>Friendly sounds*</b>		1.75 (0.94)	13.1	19.4	52.6	10.3	4.7	93.5
Accept food		0.34 (0.72)	67.1	27.4	0.9	3.7	0.9	86.9
<b>Play*</b>		1.13 (1.02)	31.8	37.1	21.80	5.6	3.7	86.9
Obey tricks/training		1.26 (1.03)	29.0	30.0	30.8	6.5	3.7	71.0
Sniff		2.11 (1.03)	6.5	17.6	44.4	21.3	10.2	68.2
Lick		0.36 (0.72)	72.8	20.7	3.7	0.9	1.9	39.8
Decline interaction		0.36 (0.72)	13.1	39.4	37.2	8.4	1.9	32.9
Unfriendly sounds		0.44 (0.64)	60.2	31.5	13.0	6.5	1.9	37.2
Mess or inconvenience		0.22 (0.49)	82.8	14.4	0.9	1.9	0.0	33.9
Behave aggressively	0.27 (0.48)	76.1	21.1	1.9	0.9	0.0	18.2	

Note. Items in bold correlate significantly with posttest distress. \* $p < .01$ , \*\* $p < .001$

Responses on the HAIS can range from 0, indicating “not at all” to 4, indicating “a great deal.”

have their scores used in research. Thus, the total sample was 112, including 76.8% women ( $n = 86$ ) and 23.2% men ( $n = 26$ ). This gender ratio is consistent with the demographics of this specific facility. Although participants may have attended more than one session, for consistency their participation in this study was limited to self-report data from the first session only.

### Human-Animal Interaction

**Descriptives.** Table 1 provides mean scores on the HAIS, including individual items, subtotals, and the overall total. Participants reported the full range of behaviors, with all items endorsed by at least one participant. The table also provides the percentage of participants endorsing each of

the 0-4 ratings, and the percentage of participants who rated the item 1 or higher. Taken together, the information in Table 1 reflects the variability between items, with some behaviors rated much higher (e.g., Watch, Spend Time Near) than others (e.g., Kiss, Take Pictures). While there are no cut-off scores on the HAIS, higher scores reflect a greater quantity of positive behavioral interaction between the human and horse(s). Total scores, including behaviors emitted by humans and horses, ranged from -1 to 63, with a mean of 25.6 ( $SD = 12.4$ ), a median of 24, and a mode of 32. A negative score indicates there were higher ratings on undesirable behaviors (e.g., Decline Interaction, Make Unfriendly Sounds) than desirable behaviors (e.g., Pet, Groom, Offer Food). There was just one negative score



(i.e., -1), from a participant who reported some approach behaviors from the horses but declined or avoided any interaction with the horses.

In addition to total scores, the HAIS provides a human-behavior subtotal and horse-behavior subtotal. Similar to the total score, there was great variability within these subtotals. Human-behavior scores ranged from -2 to 45 ( $M = 18.78$ ,  $SD = 8.63$ ) and horse-behavior scores ranged from -2 to 22 ( $M = 6.94$ ,  $SD = 4.01$ ). Watching the horse(s) was the highest rated human behavior ( $M = 3.13$ ,  $SD = 0.89$ ) and Initiating Interaction with the human(s) was the highest rated horse behavior ( $M = 2.44$ ,  $SD = 0.81$ ). For both humans and horses, desirable behaviors were rated much higher than undesirable behaviors. Ratings on Aggressive Behavior and Declining or Avoiding Interaction were among the lowest for both subscales.

**Subjective distress.** Participants rated their distress before and after each session.

Paired-samples  $t$ -tests indicated distress decreased from pretest ( $M = 7.42$ ,  $SD = 3.75$ ) to posttest ( $M = 3.58$ ,  $SD = 3.55$ ),  $t(92) = 9.39$ ,  $p < .001$ . To determine whether there was a relationship between subjective distress and interactions with the horses, Pearson  $r$  correlations were calculated between SUDS scores and HAIS scores. Table 2 shows the correlation matrix for calculations between HAI and other variables. There were negative correlations between posttest distress and human behavior,  $r(92) = -.443$ ,  $p < .001$ , horse behavior,  $r(91) = -.294$ ,  $p = .005$ , and total HAI,  $r(92) = -.405$ ,  $p < .001$ . These correlations were not present at pretest,  $p$ 's  $> .05$ . To test the hypothesis that HAI would predict EAP outcomes, a simple linear regression was calculated. A significant regression equation was found for total HAI to predict distress,  $F(1, 90) = 17.64$ ,  $p < .001$ ,  $R = .164$ , explaining 15.5% of the variance.

**Table 2.** Correlation Matrix on HAI, Distress, Metaphor, and Psychosocial Learning ( $N = 112$ )

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. HAI	-								
2. Human HAI	.96**	-							
3. Animal HAI	.86**	.69**	-						
4. Anxiety (Pre)	.04	.03	-.01	-					
5. Anxiety (Post)	-.33**	-.39**	-.15	.38**	-				
6. Mood (Pre)	-.14	-.10	-.12	.40**	.09	-			
7. Mood (Post)	-.33**	-.33**	-.31**	.28**	.66**	.38**	-		
8. Metaphor	.34**	.36**	.22*	.03	-.33**	-.05	-.36**	-	
9. Psychosocial Learning	.41**	.39**	.29**	-.03	-.38**	-.16	-.43**	.80**	-

\* $p < .01$ , \*\* $p < .001$

To examine the predictive power of human behavior versus horse behavior, a multiple regression model was calculated on distress, with human and horse behavior entered as predictors. Several analyses were carried out to determine whether required assumptions were met. An analysis of

standard residuals identified three participants as outliers; the participants were removed from the analysis. Tests of collinearity indicated that multicollinearity was not a concern (human behavior tolerance = .52, VIF = 1.93; horse behavior tolerance = .52, VIF = 1.93). The Durban-Watson test

indicated the data met the assumption of independent errors (1.92), and the histogram and P-P Plot indicated the data met the assumption of normally distributed residuals. The scatterplot of standardized predicted values showed that the data met the assumptions of homogeneity of variance and linearity. Finally, the data met the assumption of non-zero variances (human behavior = 73.68; horse behavior = 16.73; distress = 9.13). Using the enter method, it was found that human and horse behavior explained a significant amount of the variance in distress scores,  $F(2, 83) = 7.75, p = .001$ . The analysis showed that human behavior was a significant predictor of posttest distress ( $\beta = -.39, t(83) = -2.82, p = .006$ ), but horse behavior was not ( $\beta = -.01, t(83) = -.03, p = .98$ ).

**Psychosocial learning.** Participants rated the extent to which they agreed with a statement that they had learned something about themselves, and then were invited to write comments explaining their answer. A total of 90 participants rated their agreement. Ratings ranged from 0 to 10, with a mean of 5.74 ( $SD = 3.49$ ). Pearson  $r$  correlations were calculated between scores on the HAIS and psychosocial learning ratings, shown in Table 2. There were significant correlations between learning and human behavior,  $r(81) = .39, p < .001$ ; horse behavior,  $r(88) = .29, p = .006$ ; and total HAI  $r(81) = .41, p < .001$ . Simple linear regression resulted in a significant equation, where HAI explained 15.9% of the variance in psychosocial learning,  $F(1, 76) = 15.51, p < .001, R = .41$ . Similar to analyses on subjective distress, a multiple regression analysis was calculated,

assessing human behavior and horse behavior as predictors of learning. The data met all necessary assumptions for the analysis. Using the enter method, it was found that the regression equation was significant,  $F(2, 73) = 7.23, p = .001, R = .41$ , explaining 14.2% of the variance in learning. Similar to the findings on distress, results showed that human behavior was a significant predictor of psychosocial learning ( $\beta = .32, t(75) = 2.32, p = .023$ ), but horse behavior was not ( $\beta = -.11, t(75) = 0.81, p = .42$ ).

When asked to explain their ratings on the psychosocial learning self-report, 64.4% of the 90 participants ( $n = 58$ ) provided written comments. These comments were analyzed for themes following the constant comparative method (Brunner, 2004). To increase the reliability of the findings, the researchers inductively drew themes, then discussed the themes until reaching agreement concerning the importance of each theme and its conclusion. Once a distinct number of themes was identified, researchers rated the written responses, categorizing each response as fitting one of the themes. All the comments were rated by two researchers who rated independently of one another; percent agreement between raters was 88%. Participant responses fell within six themes. Table 3 provides the list of themes that emerged, in order of frequency, as well as an example comment for each theme. Although no predictions were made, one-way ANOVAs were calculated to explore whether HAI or subjective distress differed across the learning themes. There were no significant differences,  $p's > .05$ .

**Table 3.** Themes and Examples from Qualitative Data ( $n = 58$ )

Theme	%	$n$	Example
<b>Psychosocial Learning</b>			
Strengths/Weaknesses	34.0	18	"I am strong, and can be ok"
Relationship Awareness	28.3	15	"I struggle meeting new people; trust takes time"
Emotional Awareness	17.0	9	"I'm terrified"

Acknowledgement/Acceptance	9.4	5	<i>"I can overcome anything"</i>
Goals/Interests	7.5	4	<i>"I need to learn to let go"</i>
<b>Horse Metaphor</b>			
Feeling or State	28.1	16	<i>"that horse is my anxiety"</i>
Family or Friends	19.3	11	<i>"the people I need to trust"</i>
Relationship Constructs	14.0	8	<i>"interactions with others, communication, trust"</i>
Lesson	12.3	7	<i>"pushing leads to resistance"</i>
Self	10.5	6	<i>"it's me in my vulnerable stage"</i>
Challenge	8.8	5	<i>"the white horse is struggles in my life"</i>

Comparisons were made between participants who did ( $n = 58$ ) and did not ( $n = 32$ ) write comments explaining their ratings. A One-way ANOVA showed that participants who wrote comments about learning rated their agreement with the statement on learning higher ( $M = 6.35$ ,  $SD = 3.10$ ) than those who did not comment ( $M = 4.89$ ,  $SD = 3.92$ ),  $F(1, 84) = 3.72$ ,  $p = .05$ . The presence of written comments was not dependent on any other variables (i.e., HAI, subjective distress, metaphor),  $p$ 's  $> .05$ .

### Metaphor

Participants rated the extent to which the horses represented something in their life, then wrote comments explaining their ratings. The ratings and comments were summarized and tested for associations with HAI and psychosocial learning.

**Descriptives.** Of the 112 participants, 86.6% ( $n = 97$ ) rated the extent to which the horse(s) represented something in their life. The ratings for these horse metaphors ranged from 0 to 10, ( $M = 6.02$ ,  $SD = 3.10$ ). When asked to explain their ratings on the metaphor self-report, 59.8% of the 97 participants ( $n = 58$ ) provided written comments. Horses represented a feeling or state, family or friends, a relationship or relationship construct (e.g., trust), challenges or barriers, life lessons, and themselves. A small number of respondents ( $n = 4$ ) provided a concrete description of the session rather than

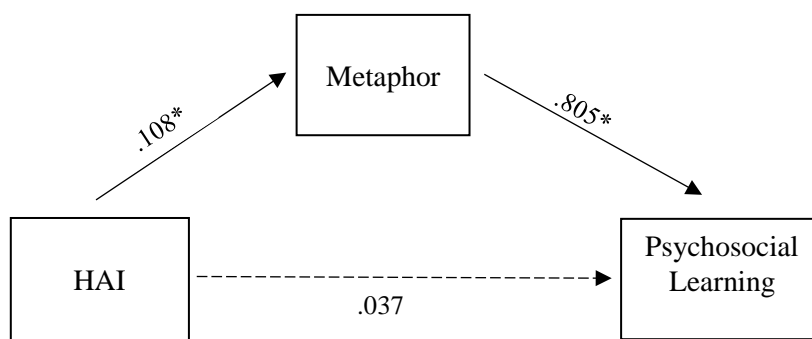
describing a metaphor. Referring again to Table 3, the most common metaphor was horses representing a feeling or state, with 28.1% of participants reporting in that category. To explore whether horse metaphor was related to other variables, one-way ANOVAs were calculated, comparing posttest distress, HAI, and psychosocial learning across the five metaphor themes. There were no significant differences found,  $p$ 's  $> .05$ .

Similar to the data on psychosocial learning, comparisons were made between participants who did and did not write comments explaining their ratings on the metaphor self-report. A One-way ANOVA showed that participants who wrote comments about horses as metaphors rated their agreement with the statement on horse metaphor higher ( $M = 7.29$ ,  $SD = 2.39$ ) than those who did not comment ( $M = 4.88$ ,  $SD = 3.67$ ),  $F(1, 90) = 14.54$ ,  $p < .001$ . The presence of comments was not dependent on any other variables (i.e., HAI, subjective distress, metaphor),  $p$ 's  $> .05$ .

**Mediation.** To test the hypothesis that increased HAI would be associated with increased metaphor use, correlations were calculated between HAI scores and metaphor ratings. As shown in Table 2, there was a positive correlation between HAI and metaphor; this was true for human behavior, horse behavior, and total HAI. A mediation analysis was conducted, examining the relationship between HAI, metaphor, and

psychosocial learning. In Step 1 of the mediation model, the regression of HAI on learning, ignoring the mediator, was significant,  $b = .120$ ,  $t(77) = 3.91$ ,  $p < .001$ . Step 2 showed that the regression of HAI on the mediator, horse metaphor, was also significant,  $b = .108$ ,  $t(77) = 3.66$ ,  $p < .001$ . Step 3 of the mediation process showed that the mediator (horse metaphor), controlling for HAI, was significant,  $b = .805$ ,  $t(77) = 9.66$ ,  $p < .001$ . Step 4 of the analysis revealed

that, controlling for the mediator (horse metaphor), HAI was not a significant predictor of learning,  $b = .037$ ,  $t(77) = 1.62$ ,  $p = .109$ . A Sobel test was conducted and found full mediation in the model ( $z = 3.41$ ,  $p < .001$ ). Thus, it was found that horse metaphor mediated the relationship between HAI and psychosocial learning. Figure 1 illustrates the mediation, each path labeled with regression coefficients.



**Figure 1.** Standardized coefficients showing metaphor mediating the relationship between HAI and psychosocial learning. Solid lines indicate significant paths; dotted lines indicate nonsignificant paths. \* $p < .001$

## Discussion

The purpose of the present study was to further our understanding of EAP, providing empirical evidence of two process variables – HAI and metaphor – and their effects on EAP outcome. More specifically, the EAGALA model was examined, testing the assumption that metaphor is a key component of the process. HAI was measured, providing a first look at the actual behaviors that occur in psychotherapy with horses. Clients reported a range of behaviors occurring between them and horses, with variability between respondents. While each item on the HAI was endorsed by at least one participant, some behaviors were rated much higher than others. This variability is consistent with case stories depicting a

variety of interactions during EAGALA-model sessions (Thomas & Lytle, 2016) and provides a more objective description of EAP interactions (Fournier, Berry et al., 2016). For both humans and horses, desirable behaviors were much more prevalent than undesirable behaviors. Regression analysis showed that the overall quantity of reported interactions was correlated with decreased subjective distress (i.e., mood and anxiety states).

Data supported the hypothesis that HAI scores would predict subjective distress, suggesting the quantity of behavioral interactions between humans and horses has an impact on the outcomes of EAGALA-model-based treatment. The absence of a correlation between pretest distress and HAI, coupled with the

correlation with posttest scores, warrants further experimental research testing a potential cause and effect relationship. Regression analyses indicated that HAI was a significant predictor of subjective distress and psychosocial learning. In both cases, when entering both human behavior and horse behavior into the equation, human behavior was a significant predictor but horse behavior was not. This pattern should be explored further, as it is important for an understanding of the EAGALA model and EAP, and may reflect nuances in the effects of HAI and therapeutic outcomes of animal-assisted therapies.

Metaphor was explored as a second process variable, as it is described as a critical component in the EAGALA model (EAGALA, 2015; Thomas & Lytle, 2016). To date, the literature discusses the use of metaphor in psychotherapy (e.g., Schoo, 2009; Witzum et al., 1988) and the prevalence of animal metaphors in society (e.g., Palmatier, 1995). Empirical investigations of metaphor have focused on their use to describe humans, categorized as positive or negative (e.g., Goatly, 2006; Sommer & Sommer, 2011). Writings on metaphor in psychotherapy discuss its function in facilitating the therapeutic process (e.g., Abbateillo, 2006), but have not measured their salience or meaning for the client. Metaphor was measured here via client ratings and reports on whether the horses in the session represented something in their life. The data confirmed that metaphors do emerge during sessions. Although literary investigations into animal metaphors tend to find that metaphors describing humans as animal or animal-like are negative or pejorative (Goatly, 2006; Sommer & Sommer, 2011), participant comments on horse metaphor show the opposite. When horses were reported as representing humans (i.e., family or friends), comparing the person to a horse was not a

way of disparaging the target. Instead, statements on horses representing humans illustrated the target's relationship to the client or role in their life. The horse provided a vehicle for understanding and interacting with the target in a kind of emotional simulation.

Clients saw horses as a variety of representations, including a feeling or state, family or friends, relationships, lessons, or challenges. This is consistent with previous research, which found horses as metaphors for relationships, family members, and challenges (Esbjörn, 2006; Shultz, 2005; Symington, 2012). Analyses indicated the relationship between HAI and psychosocial learning was mediated by metaphor, providing the first empirical evidence supporting EAGALA's assertion that metaphor is a key variable in the EAGALA model (e.g., EAGALA, 2015; Thomas & Lytle, 2016). Combined with results on subjective distress, the findings suggest HAI may have direct effects on EAP outcomes (i.e., decreased distress, improved mood and anxiety), as well as indirect effects via influencing the therapy's mechanisms of change (e.g., metaphor).

There were no differences in psychosocial learning between the different metaphor themes. For example, people who identified horses as representing their family and friends did not report any greater or lesser learning than those for whom a horse represented a feeling. However, metaphor ratings (i.e., the degree to which the horse represented something in their life) were strongly related to learning, fully mediating the relationship between HAI and learning. This is consistent with EAGALA's suggestion that it's the client's interpretation of what happens in the arena, rather than what any observer may perceive to have happened, that leads to personal growth and learning (EAGALA, 2015), and suggests there is not a specific kind or quantity of human-horse

interaction necessary for specified outcomes. Rather, interacting with the horses provides an experience within which therapeutic issues arise and can be addressed.

### Limitations

Results must be considered within the context of several limitations. Findings on metaphor and learning relied in part on written comments, which were not completed by all participants. Respondents self-selected whether to write comments, leaving this data vulnerable to participant bias. Analyses suggest the decision to write a comment or not was related to their agreement with the statement, and perhaps to the degree to which they actually experienced metaphor and psychosocial learning. For both variables, participants who commented reported higher ratings than those who did not. It is possible that an individual who does not perceive to have learned something about themselves would then have little if anything to write about. Similarly, if the horses did not represent something in their life, they would have less to write about than someone for whom the horses did serve as a metaphor. However, ratings spanned the full range (0-10) for both participants who did and did not comment; this was true for metaphor and learning. Although the response rate was substantial, (59.8% for metaphor, 64.4% for learning), methods to increase the number of participants providing written comments would improve future studies, confirming whether metaphors emerge during session and are related to psychosocial learning for all clients.

A second limitation lies in the way metaphor data were elicited – via directive statements. Clients were asked whether the horses represented something in their life, but unsolicited reports of metaphor may be even more important to study. EAGALA training materials state that anything in the pasture or

arena (e.g., landscape, gate, rope, props) can serve as a vehicle for connecting to the client's internal world (EAGALA, 2015). Thus, asking directly about the horses may have focused a client's attention away from a more important metaphor for them (e.g., the gate to the pasture as entrance into the unknown). This may explain why there were no differences in psychosocial learning between different horse representations. Perhaps the metaphor that really impacted their process was not detected by the methods used here. Future investigations might benefit from exploring metaphors beyond the horses, in a nondirective manner.

Results are limited by the correlational nature of the study. While analyses indicate significant relationships between variables, experimental methods are needed to confirm the causal pathways depicted in Figure 1. In addition, this research should be extended through replication using alternative measures of distress, metaphor, and learning. There are a variety of instruments available to measure mood and anxiety states, such as the profile of mood states (McNair, Lorr, & Droppleman, 1971) or the positive and negative affect schedule (Watson, Clark, & Tellegan, 1988), but metaphor measurement is more challenging. The measures of metaphor and learning used here are new instruments not yet validated or normed. They were used because of a lack of appropriate existing measures. While there are tests of one's ability to create metaphor from verbal stimuli (e.g., Primi et al., 2006) and taxonomies for categorizing metaphors to determine author style (e.g., Crisp, Heywood, & Steen, 2002), there are no standardized instruments or methods to measure metaphor as was done here. Refinement and validation of the metaphor self-report may be valuable for further study of metaphor as a process variable in EAP and other forms of psychotherapy.

These data are from participants' first EAGALA session only. Although this was intentional, to ensure consistency, it is unknown how the findings would compare if taken from multiple sessions. Important questions to be addressed in future research are whether the same metaphor is addressed throughout a multiple-session treatment regimen and whether the relationship between HAI, metaphor, and learning is affected by length of treatment. Finally, this research was limited to a relatively small convenience sample and thus replication with a larger, random sample is recommended.

## Conclusion

Equine-assisted psychotherapy (EAP) programs are increasing in number (McConnell, 2010) and scientists are calling for better research on outcomes as well as theoretical explanations for those outcomes (e.g., Anestis et al., 2014). The findings examined here provide substance for development of theory, connecting process and outcome variables within the EAGALA model. Further research is needed to replicate and extend these findings. Should the process variables of HAI and metaphor withstand further scrutiny, their utility in explaining other animal-assisted therapies must be

explored. Indirect effects of HAI occurred through metaphor, a purportedly key mechanism of the EAGALA model. It is important to gather empirical evidence of other EAP methods and determine whether HAI functions similarly, providing direct and indirect effects via mechanisms of change specific to that method.

More broadly, the field of HAI is in need of theory to explain findings and guide more rigorous research (Wilson & Barker, 2003). It is important to know if direct and indirect effects of HAI are unique to the EAGALA model and EAP or whether the same principles apply to psychotherapy with other species. It is crucial that we determine whether it is the technique used (e.g., EAGALA model, PATH), the animal involved (e.g., horses, dogs), some interaction between these variables, or some other variable(s) altogether that lead to positive outcomes. The research on EAP and other animal-assisted therapies is largely applied in the field, evaluating the outcomes of various programs involving horses and other animals. EAP research would benefit from more basic research, wherein variables are randomized and tested on healthy individuals first, then extended to clinical populations as appropriate.

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