

Ponies Proliferate Positive Affect: The Effectiveness of Equine Therapy on Positive
Affect in Adolescents with Serious Emotional Disturbances

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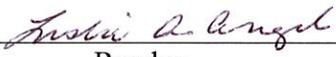
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Abstract

Adolescents with serious emotional disturbances (SED) are a particularly difficult population to treat due to high comorbidity rates of anxiety, depression, post-traumatic stress, and behavioral conduct disorders. The current study compared the effectiveness of equine-facilitated psychotherapy (EFP) and traditional group therapy (TGT) on measurements of positive affect (PA) and negative affect (NA) in SED adolescents. This study hypothesized that participants would have higher overall affect after EFP compared to TGT and that NA would be significantly lower after EFP compared to TGT.

Adolescents admitted in therapeutic youth group home treatment participated in EFP and TGT sessions once a week over an eight week period in addition to normative treatment. The Positive and Negative Affect Scale (PANAS) questionnaire was administered immediately before and after EFP and TGT sessions. Statistical analyses supported the hypothesis that participants would have higher overall affect after EFP but there were no significant differences in NA before and after EFP. Further analyses revealed that EFP was just as effective as TGT in increasing PA and decreasing NA. More importantly, participants had significantly higher PA before and after EFP compared to TGT. Even though PA scores improved in both therapies, participants arrived to and left EFP with significantly higher PA scores than TGT. Due to its unique effect on PA, EFP could be a more engaging and effective therapy for SED clients compared to traditional therapeutic techniques.

Ponies Proliferate Positive Affect: The Effectiveness of Equine Therapy on Positive Affect in Adolescents with Serious Emotional Disturbances

Serious emotional disturbances (SED) are a rising mental health epidemic among adolescents (Brauner & Stephens, 2006). Individuals diagnosed with SEDs are adolescents with multiple mental health diagnoses such as anxiety, depression, and conduct disorders. Without proper treatment, SED individuals are more likely to drop out of high school, have higher unemployment rates, and are more likely to be arrested (Wagner, 1995). Not only are SEDs becoming more common among adolescents, but SEDs are also difficult to treat. SED individuals often have below average social, mental, and behavioral functioning (Brauner & Stephens, 2006). These social, mental, and behavioral deficits often make treating SED clients extremely difficult due to their low levels of functioning (Roberts, Jacobs, Puddy, Nyre, & Vernberg, 2003). SED patients are also likely to resist treatment or work poorly with mental health professionals. Therapists must create engaging therapeutic environments such as play therapy in order to improve SED patients' participation in therapy. Equine-facilitated psychotherapy (EFP) offers a unique and engaging therapeutic environment that could benefit SED clients. EFP has been shown to increase clients' participation in therapy while using horses (EAGALA, 2009). The engaging, nonjudgmental environment that EFP provides might create more effective SED treatment. A combination of both structured equine and traditional group therapy could provide SED clients with the necessary engaging and structured therapeutic environment to best facilitate psychological improvements.

The American Psychiatric Association (APA, 2013) states four diagnostic criterion for SED. Firstly, the individual must be under eighteen years old (APA, 2013).

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Secondly, they must have a primary diagnosable condition such as bipolar disorder, depression, anxiety, schizophrenia, or other diagnoses. Thirdly, the disorder must impair their ability to function in areas such as: self-care, social abilities, communication, school, and cognitive abilities (APA, 2013). Finally, the individual must experience distressing symptoms for six months or longer (APA, 2013). A majority of SED individuals struggle in school due to comorbid learning disabilities and difficulty focusing (Roberts et al., 2003). Additionally, SED causes daily difficulties maintaining social relationships due to mercurial mood swings and incongruous social behaviors (Roberts et al., 2003).

The population in this study had high rates of trauma and stressor related disorders in addition to conduct related, depressive, neurodevelopmental, substance use, anxiety, and paraphilic disorders. Many of the participants' multiple disorders negatively impacted their daily lives. For example, several participants with PTSD and defiance disorders acted out in school and at home. Many participants were implicated in legal issues relating to physical violence, stealing, or substance use. Likewise, many participants were considered highly sexualized. In these cases, the participants were either sexually abused, committed a sexual offense or experienced both.

Treating SED individuals remains a complex and not entirely effective task (Roberts et al., 2003). Since SED patients can have an extremely wide range of symptoms and comorbid disorders, generally a multimodal therapeutic treatment approach is used (Roberts et al., 2003; Huffine, 2002). Methods such as talk therapy, CBT, family therapy, and medication interventions have been used to treat SED clients (Roberts et al., 2003). The difficulty in treating SED patients is due to high treatment

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dropout rates of 40-60 percent and lack of client participation during therapy (March & Fristad, 2002). EFP could act as a diverse and engaging therapeutic method to effectively treat SED.

SED adolescents require a multisystemic treatment approach including aspects of group therapy which offers beneficial but potentially harmful effects (Henggeler, 2002). Group therapy provides adolescents with the unique opportunity to relate to their peers with similar struggles, improve social skills, gain social support, and receive valued feedback from peers (Kern, 2011). Clarke et al. (1990) found that group therapy significantly benefitted adolescents more than adults suffering from depression. Adolescents might benefit more from group therapy than adults because social peers are more valued during adolescent development (Kern, 2011). Likewise, a meta-analysis revealed that group therapy was more effective than control groups with diverse participants ranging in age and diagnosis (Hoag & Burlingame, 1997). Its success in treating diverse populations might make group therapy a more effective treatment for erratic SED clients. Overall and long term benefits of group therapy can be explained through clients modeling each other's healthy behaviors, experiencing social acceptance, and gaining long term peer support (Asbahr et al., 2005). But group therapy involves countless dynamics that can become problematic.

Group therapy poses as many potential hazards as it does healthy benefits. Clarke et al. (1990) emphasizes the importance of healthy coherence or harmony within each group. Unfortunately, the simple act of adding a new client to the group can encumber group progress. Adolescents value their peers' opinions (Kern, 2011), but this also leaves them subject to peer pressure (Wayman, 2013). If unhealthy group think mentality

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consumes the group, it can be therapeutically harmful to clients. For example, group therapy was not effective in treating drug addictions because the group was possibly too triggering and clients had the potential to share different substance abuse techniques with each other (Wayman, 2013). SED clients might be especially sensitive to group therapy due to their fractious behaviors. Group therapy dynamics are extremely sensitive and require an effective tool to buffer harmful group think. Incorporating horses into group therapy could serve as a buffer to ease the social dynamics and encourage constructive teamwork within the group.

EFP is defined as a dynamic interaction between patient, mental health professional, and equine as therapeutic treatment for a diagnosed illness (Professional Association of Therapeutic Horsemanship, 2015). Fine (2010) highlights several necessary characteristics that distinguish EFP from recreational equine activities. Characteristics include the presence of a health professional and an organized treatment plan designed to treat a diagnosed illness. A health professional qualifies as a licensed doctor, therapist, psychiatrist, or any form of licensed mental health professional. Fine (2010) also emphasizes the requirement of having a skilled equine specialist present to ensure safety for both people and horses. Furthermore, EFP must be treatment oriented (Fine, 2010). Each session has a specific therapeutic goal in mind. For example, a therapist working with a client who struggles setting boundaries with family members might have the client practice setting physical boundaries with the horse. All of the mentioned characteristics distinguish EFP from recreational equine activities. These characteristics also make EFP unique from traditional therapeutic methods. Not only does EFP incorporate the interaction between client and therapist but the horse enhances the

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dynamic interaction by acting as a buffer and spontaneous therapeutic catalyst which provides unique benefits and concerns with EFP treatment (EAGALA, 2009).

EFP offers many unique features that traditional therapeutic methods lack. The environment, presence of the horse, and interactive process are especially distinctive to EFP. An open environment can allow clients to feel more comfortable and less intimidated by therapy (EAGALA, 2009). In turn, clients might be more likely to actively participate in therapy (EAGALA, 2009). Likewise, horses' large size and powerful presence can evoke strong emotions in clients (Kirby, 2010). For example, handling horses has shown to increase patients' confidence and sense of capability by working with such large, responsive animals (EAGALA, 2009). Mandrell (2009) highlights that horses, as herd animals, have a keen social awareness. This allows horses to provide people with immediate feedback in social situations (Mandrell, 2009). The horses' extreme sensitivity to emotions makes clients more aware and mindful of their feelings (Kirby, 2010). Human-horse interactions differ from human-human interactions because the horse's guileless reactions (Kirby, 2010). Within the EFP field, there are various methods to direct sessions. One such example is Trauma Informed Equine-Facilitated Psychotherapy (TI-EFP).

TI-EFP is a therapeutic method that focuses specifically on improving trauma symptoms while working with horses. The TI-EFP model "utilizes horse physiology to regulate human physiology, and horse psychology to heal human psychology" (Natural Lifemanship, n.d.). Through mounted and unmounted work with the horses, clients learn to build trusting relationships, regulate emotions, and reform traumatic associations. TI-EFP follows a similar structure to Trauma-Focused CBT (TF-CBT). The model includes

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traditional TF-CBT aspects of psychoeducation, coping strategies, emotional regulation, cognitive processing, and behavioral management, but also incorporates horses into the process. Working with horses enhances the effectiveness of TI-EFP by allowing clients to build genuine relations with the horses and through physiological benefits produced by therapeutically riding horses (Kruger, 2012). The horses' extreme sensitivity to human emotions improves clients' ability to identify and regulate their own emotions (Chandler, 2005). Additionally, breathing techniques and mindfulness exercises while riding the horses also provides unique physiological benefits. Being able to successfully work with a horse actually releases dopamine within the brain (Chandler, 2005). With repetitive successful interactions, the client is able to form positive neural associations within the human-horse relationship and transfer those positive associations to human-human relationships (Kruger, 2012). The horses' rhythmic and repetitive motion aid in forming new neural associations related to stress (Kruger, 2012). For example, riding a horse can be very stress provoking. TI-EFP allows clinicians to put clients in a stressful, but controlled, environment in order to help clients work through states of elevated anxiety and apply it to their everyday lives (Ewing, MacDonald, Taylor, & Bowers, 2007). While a client is riding the horse the therapist might have them do breathing exercises in rhythm to the horse's movement. This aids in reducing stress, improving coping skills, and develops stronger emotional regulation (Kruger, 2012). TI-EFP offers clients unique benefits that cannot be accomplished during traditional therapy. Individuals suffering from Post-Traumatic Stress Disorder (PTSD) or Serious Emotional Disturbances (SED) could greatly benefit from TI-EFP.

Limited research has studied the effects of EFP on SED or at-risk adolescents.

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Ewing et al. (2007) hypothesized that EFP would increase SED participants' empathy and internal locus of control while decreasing participants' depression and aggression. The results showed trends supporting the hypothesis but the trends were not statistically significant (Ewing et al., 2007). Other studies have found significant results using EFP as treatment for at-risk adolescents. For example, EFP studies have shown to decrease negative behaviors, anxiety, depression, and overall psychological distress while increasing participants' social skills, internal locus of control, confidence, and self-worth (Trotter, Chandler, Goodwin-Bond, & Casey, 2008; Lentini & Knox, 2009; Bowers & MacDonald, 2001). Clients have anecdotally displayed and reported feeling immediate changes in affect during equine therapy, but no study has systematically investigated immediate changes in affect during equine therapy.

Affect has been found to be a reliable measure of mood. The Positive and Negative Affect Scale (PANAS) is a twenty-item scale measuring both positive and negative affect. The PANAS has different time intervals such as the current moment, today, the past week, and the past month. Interestingly, there are mixed results with the correlation between positive and negative affect and the questionnaire's different time intervals. For example, Diener and Emmons (1984) found a negative correlation between affect and time intervals whereas Watson et al. (1988) did not find any correlation. Watson, Clark, and Tellegen (1988) found that high positive affect scores indicate a happy, energetic mood while high negative affect scores indicate an anxious, negative mood. The PANAS questionnaire was also found to be an accurate measurement of moment to moment mood fluctuations and has also been validated for mood assessment in psychiatric patients as well (Watson et al., 1988). For example, the PANAS score

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remained fairly consistent throughout the day which supports its reliability of measuring overall affect (Watson et al., 1988).

The PANAS has also been investigated in adolescent and adolescent psychiatric populations. There are strong and replicated findings of correlations between affect, anxiety, and depression (Hughes & Kendal, 2009; Joiner, Catanzaro, & Laurent, 1996). For example, negative affect is positively correlated with measurements of depression and anxiety (Hughes & Kendall, 2009; Joiner et al., 1996). Likewise, Hughes and Kendall (2009) found that as positive affect increases, depression decreases. These results support that the PANAS is reflective of mood. For example, these results lucidly bolster that negative affect reflects levels of depression and anxiety. Similarly these results also indicate that the PANAS remains reliable even in adolescent and clinical populations (Hughes & Kendal, 2009; Joiner et al., 1996).

Research has examined the immediate changes in affect in adolescents with conduct disorders (McBurnett et al., 2005). McBurnett et al. (2005) found significant increases in negative affect immediately after the participant had to describe a negative life event. In contrast, participants showed increases in positive affect immediately after a simple counting challenge while negative affect was unaffected (McBurnett et al., 2005). Additionally, McBurnett et al. (2005) found higher negative affect and lower positive affect in populations with conduct disorders. Overall, the PANAS appears to be a reliable measurement of mood in clinical adolescent populations. Although no research has attempted to examine the effects of therapeutic interventions, such as equine therapy, on levels of positive and negative affect.

The current study aims to examine the immediate effects that equine therapy and

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traditional group therapy have on adolescents with SEDs. Due to the benefits that horses add to the therapeutic environment, such as decreasing anxiety, we hypothesized that equine therapy would significantly improve overall affect more than traditional group therapy. More specifically, we predicted that equine therapy would engender greater decreases in negative affect compared to traditional therapy.

Methods

Participants

The study included 37 adolescents between the ages of 12 and 18. Twenty-five participants (73.529%) were male and 9 participants (24.32%) were female. The average age for all participants was 15.05 years old (male = 15.07; female = 15). All participants fit the diagnosis of a Serious Emotional Disturbance (SED) and were participating in the Youth Dynamics Inc. (YDI) therapeutic group home treatment. There were a wide range of diagnoses including ADHD, anxiety, depression, PTSD, and defiance disorders (see Table 1.1 in Appendix A for detailed diagnosis demographics). Sixteen male participants were in the Highly Sexualized Unit (HSU), 9 male participants were in the Behavioral Unit (BU), and 9 female participants were in the BU. Participants in the HSU had committed some form of illegal sexual offense. A majority of the HSU participants had highly sexualized behaviors and had experienced some form of sexual abuse themselves. Both the male and female BU participants had behavioral problems such as defiance disorders. A majority of the BU participants had been legally convicted due to issues such as aggression, physical assault, or illegal substance use.

All clients in the therapeutic group home were included in the study. Participants were only excluded from the study if they and their legal guardians did not consent to

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participate in the study or if the participant was deemed unsafe to participate in equine group therapy due to behavioral dangers. Only one participant was excluded from participating in the equine therapy session in the eighth week due to extremely unsafe behavioral outbursts. The suitability to exclude the participant from the equine session was judged by the therapist and group home manager. Likewise, participants who did not participate in the study for more than two weeks were excluded from the study's data analysis. Three participants were excluded from the data analysis due to this exclusion criteria (N = 34).

Measurements and Materials

Participants' improvements were measured using the Positive and Negative Affect Scale (PANAS). The PANAS is a twenty-item scale using a five-point Likert response that measured immediate positive affect and negative affect (Watson, Clark, & Tellegen, 1988). Participants who felt eager and lively would have higher positive affect scores whereas languid and unhappy participants would have lower positive affect scales. Distressed and anxious participants would have higher negative affect scales whereas calm and content participants would have lower negative affect scales.

Materials were specific for the EFP sessions which included up to 10 horses. Each horse was screened by a professional therapeutic riding instructor using screening tools through the Professional Association of Therapeutic Horsemanship (PATH). Equine ages ranged from 10 to 27 years old, the sizes ranged from roughly 13 hh to 17 hh, and included breeds such as Icelandic, Halflinger, thoroughbred, quarter horse, and Arabian. Horses were used according to the guidelines and regulations provided by PATH. Other

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materials included items for equine therapy such as carrot sticks, barrels, equestrian tack, helmets, and brushes.

Procedure

Participants received both traditional group therapy and group equine therapy once a week over a period of 8 weeks as part of the requirement for the therapeutic group home treatment. Participants filled out a PANAS questionnaires immediately before and after each traditional and equine session. Participants were divided into four separate units by the organization. Each unit included a maximum of eight clients in the unit at once. Each unit received both types of therapy individually. Equine therapy and traditional group therapy were received at least 48 hours apart from one another. For example, unit A would receive equine therapy on Monday and then receive traditional group therapy on Wednesday.

Traditional group therapy sessions were held in each unit's group home located at the YDI in Boulder, MT. EFP sessions were held at the YDI group home and equine center located in Helena, MT. Participants were transported from Boulder to Helena once a week for equine therapy by YDI group home staff. Participants filled out PANAS questionnaires immediately after their arrival at the equine center. Then the participants were divided into two groups. One group participated in EFP for 45-60 minutes while the other group participated in barn chores for 45-60 minutes, then the groups would switch so all participants did both EFP and barn chores. Participants filled out post PANAS questionnaires immediately after equine therapy. Both equine therapy and traditional group therapy followed models of TF-CBT. A licensed therapist led the traditional group therapy sessions at the group home. Equine therapy sessions were led by a licensed

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therapist and a licensed therapeutic riding instructor accompanied by equine specialists (see Appendix B for the outlined EFP program).

Results

Data was analyzed using a repeated measures mixed ANOVA to measure the main effects of therapy (2; equine, group), affect (2; positive, negative) and time (2; before, after). There was a significant main effect of therapy between equine and group where equine therapy had higher overall affect than traditional group therapy ($F(1,8) = 23.362, p = 0.001$). The main effect of affect was significant where positive affect was significantly higher than negative affect ($F(1,8) = 9.146, p = 0.016$). The main effects were mediated by a significant interaction between therapy and affect ($F(1,8) = 25.629, p = 0.001$). Follow-up tests indicated that scores were significantly more positive for positive affect compared to negative affect in equine therapy ($t(33) = 8.762, p < 0.001$) and group ($t(33) = 6.015, p < 0.001$). Important to the current research, positive affect was significantly more positive in equine therapy (see Figure 1.1 in Appendix A) compared to group therapy ($t(33) = 5.426, p < 0.001$). There was no significant difference in negative affect (see Figure 1.2 in Appendix A) between equine and group therapy ($t(33) = -1.167, p = 0.252$).

Additionally, time and affect had a significant interaction ($F(1,8) = 12.836, p = 0.007$). Follow-up tests showed that regardless of therapy type, individuals increased in positive affect after therapy (see Figure A 1.3 in Appendix A) compared to before therapy ($t(33) = -4.795, p < 0.001$). Results also revealed that regardless of therapy type individuals decreased in negative affect following therapy (see Figure A 1.3 in Appendix A) compared to before ($t(33) = 2.363, p = 0.024$). There were no significant interactions

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between therapy, time, and affect indicating that changes in affect before and after both therapy types were not significantly different ($F(1,8) = 0.215, p = 0.655$). Likewise, there were no significant interactions between week, therapy, time, and affect indicating that the length of treatment did not affect PANAS improvements before and after therapy regardless of therapy type ($F(6,48) = 0.946, p = 0.434$).

Finally, we were interested in evaluating whether the difference in scores in positive and negative affect differed between group and equine therapy. Follow-up t-tests compared the difference between before and after in both positive and negative affect in the two types of therapies. Even though individuals rated equine more positive both before and after treatment, there was no significant change in affect in equine compared to group for either positive ($t(34) = 1.119, p = 0.271$) or negative ($t(34) = 0.954, p = 0.347$). The improvements in both positive and negative affect were no different in equine compared to group, even though equine therapy started with significantly higher positive affect.

Discussion

The results support the hypothesis that equine therapy (EFP) would have higher overall affect than group therapy. The results suggest that positive affect before and after EFP is significantly higher than positive affect before and after group therapy. The study also found a significant increase in positive affect after both therapy groups. However, the results did not support the hypothesis that EFP would reduce negative affect significantly more than traditional therapy, but negative affect after both therapies was significantly lower. The results suggest that EFP is similarly effective to traditional group therapy in increasing positive and decreasing negative affect.

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To our knowledge, this is the first study to quantitatively measure the effects of EFP on positive and negative affect. Previous EFP research has reported anecdotal improvements in positive affect (Klontz, Bivens, Leinart, & Klontz, 2007). For example, past research has found that EFP significantly increases social competence, increases positive social behaviors, decreases negative social behaviors, and decreases depression in at-risk adolescent populations (Bowers & McDonald, 2001; Pendry & Roeter, 2013; Trotter et al., 2008). These improvements parallel behavioral improvements with higher levels of positive affect such as enhanced social engagement and increased motivation (Forbes & Dahl, 2005). These findings could be caused by an increase in positive affect due to interacting with horses. This study's results indicate that EFP has a unique effect on positive affect which can be explained by some therapeutic characteristics inimitable to EFP.

Positive affect has several imperative clinical and neurological implications for the SED population. Chin, Ebesutani, and Young (2013) highlight the significant interactions between affect, depression, and anxiety in SED adolescents. For example, positive affect has significant negative correlations with disorders such as depression and anxiety (Eisner, Johnson & Carver, 2009). Since positive affect is highly related to anxiety and depression, which are common comorbid disorders in SED populations, treatment focusing on positive affect might benefit SED clients. Behaviors such as social engagement, reward seeking, and motivation are highly associated with positive affect (Forbes & Dahl, 2005). Conversely, depressive symptoms are characterized by opposite behaviors such as decreased motivation, anhedonia, and social isolation (Forbes & Dahl, 2005). This suggests why depression is correlated with lower positive affect especially in

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SED adolescents. Similarly, anxiety disorders are plagued by behaviors such as social anxiety and decreased reward seeking behaviors which also correlate with decreased positive affect (Eisner et al., 2009). EFP offers opportunities for clients to participate in positive approach behaviors such as socializing with the horses. Participating in EFP opposes negative symptoms common to SED adolescents, such as social isolation, which could explain why EFP has significantly higher positive affect compared to traditional group therapy.

The relationships between EFP and positive affect may be elucidated by the neurological components of positive affect relating to rewards and expectations. For example, positive affect is associated with brain areas such as the striatum, orbitofrontal region, and amygdala which are involved in reward behaviors and expectations (Forbes & Dahl, 2005). This has neurological implications in depression because abnormal dopamine release to brain regions such as the orbitofrontal region and striatum can significantly lessen a person's motivation (Forbes & Dahl, 2005). Decreased motivation and reward seeking can be seen externally as depressive symptoms such as social isolation and decreased motivation. Chin et al. (2013) examined the relationship between affect, depression and anxiety in SED adolescents. They found significant negative correlations between positive affect and depression as well as positive correlations between anxiety and negative affect (Chin et al., 2013). Depression and anxiety have high comorbidity rates within SED populations. Perhaps by increasing positive affect and positive affect related behaviors, depressive and anxiety related symptoms would diminish and improve SED clients. Therefore, improving positive affect has crucial neurological and clinical implications especially in SED adolescents.

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Likewise, EFP could improve positive affect through neurological activation. One study examined children's brain activity while grooming horses and during control conditions (Crews, Mundt, & Ringenbach, 2014). EEG measurements revealed significantly increased activation of the left frontal lobe while grooming the horses compared to control conditions (Crew et al., 2014). Positive affect has also been correlated to increased left frontal lobe activation (Davidson, 1998). Approaching and socializing with the horses have increased left frontal lobe activation which in turn increased positive affect or left frontal lobe activation could have motivated approach behaviors which then increased positive affect. The mere anticipation of working with the horses in group therapy could have been rewarding to participants and activated approach systems which correlates with left frontal lobe activation and positive affect. Future research needs to examine the causal relationship between EFP, left frontal lobe activity, and positive affect.

The increases in positive affect could be engendered by the nonjudgmental social interactions and physiological benefits that horses offer. EGALA (2009) highlights that horses offer social interactions void of judgment or rejection. Having a nonjudgmental social environment during EFP could improve positive affect by encouraging social approach behaviors. Since positive affect effects social interactions and reward behaviors, an increase in positive affect could increase socialization by enhancing overall motivation or vice versa. Similarly, Lucht et al. (2009) found that individuals with dysfunctional oxytocin receptors had significantly lower positive affect and social behaviors. They concluded that decreased oxytocin reuptake negatively impacts prosocial behavior and positive affect (Lucht et al., 2009). Chandler (2012) highlights the role of oxytocin while

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socializing with animals. Physically touching and interacting with animals has shown to increase oxytocin levels (Chandler, 2012). Oxytocin plays an important role in social bonding. Likewise, oxytocin has been positively correlated with increased social behaviors (Chandler, 2012). Brain regions such as the amygdala are affected by oxytocin which relates to positive affect behaviors such as expectations and reward (Chandler, 2012; Forbes & Dahl, 2005). In this case, being with the horses could cause a release of oxytocin which could be rewarding to clients and increase their positive affect and social approach behaviors. Increased oxytocin could physiologically explain why EFP increases positive affect and social approach behaviors. Levy et al. (2015) suggested that at-risk youth with conduct problems and lower levels of oxytocin were more likely to have callous unemotional traits compared to youth with higher levels of oxytocin. Therefore, EFP could increase oxytocin levels and reduce antisocial behaviors in SED adolescents by increasing positive affect.

The finding that EFP produced similar improvements as group therapy in increasing positive and decreasing negative affect is not surprising. CBT has shown to be successful in treating SED populations (Roberts et al., 2003). More specifically, Jensen et al. (2013) found that trauma-focused CBT improved depressive and other psychological symptoms more than typical treatment with adolescents. It is to be suspected that there would be similar PANAS improvements since both therapies were structured after a trauma-focused CBT model. EFP would be just as effective because the treatments are structured in a similar way, except EFP includes the addition of horses. Therefore, this study's findings can be explained due to the previous success that CBT has had in treating SED clients (Roberts et al., 2003). The previous success that CBT has had on

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SED clients also suggests that there are limited negative psychological risks in adding horses into the therapeutic process. If the EFP sessions are structured like traditional forms of therapeutic treatment, the benefits could be similar to those of traditional treatments.

However, the finding that EFP did not significantly affect negative affect was unexpected. Anecdotally, clients have been observed to have less external anxiety and appear calmer during EFP which is why it was hypothesized that EFP would significantly decrease negative affect. This result could be explained by the fact that EFP offers more improvements in positive approach than it does in negative affect. It was assumed that clients would experience lower negative affect as a result of increased positive affect. But other findings suggest that positive and negative affect are fairly independent of one another (Watson et al., 1998). For example, it would be assumed that depression is related to higher levels of negative affect but research suggests the exact opposite. Hughes and Kendall (2009) found a negative correlation between positive affect and depression where individuals with higher depression had less positive affect. Previous research suggesting that EFP decreases depression could then be explained by an increase in positive affect rather than by a decrease in negative affect. Another study found that when adolescents with conduct disorders were given a challenge to navigate, such as a word puzzle, they experienced a significant increase in positive affect, but the challenging activity had no effect on negative affect (McBurnet et al., 2005). McBurnet et al. (2005) suspected that having to actively engage in problem solving might have increased positive approach behaviors and improved positive affect. It could be explained that the benefits of EFP are more related to approach and prosocial behaviors which

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increase positive affect rather than reducing negative affect. This explanation also elucidates why the current study found that EFP has significantly overall higher affect than traditional therapy because EFP significantly affected positive affect more than negative affect.

This study attempted to control as many confounding variables as possible but there are also other potential explanations for the results. For example, all participants were in the same environment, had similar demographics, received similar diagnoses, and received the same amount of additional treatment provided by the same mental health professionals. Similarly, both therapies were structured after trauma-focused CBT to make the addition of horses the only difference between the therapy types. But there remain other possible explanations behind these improvements in PA besides EFP. EFP remains a difficult treatment to systematically research due to confounding variables. For example, simply being outside and physical movement could both increase clients' positive affect. Likewise, being in a new environment could excite clients. The participants remained in residential treatment during the study and had limited opportunities to leave the facility other than for EFP. Merely leaving the facility could enhance their overall affect. With many confounding variables, it is difficult to contribute their improvements directly to EFP. Future research should attempt to control for confounding variables such as being outside and physical movement. For example, studies could be conducted comparing differences between EFP conducted outside versus inside. Likewise future research could examine the effectiveness of EFP with limited to no physical movement. Regardless of controlling as many confounding variables as possible, this study still has some limitations.

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Limitations such as participants' length of treatment, a single measurement tool, and an overall difficult participant population might have factored into the study's results. Firstly, not all participants experienced the same length of treatment. Some participants remained throughout the entire study whereas others left treatment before the study terminated or entered the study late. But there was a minimum requirement of participating for more than two weeks in order to include participants in the data analysis. About 70% of participants participated for six or more weeks of the study. Additionally, week was not a significant factor in PANAS ratings. The aim of this study was to measure immediate changes in affect before and after therapy instead of measuring improvements over extended periods of time. Future research would benefit from understanding the change in SED symptoms before and after treatment. Secondly, the use of a single measurement tool also might limit the study's results. The PANAS provided a quick and simple measurement of self-reported affect. Unfortunately, self-reports are not always the most accurate representation. However, participants seemed actively engaged while taking PANAS questionnaires and responses seemed appropriate. Future research should include an external measurement of affect such as the frequency of negative behavior observations in addition to self-reported PANAS scores. Thirdly, the unique population could also potentially limit the study. For such a choleric and intransigent population, the amount of questionnaires could be too repetitive. But the current study reduced the repetition as much as possible and employed a simple, quick questionnaire to make it as easy as possible for participants. Future research should reduce the frequency of questionnaires or decrease the length of the study. Likewise, the PANAS could have also been rearranged in different orders to prevent participants from memorizing the

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questionnaires order. All of these limitations remain fairly minor factors in the study's results.

This study acts as the first known quantitative investigation of the effects of EFP on positive and negative affect in SED adolescents. This study was able to quantitatively support anecdotal reports of improved affect following EFP sessions by showing that overall, SED adolescents had more positive affect before and after EFP than traditional group therapy. Likewise, the significant improvement in positive affect unique to EFP could also elucidate previous findings such as improved social behavior and reduced depression. Most importantly, this study provides evidence suggesting EFP as a potentially beneficial treatment for adolescents with SED.

EFP could be an effective complementary treatment for SED individuals to improve their attitudes toward therapy. SED clients are disreputably difficult to treat due to their negative or ambivalent attitudes toward therapy. EFP offers clients a motivational therapeutic outlet that possibly enhances social approach behaviors which in turn could make therapy more interactive and enjoyable. Likewise, EFP is more beneficial in improving baseline and post levels of positive affect. This study shows that EFP effects positive affect before clients even begin the therapy session. Simply the knowledge of participating in equine therapy is enough to improve positive affect. Horses obviously have a powerful impact on this population without even having to handle a horse. This study suggests that EFP could be uniquely beneficial to notoriously difficult or impervious populations such as SED adolescents.

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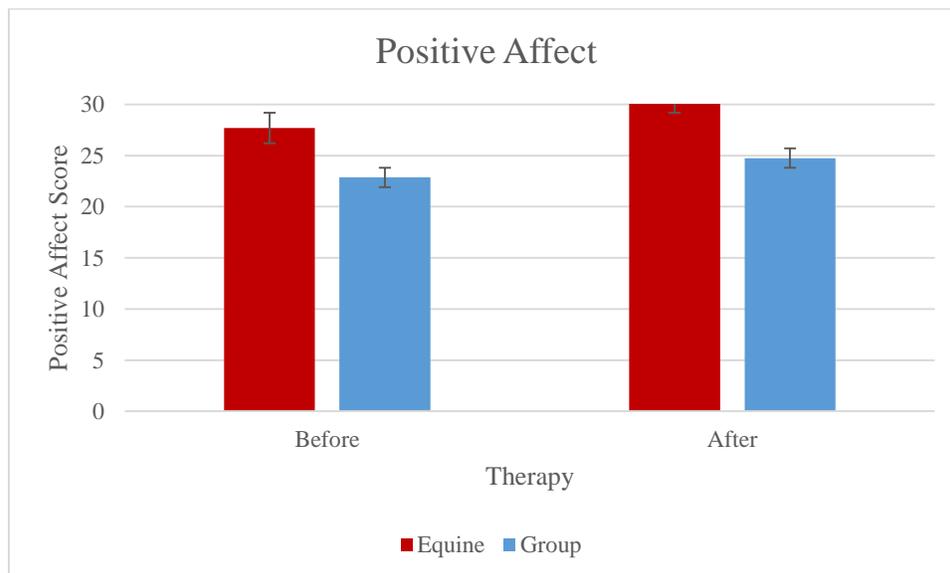
Appendix A

Table A 1.1

Demographics	Frequency (%)	Total Number (n)
Male	73.53%	25
Female	26.47%	9
Age 12-13	14.71%	5
Age 14-15	38.24%	13
Age 16-17	47.16%	16
Neurodevelopmental Disorder	41.18%	14
Bipolar and Related Disorders	8.82%	3
Depressive Disorders	41.18%	14
Anxiety Disorders	23.53%	8
Trauma and Stressor Related Disorders	82.35%	28
Disruptive, Impulse Control, and Conduct Disorders	61.77%	21
Substance Related and Addictive Disorders	29.41%	10
Paraphilic Disorders	11.76%	4

Figure A 1.1

Significant interaction between therapy x affect ($P = 0.001$) where positive affect was significantly higher before and after equine therapy than group therapy.



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Figure A 1.2

Significant interaction between therapy x affect ($P = 0.001$) but there were no significant differences between therapy and negative affect ($P = 0.252$).

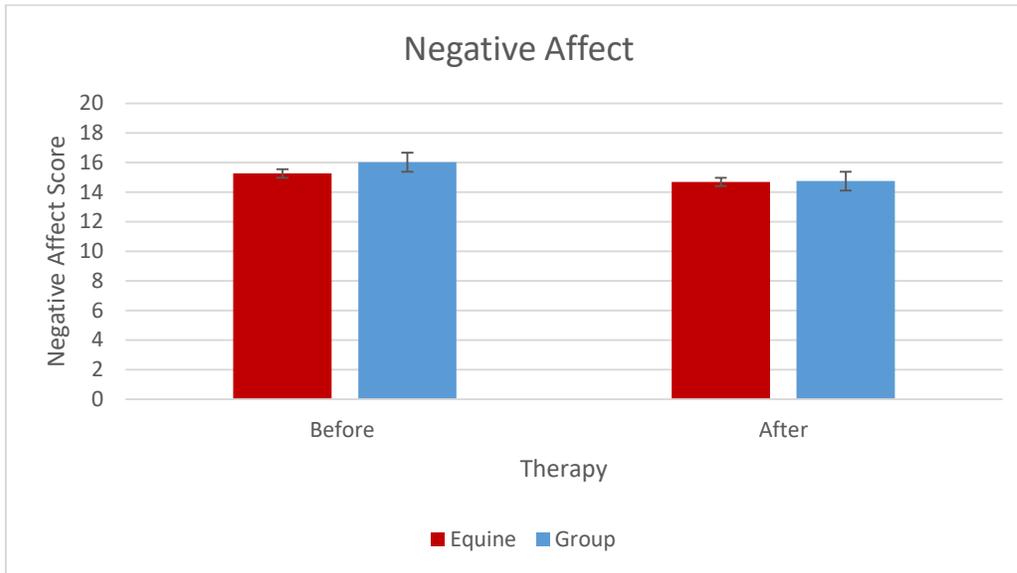
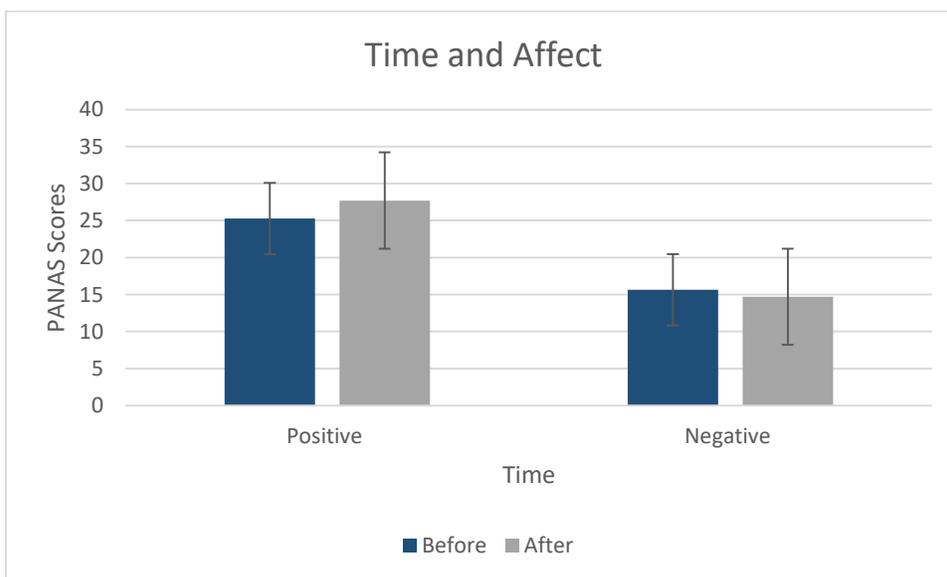


Figure A 1.3

Significant interaction between time x affect ($P = 0.007$) where regardless of therapy type there were significant increases in positive affect ($P < 0.001$) and significant decrease in negative affect ($P = 0.024$).



Appendix B

Trauma-Informed Equine-Facilitated Psychotherapy (TI-EFP) Sessions

****A 2 minute mindfulness body scan will be done every time before clients start handling horses and before they put the horses away****

****PANAS questionnaires will be given to clients immediately before and after equine group (not before or after barn chores)****

Session 1: Psychoeducation and Horse Safety

Goal: learn how to safely work around the horses

1. Horse Safety: Speaking the Language in Horse Country
 - a. Safety Circle: each participant says their safety statement to the group. For example, “I promise to keep myself and others safe by asking for help when I need it” or “I promise to keep myself and others safe by lowering my energy levels around the horses”
 - b. Ask clients how they express their feelings, “How do you let others know that you’re upset?”
 - c. Discuss how horses are prey animals and how they use their body language to let others know how they’re feeling. Focus on body parts such as the horse’s
 - i. Ears: different ear positions mean different things. Have participants make their hands into pretend horse ears and have them practice the different ear positions
 1. Ears forward: means that the horse is interested in something. You should look where the horse’s ears are pointing to try and figure out what they’re interested in to anticipate what they’ll do next. Example: if the horse’s ears are pointing toward food, he probably wants to eat. If the horse’s ears are pointed toward a big tractor moving across the field, the horse might become scared.
 2. Ears floppy out to the side: means that the horse is relaxed and you should keep doing whatever you’re doing.
 3. Ears pointing backward: means that the horse is listening to something behind him. You should look where his ears are pointing to try and figure out what he’s hearing.
 4. Ears pinned flat against his head: means that the horse is angry. You should stop what you’re doing, slowly step away, and evaluate what made him angry, were you brushing him too hard, are the flies bothering him?
 - ii. Eyes: discuss horses’ blind spots. Horses can see all the way around them and areas above them, but horses can’t see directly in front of them or directly above them. Asks clients what their “blinds spots” or triggers are and how others can help them feel

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safe. Then brainstorm how we can help the horses feel safe when we're in their blind spots.

1. Approaching the horse: never approach a horse head on because they cannot see you as well. Instead, approach the horse from the side and softly talk to them so they know that you're there.
2. Walking behind the horse: there are two ways to walk behind horses; the long way or the direct way.
 - a. The long way: when you have a lot of space you can walk behind the horse by giving them a lot of space. You can walk behind them keeping about two horse legs lengths away from their rear end.
 - b. The direct way: we don't always have enough room to walk the long way around the horse such as when we're in the barn. In those cases you walk directly behind the horse. Gently place your hand on the horse's side and slowly walk directly behind the horse while keeping your hand on them and softly talk to them to let them know where you are.
- iii. Legs: describe different horse leg movements and what they mean
 1. Pawing legs: sometimes horses paw their front legs. Typically horses do this when they're bored or want attention
 2. Relaxed hind legs: horses will rest one of their hind legs when they get tired, this means that they're relaxed
 3. Jerky hind legs: when a horse jerks one of his hind legs up, this is a warning that he might kick. If he does this you should stop what you're doing and slowly take a few steps back.
- iv. Tail: discuss how horses use their tails to flick flies off but also how they use their tails when they're annoyed.
 1. Gentle tail flicking: this means that the horse is relaxed and just trying to keep the flies away
 2. Quick tail whipping: when the horse whips his tail, this means that he's annoyed and you should stop doing what you're doing to figure out what's annoying him
2. If time allows, have clients groom horses
3. Processing questions;
 - a. How do horses communicate differently than humans?
 - b. How do you communicate with others? Is it effective?
 - c. How can you improve your communication skills with the horses?
 - d. How can you improve your communication skills with people?

Session 2: Psychoeducation Trauma Treasure Hunt

Goal: normalize response to trauma and reinforce accurate cognitions about trauma

1. Safety circle and safety statements

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2. Pair up clients, have one “hunter client” and one “horse handler client”
3. Have the hunter client look for hidden cards on the horse playground, once they find a card, have the horse handler client lead the horse to where the card was found.
4. Have clients read the trauma fact card out loud to the horse.
5. Once the card has been read, the clients can feed the horse treats that were hidden with the trauma fact card to the horse.
6. Repeat this exercise and have clients switch roles until all of the cards have been found.
7. Processing questions;
 - a. What did you learn about trauma today?
 - b. Did any of the facts surprise you? Why or why not?
 - c. How can you use this new knowledge moving forward in your treatment?

Session 3: Psychoeducation Physiological Symptoms of Stress

Goal: normalize responses to trauma and reinforce accurate cognitions about trauma

1. Safety circle and safety statements
2. What do we feel when we are stressed or triggered?
 - a. Heart rate increases
 - b. Respiration increases
 - c. Adrenaline
3. Discuss horses as prey animals
 - a. Flight or fight response → heart rate and respiration increases
4. Discuss the differences between horse and human responses to stress
 - a. Horses run away → “run off stress”
 - b. Humans mostly internalize → stress accumulates
 - i. When stress hormones accumulate it can actually be toxic to the body
5. Have clients take their own and their horse’s resting heart rate and respiration
6. Have clients lead horses while trotting and then have them take their own and their horse’s heart rate and respiration after running/trotting
7. Processing questions:
 - a. How do you feel when you’re anxious or triggered?
 - b. What did you notice about the horse’s heart rate at rest and then after trotting?
 - c. What are some things that could help bring a horse’s heart rate down?
 - d. What are coping tools that can help bring your heart rate down?

Session 4: Stress Management Belly Breathing

Goal: learn relaxation techniques to help reduce physical signs of stress related to PTSD

1. Safety circle and safety statements
2. Teach participants how to take belly breaths (belly should expand when they inhale)
3. Have client observe horse’s stomach while the horse breaths. Have participants breath at the same rate of their horse (horses’ resting respiration rate is 12-24 breaths per minute so this will encourage the client to take slower breaths)

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4. Leading and breathing: have client lead the horse and practicing belly breathing in rhythm with the horse's steps. For example, inhale for 2 steps and exhale for 3 steps, inhale for 3 steps and exhale for 5 steps, inhale for 4 steps and exhale for 7 steps, etc.
5. Processing questions:
 - a. Did you find it hard to slow down your breathing?
 - b. How did your breathing affect your emotions?

Session 5: Stress Management Muscle Relaxation

Goal: teach participants to contract and then systematically relax their muscles

1. Safety circle and safety statements
2. Have the client hold the horse's lead rope and tense up their leg muscles. Then client will slowly stroke the horse's neck.
3. With each long stroke, have client inhale and release muscle tension with each exhale. Keep stroking and breathing until the entire muscle is relaxed again.
4. Continue this exercise until the client can tense and relax their whole body.
5. Can be done while mounted or on the ground
6. Processing Questions;
 - a. Did you find it easy or difficult to relax?
 - b. Where did you notice the most tension?
 - c. Were there certain parts of your body that were harder to relax than others?
 - d. How can you use this relaxation technique as a coping tool?

Session 6: Affect Expression and Modulation Feelings Obstacle Course

Goal: to learn to express and manage feelings effectively

1. Safety circle and safety statements
2. Set out an obstacle course such as weaving through cones, walking over logs, going over bridges, etc..
3. Have client identify emotions that they struggle with such as anger or guilt.
4. Label each obstacle with an emotion and have the client lead the horse through the obstacle course.
5. At each obstacle have the client say why they struggle with that emotion and coping tools they can use when they feel that emotion, then allow the client to navigate the obstacle. **this exercise can be done on the ground or while mounted**
6. Processing Questions;
 - a. What emotion do you struggle with the most?
 - b. Was it hard to overcome this obstacle today?
 - c. What tools did you use to help you navigate the obstacle?
 - d. How can you apply these tools to achieve your treatment goal?

Session 7: Affect Expression and Modulation Feelings Card Relay Race

Goal: get clients to identify feelings, thought road blocks, and effective coping skills

1. Safety circle and safety statements
2. Divide group into two teams

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3. Have client draw a feelings card, the have them walk to the other side with the horse
4. Once the client gets through the obstacle course they have to think of an example of a time when they felt that feeling and share it with the staff
5. Have client walk back through the obstacle course thinking of coping skills
6. Client must tell the staff the coping skill they could use when they feel that emotion before the next client can begin.
7. Continue until every client has gone
8. Processing questions:
 - a. What feeling did you draw? Can you relate to that feeling?
 - b. What was easier, walking the horse there with the feeling or walking the horse back with the coping tools?
 - c. What coping tools helped you the most?
 - d. How can you relate this exercise to when you feel yourself escalating?

Session 8: Affect Expression and Modulation Raising Your Feelings Temperature

Goal: learn to express and manage feelings effectively

1. Safety circle and safety statement
2. One rail in the arena is “sad” and the opposite rail is “happy”
3. Have client take horse to where they feel in the moment (on the feelings spectrum)
4. Then have clients brain storm things that make them happy
5. For every happy thought have them take a step closer to the “happy” rail
6. Continue until every client has reached the “happy” rail
7. Processing questions:
 - a. Where do you think you fall on the feelings spectrum in general?
 - b. Was it hard or easy to think of happy thoughts?
 - c. How did you feel once you got closer to the happy rail?
 - d. How can you apply this to your treatment?

Session 9: Cognitive Coping TBF Matching Game

Goal: understand the cognitive triangle, how thoughts, feelings, and behaviors relate

1. Safety circle and safety statement
2. Explain the difference between thoughts, feelings, and behaviors
 - a. Thought: Monte wants to leave
 - b. Feeling: Monte is afraid
 - c. Behavior: Monte ran away
3. Give each client a card with either a thought, feeling, or behavior
4. Have client take horse to the correct bucket to put their card in
5. Have client give a real life example of a thought, feeling and behavior
6. Client goes to each bucket and tells staff about a thought, feeling, or behavior
7. Brainstorm coping tools to help with the thought, feeling, and behavior
8. Processing questions:
 - a. Did you know the differences between thoughts, feeling, and behaviors?
 - b. What was easiest to think of, a thought, feeling, or behavior?

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- c. What are some tools you can use to keep negative thoughts and feelings from turning into negative behaviors?
- d. What are examples of healthy thoughts, feelings, and behaviors?
- e. How can you use what you learned today during your treatment?

Session 10: Cognitive Processing Thinking Error Obstacle Course

Goal: explore and correct inaccurate thoughts related to the trauma and its meaning in clients' lives.

1. Safety circle and safety statements
2. Discuss what inaccurate and negative thoughts are and how we can counteract them
3. Have clients create an obstacle course and label each obstacle with a thinking error.
4. As the client leads the horse through the obstacle course, at each obstacle the client must state the thinking error and say if it's helpful or not.
5. Before the client can move on from the obstacle, they must come up with a positive/helpful thought.
6. Once the client has said a helpful thought, then they can navigate the horse through the obstacle.
7. Continue this process through every obstacle
8. Processing questions:
 - a. What were some common thinking errors that you had?
 - b. How do these thinking errors affect you in your everyday life?
 - c. How did it feel to battle the thinking errors with helpful thoughts? Was this easy or hard to do?
 - d. How can you use this experience to help you in your treatment goals?

Session 11: Cognitive Processing Friendly Ball Game

Goal: explore and correct inaccurate thoughts related to the trauma and its meaning in the clients' lives.

1. Safety circle and safety statements.
2. Briefly discuss what inaccurate thoughts are and how to counteract them.
3. Have one client stand across from a staff member (who's holding a horse)
4. Have the client write a negative thought on the ball
5. Each time they throw the ball, have them erase the negative thought and replace it with a positive thought.
6. Take a step closer to the horse with every positive thought until the client is right next to the horse.
7. Processing questions:
 - a. Was it easier or harder to think of positive thoughts or negative thoughts?
 - b. Did the exercise get easier with the more positive thoughts you had?
 - c. How can negative thoughts get in the way of working with the horses?
 - d. How can negative thoughts get in the way of your treatment?

Session 12: Enhancing Future Safety

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Goal: have clients understand what assertiveness is and be able to ride and steer the horses on their own.

1. Safety circle and safety statements
2. Have clients tack up and mount their own horses
3. Have clients ride independently through a simple obstacle course
4. Processing questions:
 - a. How did it feel to ride the horse independently?
 - b. What did you struggle with the most?
 - c. How did you find the balance of being assertive?
 - d. Why is being assertive important?
 - e. How can you use this experience to help your treatment?