

## “Before, he fought every day with the horse and with me”: Reducing Violence in a Guatemalan Community through a Horse-Handling Program

Judith L. Gibbons<sup>1</sup>, Catherine A. Cunningham<sup>2</sup>, Leslie Paiz<sup>2</sup>,  
Katelyn E. Poelker<sup>1</sup>, & Marco Antonio Montufar Cardenas<sup>3</sup>

<sup>1</sup>Saint Louis University, <sup>2</sup>La Ronda Equestrian Club, &  
<sup>3</sup>Fundación Equinos Sanos Para El Pueblo

Community and family violence are endemic in Guatemala. We evaluated the effectiveness of a horse-handling program to reduce violent attitudes and aggressive behavior. Eighteen community members who worked with horses in their daily lives (16 men, 2 women, ages 15 to 58) participated in four weekly sessions of embodied experiences with horses. The program taught Monty Roberts' Join-Up<sup>®</sup>, a method of non-violent handling, as well as desensitization of horses to feared objects. Compared to the pretest, on a posttest participants were less likely to endorse violent attitudes with respect to wife-beating, corporal punishment of children, and physical punishment of horses. Their horses also were less reactive to the owner's approach. Female relatives reported that following the program participants provided better care for horses and were calmer and less aggressive with other people. These findings imply that an equine-facilitated program shows promise for transforming communities in which violence is prevalent.

*Keywords:* Equine-human interactions, attitudes towards violence, embodied experience, Guatemala

Correspondence concerning this article should be addressed to Judith Gibbons, Department of Psychology, Saint Louis University, Morrissey Hall, 3700 Lindell Blvd., St. Louis, MO 63108.  
E-mail: gibbonsjl@slu.edu

The most perilous risk for children and adolescents in Guatemala is immersion in a climate of violence, as a victim, perpetrator, or community member (United Nations Children's Fund, UNICEF, 2012). Guatemala ranks second among countries of the world in rates of violent deaths of children and adolescents, ages newborn to 20 (UNICEF, 2014). Children are also vulnerable to physical abuse, an offense that is greatly underreported, either for fear of retribution or a belief that severe physical punishment is appropriate for disciplining children (UNICEF, 2009). According to one survey, 25% of Guatemalan adults reported knowing a child being physically abused, and of those known cases, less than one third had been reported to authorities (UNICEF, 2009). Gang violence also plagues the country with

an estimated 8,000 to 14,000 members (Guatemala Human Rights Commission, GHRC, 2012; United States Department of State, 2014). For youth who struggle to find employment, gang membership is a tempting option, with initiations beginning as early as age 14 (GHRC, 2012). In a recent ethnographic study, Guatemalan adolescents claimed, "Violence is who we are" (Bellino, 2014, p. 149).

Violence can be endemic; domestic violence, intimate partner violence, and child physical abuse are interrelated and intergenerational (Renner & Slack, 2006). Attempts by the Guatemalan government and by US AID to reduce violence in Guatemala have been to a large extent unsuccessful (Office of Inspector General, U.S. Agency for International Development, 2014; United

States Department of State, 2013). Research in general (originating mostly from North America and Europe) on interventions aimed at reducing intra-familial and intimate partner violence has failed to identify an empirically-supported effective intervention (Gondolf, 2011) and some have called for more science to support the commonly administered programs (e.g. Dutton & Corvo, 2006). Moreover, cultural sensitivity is essential for any intervention (Carroll, Perez, & Taylor, 2014), and there is a scarcity of evidence about violence prevention and attenuation in low- and middle-income countries, including Guatemala. A PsycINFO search revealed no articles that included the key words violence prevention, violence reduction, or violence intervention and Guatemala; however, movement and sport therapy have been reported to be useful in improving self-esteem and a coherent worldview in Guatemalan women who had been victims of violence (Ley & Rato Barrio, 2011, 2012). It is clear that more efforts are needed to develop programs addressing the problem of violence in Guatemala, and to evaluate their effectiveness.

A promising approach for reducing violence is human-animal interaction (HAI), especially interaction with horses. Equine-assisted interventions have been applied to treat a wide range of psychological and physical problems as well as to promote human development and well-being (e.g. Masters, 2010; Selby & Smith-Osborne, 2013). Horses have been “engaged as change agents” (Selby & Smith-Osborne, 2013, p. 419) with varying success, to promote behavioral changes in combat veterans (Lanning & Krennek, 2013), children who have experienced family violence (Schultz, Remick-Barlow, & Robbins, 2007), and at-risk youth (Burgon, 2011). Horses may be particularly well-suited for these applications because people can become attached to horses (DeAraugo, et al., 2014), and horses

are sensitive detectors of nonverbal behavior (Hallberg, 2008; Vidrine, Owen-Smith, & Faulkner, 2002). What “horses bring to the therapeutic environment [is] cooperation, patience, willingness, receptiveness, and, after millennia of domestication, an orientation toward people” (Selby & Smith-Osborne, 2013, p. 418).

Research evaluating the effectiveness of equine-partnered experiences on anger, aggression, emotional regulation, or violence, is scarce, primarily descriptive, and/or poorly controlled (Anestis, Anestis, Zawilinski, Hopkins, & Lilienfeld, 2014; Selby & Smith-Osborne, 2013). In addition, the intervention itself, the interaction with horses, has varied from grooming and ground work to riding and vaulting. Finally, in many studies the equine part of the program was considered adjunctive or complementary to other counseling or psychological interventions, while in other studies equine-based programs have been implemented as stand-alone. The names and acronyms of programs facilitated by horses have also varied substantially, and have included equine-facilitated learning (EFL), equine-guided education (EGE), equine-assisted activities (EAA), equine-facilitated psychotherapy (EFP), equine-assisted experiential therapy (EAET), equine-facilitated body and emotion-oriented psychotherapy (EBEP), equine-assisted therapies (EAT), equine-assisted activities and therapies (EAAT), relational equine-partnered counseling (REPC), equine-assisted counseling (EAC), equine-facilitated mental health and education services (EFMH/ES), and hippotherapy. The use of diverse nomenclature and acronyms has further clouded the understanding of the efficacy of employing horses as change agents. Except when referring to others’ interventions, we will use the general term, equine-facilitated learning (EFL).

The rationale for and detailed description of an equine-assisted program were provided by Johansen, Arfwedson Wang, Binder, and Malt (2014). The manual-based program emphasizes emotion recognition and nonverbal communication and the proposed mechanisms of change rest in attachment, nonverbal communication, and positive emotions. The authors reported that patients who had not responded to other forms of psychotherapy showed improved awareness of their own emotions and anger reduction, although no systematic data were presented (Johansen, et al., 2014).

In a study of 63 children (ages 4 through 16) who had experienced intra-familial violence, a significant increase in well-being as measured by the Children's Global Assessment of Functioning (GAF) Scale was revealed following 19 equine-assisted psychotherapy sessions that included approaching, grooming, lifting hooves, and engaging in other ground work with horses (Schultz, et al., 2007). Children with a history of physical abuse and neglect showed the greatest improvement.

In another study, the behaviors of chronic psychiatric patients who had shown violent behavior in the hospital were evaluated before and after various interventions (Nurenberg, et al., 2015). Patients were randomly assigned to one of four treatment groups: equine-assisted psychotherapy, canine-assisted psychotherapy, life skills training, or regular hospital care. The group that received equine-assisted therapy showed significant decreases in aggressive behavior post-treatment. However, the random assignment to groups had resulted in an equine-assisted group with higher aggression scores on the pretest. Therefore the findings could have reflected only a statistical artifact, regression toward the mean.

Externalizing behaviors, such as non-compliance, hyperactivity, and aggression

were significantly reduced in children and adolescents (ages 8 to 17) following a series of interactions with horses as reported by their parents (Kemp, Signal, Botros, Taylor, & Prenticea, 2014). The activities with horses included "backing up a horse, asking a horse to yield his hind or front quarters, desensitizing a horse, asking a horse to circle around a person, jump over obstacles either on a loose rope or at liberty" (Kemp, et al., 2014, p. 561). The pre-post design incorporated three evaluation times: Time 1 – before starting intervention, Time 2 following 6 to 7 weeks of psychotherapy but before equine intervention, and Time 3 after equine intervention. Changes were reported between Time 2 and Time 3. There were also decreases in depression and anxiety, and (only in adolescents) trauma symptoms.

Therapeutic horsemanship, involving both grooming and riding, was associated with reductions in antisocial behavior and aggression of child and adolescent boys over 22 months of participation (Pearson, 1997). A retrospective review of charts for the seriously emotionally disturbed youth revealed that reported aggressive incidents decreased in all groups, independent of the frequency of riding. Overall, boys who rode more often and were more engaged in the riding program received fewer reports of aggressive incidents.

In a study by Trotter, Chandler, Goodwin-Bond, and Casey (2008), at-risk adolescents experienced a 12-week equine assisted counseling program (126 participants) or a classroom-based life skills program (control group of 38 participants). There were pre- and posttest measures of both self-reports and parents' reports. Parents of students in the equine-assisted program reported significant reductions in their children's aggressive behavior; that was not the case for the control group.

Other literature provides some indications of decreased anger and violence

following experiences with horses. In a review of studies of equine-facilitated interventions with children and adolescents, Lentini and Knox (2009) pointed to several case studies of reduced aggression following equine interventions, but also one report of increased aggression. In a pilot study, following a 5-day riding camp, children and adolescents (ages 7 to 17) reported less anger (Kaiser, Spence, Lavergne, & Vanden Bosch, 2004). Similarly, Kaye Gehrke (2009) has provided an anecdotal account of teaching leadership through experiences with horses. She emphasized that people learn that anger and aggression are not effective with horses, and they are then able to apply that knowledge to their own leadership activities.

Several well-controlled studies have demonstrated benefits of equine-facilitated learning, but the measures were not specific to anger, aggression, or emotion regulation. Instead, they showed improved social competence and decreased psychological distress (Klontz, Bivens, Leinart, & Klontz, 2007; Pendry, Carr, Smith, & Roeter, 2014; Pendry & Roeter, 2013). Moreover, cortisol levels, an indicator of stress and arousal, were reduced in children receiving an equine-facilitated intervention (Pendry, Smith, & Roeter, 2014). Although not measured directly aggression, anger, and emotion regulation were likely to have been affected in those studies. On the other hand, controlled studies designed to improve adolescents' self-image, self-control, trust, self-esteem, empathy, locus of control, depression, and loneliness have failed to reveal significant changes after EFL (Bachi, Terkel, & Teichman, 2012; Ewing, MacDonald, Taylor, & Bowers, 2007).

Despite the widespread use of equine-assisted therapies or interventions, there is a gap between evidence and practice (Bachi, 2012). The multiple equine-based programs that are used to alleviate psychological distress, change behavior, or foster human

development have limited empirical support (Anestis, et al., 2014; Selby & Smith-Osborne, 2013). For equine-assisted therapies or interventions to be effective and sustainable, more sound research is needed on the specific practices, target groups, and contexts that are effective (Selby & Smith-Osborne, 2013).

### *Monty Roberts and Join-Up®*

Handling and training according to Monty Roberts' Join-Up® are achieved through nonviolent communication to build a relationship of trust between the horse and the handler ("About Join-Up®", 2015; Roberts, 2002a, 2002b). Through the Join-Up® exercise, the horse sees the handler as the leader of the herd and comes to respect the handler without use of physical punishment ("About Join-Up®", 2015; Roberts, 2002a, 2002b). Roberts' Join-Up® has been shown to benefit horses as a less stressful and more effective training approach (Fowler, Kennedy, & Marlin, 2012). A systematic study (Fowler, et al., 2012) matched horses on temperament and randomly assigned them to two groups. One group was trained according to traditional methods in the United Kingdom and the other trained by the Monty Roberts horsemanship technique, a nonviolent method. Upon being saddled and accepting a rider for the first time, the maximum and average heart rates were higher for horses trained by traditional methods, as compared to those trained by the Monty Roberts technique. Finally, horses trained by the Monty Roberts technique showed better performance on a series of walking, trotting, and cantering exercises. These results suggest that not only is the Monty Roberts technique more effective in training horses, but also that horses handled through these techniques show less anxiety and fear as indicated by a diminished heart rate response to initial saddling and riding.

The Join-Up<sup>®</sup> approach differs greatly from the conventional horse training methods employed in Guatemala. The traditional way of handling equines in Guatemala involves coercion, violence, and punishment. Typically horses are first thrown to the ground, and then loaded with a heavy burden that they are forced to endure for long periods of time. Additionally, handlers often beat them to make them walk faster. These violent practices can cause suffering and psychological damage to working equines, who cannot be rehabilitated (M. R. Sapón Pellecer, Director General, Fundación Equinos Sanos para el Pueblo-ESAP, personal communication, May 7, 2015). Both the punitive horse-handling and the high rates of violence against women may be linked to the ideology of machismo, a hypermasculinity that prescribes aggression and domination (McClaurin, 1996; Menjívar, 2011; Velzboer-Salcedo & Novick, 2000).

### *Embodied Cognition and Learning*

Recent research in learning and cognition has begun to emphasize the importance of the learner's active participation in acquiring knowledge and skills. The horse-handling program is consistent with current developments in the field of embodied cognition, the claim that "cognitive processes are deeply rooted in the body's interactions with the world" (Wilson, 2002, p. 625). With respect to learning, engagement with one's environment can facilitate learning, thereby stressing the importance of the active role learners play in understanding the world around them (Kontra, Golden-Meadow, & Beilock, 2012). Research has supported this idea; performing an action facilitates learning more effectively than simply watching someone else perform the action (Kontra, et al., 2012).

When applying the principles of embodied cognition to a community setting,

the experiential learning paradigm (Kolb, 1984) is informative. Experiential learning promotes that "learning is a continuous process grounded in experience" (Kolb, 1984, p. 27), involving "transactions between the person [the learner] and the environment (Kolb, 1984, p. 34). The Join-Up<sup>®</sup>-inspired program is an application of this framework, as learning is situated in doing and participating. In the current study, participants interacted with horses, using body language that facilitated cooperation and calmness. That is, they did more than passively watch demonstrations or videos or listen to lectures. Rather, participants directly experienced the principles they were exposed to during the course of the program and were able to practice those skills.

As previously explained, the goal of the horse-handling program was to promote non-violent interactions in both human-human and human-equine interactions. Research with female Guatemalan victims of violence supports the efficacy of experiential learning through movement and sport therapy in a related domain (Ley & Rato Barrio, 2011). Additional research suggests that movement and sport-centered therapy are culturally appropriate, thus contributing to the overall effectiveness of the approach (Ley & Rato Barrio, 2012). Results indicated after this active therapeutic experience, women reported better psychological health. This suggests experiential learning is useful both in a Guatemalan population and in addressing violence-related concerns. Experiential learning may have another advantage as well. Because people in general can experience and enjoy interacting with horses, it is less susceptible to the stigma associated with talk therapy (Brandt, 2013). Although prior literature in Guatemala has focused on the utility of experiential learning with the victims of violence (Ley & Rato Barrio, 2011, 2012), the current study proposes it be used as a way to reduce violence among

potential perpetrators and other community members.

### Current Study

The current study employed a Join-Up<sup>®</sup>-inspired curriculum in a rural Guatemalan community, Las Cumbres (a pseudonym), a community in the state of Chimaltenango. Because work with horses is a central part of community life in Las Cumbres, a training program with equines was implemented as the vehicle to promote themes of non-violence. Over the course of the multi-week intervention, two groups were trained sequentially to work with horses using the Join-Up<sup>®</sup>-inspired approach.

The primary purpose of the program was to improve the handling and care of the participants' horses and the purpose of the research was to assess changes in participants' attitudes and behaviors toward their horses as well as the transfer and application of the non-violent horse-handling to participants' interactions with others. In other words, the goal of the translational research was to promote horse-handling and family interactions that were friendly, humane, and nonaggressive and that avoid coercion or physical punishment. Multiple measures and sources including evaluation videos with the horses, interviews with participants and family members, and attitudes toward violence questionnaires were used to provide a diverse and in-depth assessment.

In order to assess the effectiveness of the program, a series of hypotheses were developed to answer the study's central question, "Can violent and aggressive behavior and attitudes toward horses and people be reduced through a Join-Up<sup>®</sup>-inspired horse-handling program?"

H1. Horses will be less reactive to handling after their owners receive the

program, as compared to horses' responses before the program began.

H2. Attitude measures will show less endorsement of the use of aggression, punishment, and coercion with wives, children, and horses after the program.

H3. Female relatives of participants will report changes in participants' behaviors that are consistent with the goals of the program.

### Methods

#### *Participants*

**Community.** The community of Las Cumbres with a population of 2300 is located in the state of Chimaltenango in highland Guatemala. Although the larger state includes both Spanish and Kaqchikel speakers ("*Idioma* [Language]", n.d.), Las Cumbres itself is entirely Spanish speaking. The community faces many challenges including a high illiteracy rate and widespread poverty. The economy is based on agriculture, with corn, beans, and other vegetables among the major crops ("*Economía* [Economy]", n.d.).

**Program participants.** Participants were drawn from individual volunteers from Las Cumbres who worked with horses in their daily lives. Although 21 participants started the program, three dropped out before the program was completed, leaving a final sample of 18. Participants ( $N = 18$ ) were mostly male ( $n = 16$ ) and included both adolescents ( $n = 10$ ,  $M_{age} = 15.70$ ,  $SD = .82$ ) and adults ( $n = 8$ ,  $M_{age} = 36.13$ ,  $SD = 13.45$ ), ranging in age from 15 – 58 years. The two female participants were adolescents. For the purpose of this description, adults were defined as those 18 and over at the start of the study, and thus able to provide informed consent for their participation. Adolescents

were those under 18 at the study's start, requiring parental consent, as well as their own assent, for participation.

**Focus group participants.** While program participants were mostly male community members, focus group participants represented the community's female voice; the focus group comprised 12 female relatives of participants, including wives ( $n = 2$ ), mothers ( $n = 6$ ), sisters ( $n = 4$ ), a daughter ( $n = 1$ ), and an aunt ( $n = 1$ ). Some of the focus group members had multiple relationships to horse program participants. For example, one focus group member was both the wife of an adult participant and the mother of an adolescent participant; a second focus group member was the sister of one participant and the daughter of a second participant. Focus group members ranged in age from 18-55 years ( $M_{age} = 38.15$ ,  $SD = 32$ ).

### *Measures*

#### *Pre and posttest measures.*

**Human-horse evaluations.** Evaluations of horse-human interactions were conducted with the horse of each participant at pretest and posttest; the procedure was based on the Test of Horse Welfare by Burn, Dennison, and Whay (2010), was video-recorded, and was coded independently by two raters.

**Stranger evaluation.** Horses were first evaluated on their reaction to being approached by a stranger who, in all cases, was highly familiar with horses, but unfamiliar to that particular horse. The first rating was a rating of alertness prior to being approached. Three codes were possible: apathetic/depressed, alert, or irritable/nervous (e.g., ears back, tail swishing, stomping). Horses were then rated on their reaction to approach by the stranger and to the stranger touching their chin. Both responses were scored using one of six

possible codes: (1) friendly, (2) no reaction, (3) moves head away, (4) moves body away, (5) irritable (i.e., ears back, tail swishing, stomping), or (6) aggressive (tries to kick or bite with ears back, rears).

**Owner evaluation.** Horses were then approached by the owners. Videos were coded on a series of five actions adapted from Wulf, Aurich, May, and Aurich (2012): the owner's approach, lifting the front right leg of the horse, touching the ears, putting on an unfamiliar halter, and introducing a saddle pad or blanket to the horse's back. All actions were scored using one of the six codes described above (friendly, no reaction, moves head away, moves body away, irritable, or aggressive).

**Inter-rater reliability.** Two raters coded each video independently. Weighted Kappa, for ordinal data, was calculated as an inter-rater reliability statistic for each of the eight behaviors described above (three from the stranger video and five from the owner video). Scores were combined across pretest and posttest to yield a single inter-rater statistic for each behavior. Interpretations of Kappa are based on Landis and Koch (1977). The average Kappa was .67 (substantial agreement). The lowest Kappa was .32 for the load (fair agreement), followed by ears and halter at .59 (moderate agreement), .62 for the lift, .65 for the owner approach, and .73 for the stranger approach, with the last three suggesting substantial agreement. Finally, the chin at .82 and horse alertness at 1.00 suggest almost perfect agreement and perfect agreement, respectively. Scores that differed for the two raters were then discussed and the consensus score used for analysis.

**Participant interviews.** Participants were interviewed at pretest and again at posttest about their past and present experiences with horses, as well as what they hoped to gain or had gained from the program. They also provided basic

demographic data at this time. Due to the type of information collected, the interviews were structured. During interviews, the violence measure (described below) was read aloud to participants.

**Attitudes toward violence scales.** A series of three established questionnaires were combined to form an overall measure of attitudes towards violence. The composite measure consisted of 23 items and assessed attitudes toward violence with horses (an adaptation of the Beliefs about Punishment Scale; Corral-Verdugo, Frías-Armenta, Romero, & Muñoz, 1995), children (a selection of items from the Corporal Punishment of Children subscales of the Velicer Attitudes Toward Violence Scale; Velicer, Huckel, & Hansen, 1989, as revised by Anderson, Benjamin, Wood, & Bonacci, 2006), and wives (a selection of items from the Inventory of Beliefs about Wife-Beating-Short Form; Saunders, Lynch, Grayson, & Linz, 1987, as synthesized by Macapagal & House, 2013). All items and responses were translated from English into Spanish by a bilingual member of the research team, with the translation checked and verified by two other bilingual members of the team and a third outside expert. Efforts were made, not only to translate accurately, but also to use Guatemalan Spanish, including local expressions that would be easily understood by the rural community members. During interviews, participants were first asked whether they agreed or disagreed with an item. If they agreed, participants were then asked if they agreed a lot (*mucho*) or just a little (*poco*). If they disagreed, participants were asked if they disagreed a lot or just a little. These sequential responses are useful in testing adolescents and persons from different cultural backgrounds who might not be familiar with the typical Likert scales (Rohner & Khaleque, 2005; Wichstrøm, 1995). Responses were then converted to a 4-point Likert scale with 1 (*strongly disagree*)

to 4 (*strongly agree*). Higher scores indicated stronger endorsement of violent attitudes. Internal reliability as measured by Cronbach's alpha was adequate at both pretest ( $\alpha = .80$ ) and posttest ( $\alpha = .74$ ) for the composite measure.

*Physical punishment of horses (adaptation of the Beliefs of Punishment Scale; Corral-Verdugo et al., 1995).* Six items were adapted from Corral Verdugo et al.'s scale to capture the acceptability of violent treatment of horses during training. Sample items included, "Punishment is the best way to correct the behavior of a horse" and "Hitting the horse will teach it to behave well."

*Corporal Punishment of Children subscale of the Velicer Attitudes toward Violence Scale (Velicer et al., 1989, as revised by Anderson, et al., 2006).* Six items were chosen from the Children subscale of the Velicer Attitudes toward Violence Scale to ascertain participants' attitudes toward the role of violence in child discipline. Sample items included, "Children should be beaten when they have a tantrum" and "Disobedience in children should be punished physically."

*Inventory of Beliefs about Wife Beating-Short Form (Saunders et al., 1987, as synthesized by Macapagal & House, 2013).* To assess participants' attitudes about wife beating, they answered 11 questions on the acceptability of husbands physically abusing their wives. Items included, "When a husband mistreats his wife, it is the wife's fault" and "A little violence from time to time from a husband toward his wife maintains the marriage." Four items were reverse-scored.

**Join-Up<sup>®</sup>-inspired curriculum.** The Join-Up<sup>®</sup>-inspired curriculum, based on Monty Roberts' program, teaches non-violent communication between humans and equines through the Join-Up<sup>®</sup> experience ("About Join-Up<sup>®</sup>", 2015; Roberts, 2002a, 2002b). According to Roberts (2002a, 2002b)

Join-Up<sup>®</sup> uses the horse's inherent methods of nonverbal communication and herd behavior. Humans learn to display calm and confident nonverbal behavior that facilitates the horse's acceptance of their leadership.

Participants in the current study participated in a 4-week session to experience Roberts' method of horse-handling. The first three sessions took place at the stables owned and maintained by a member of the research team. Thus, participants initially completed the exercises with unfamiliar horses. The final session and a closing ceremony took place in the participants' home community, Las Cumbres, where they worked with their own horses.

*Week 1.* During the first week, participants watched a horse-human Join-Up<sup>®</sup> demonstration. Then they practiced a human-to-human Join-Up<sup>®</sup> exercise in which participants learned about necessary body position and body language. Finally, they performed the Join-Up<sup>®</sup> exercise with a horse.

*Week 2.* The second session focused on emotional regulation and control of arousal when working with a horse. Participants first listened to a presentation and demonstration and then practiced those skills by grooming a horse. Desensitization, introducing scary objects to the horse in a progressive and non-coercive manner, was also demonstrated and practiced.

*Week 3.* The third session continued with training on desensitization and introduction of the Dually training halter. The Dually training halter, designed by Roberts, is a patented schooling halter that uses pressure and release to shape the horses' behavior. Participants viewed another desensitization demonstration and then practiced desensitization themselves and use of the halter with horses. In addition, they continued to practice the Join-Up<sup>®</sup>. As a token of appreciation of their participation in the program and as encouragement to continue practicing the grooming exercises, participants were given grooming brushes at the close of the session.



**Figure 1:** Join-Up<sup>®</sup> between a participant and his horse.

*Week 4.* In the fourth and final week, participants worked on the Join-Up® exercise with their own horses. See Figure 1 (previous page). They also completed posttest interviews and were recognized in a graduation ceremony where they were each given a certificate and a Dually halter.

### *Procedure*

The community representative to a local horse-welfare non-governmental organization (NGO) offered his community, Las Cumbres, to participate in the horse-handling program. The research protocol was reviewed and approved by the Saint Louis University IRB, a local ad hoc ethics committee that addressed the research participation of people and horses, and the Consejo Comunitario de Desarrollo (COCODE), the community governing body. Participant volunteers over 18 years of age were read the consent form aloud; those under 18 were read the assent form, and their parents the consent form. The confidentiality of the interview was emphasized and permission was obtained to photograph and videotape the human-horse evaluations.

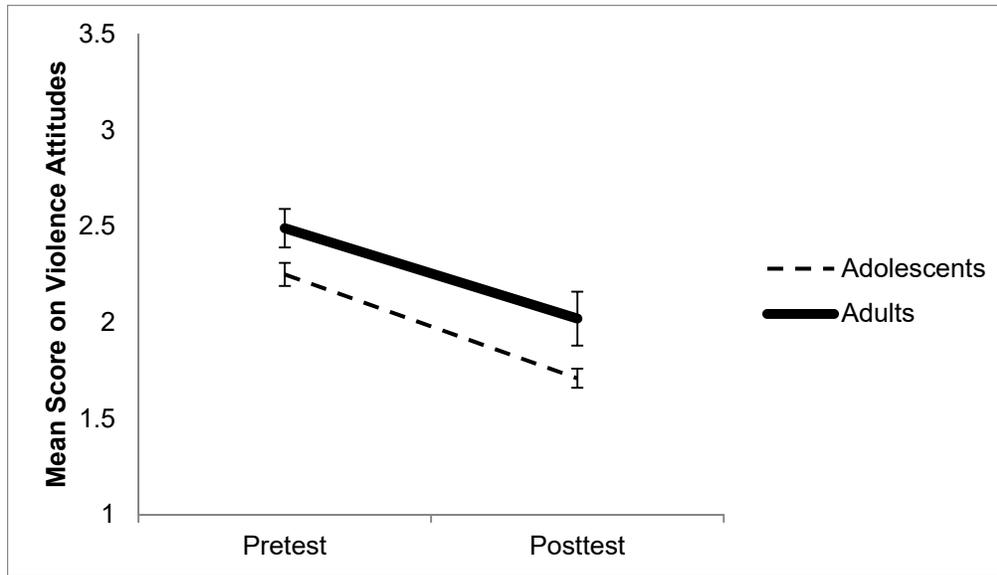
At pretest, participants and their horses were evaluated once with a stranger and the second time with the owner. The pretest took place immediately before the start of the program. Pretest evaluations with both the stranger ( $M = 49$  seconds,  $SD = 8$ ) and owner ( $M = 158$  seconds,  $SD = 130$ ) were brief. Participants also responded to questions regarding violent attitudes towards horses, children, and wives. Those questions were read aloud to participants during the interview in which they also provided demographic information and their background and experiences working with horses. As described above, the program lasted a total of 4 weeks. At posttest, horses were evaluated again with a stranger and the owner using the same protocol. Participants

were also re-interviewed at this time. Posttest evaluations and interviews occurred immediately after the end of the program. Again, evaluations with the stranger ( $M = 55$  seconds,  $SD = 16$ ) and owner ( $M = 147$  seconds,  $SD = 30$ ) were short.

In addition, female family members of the participants were invited to participate in a focus group. Wives, mothers, and sisters shared and explained any changes they had noticed in their family member's behavior or attitudes since participating in the program. They were asked specifically about any changes in the participants' behavior toward horses and family members. The focus group was conducted in a classroom in the local school one week after the end of the program and lasted 32 minutes. The focus group was audio recorded and transcribed. The dialogue was coded according to thematic analysis (see Braun & Clarke, 2006). Three members of the research team independently categorized statements extracted from the focus group transcript; all identified the primary three themes, and a small number of disagreements with respect to categorization were reconciled by discussion.

### *Study Design*

Originally, the study was designed as a randomized cross-over design and participants were randomly assigned to one of two groups. With this approach, participants are tested at three times: at pretest, after the first group receives the intervention, and finally, after both groups have received the intervention. Because of missing data, the design was simplified to a pretest/posttest analysis.



**Figure 2:** Mean scores on the measure of violent attitudes pre- and posttest for adolescents and adults. The error bars represent *SEM*.

## Results

The mixed-method design yielded both quantitative and qualitative data. The questionnaire data on attitudes toward violence were limited to the participants themselves, while the participant interviews and focus groups with wives and mothers provided other perspectives. In addition, the videos of stranger and owner evaluations with the horses provide a direct observation of the human-equine relations that were a major focal point of the project.

### *Attitudes Toward Violence Scales*

A 2 (Time: Pretest versus Posttest) x 2 (Age Group: Adolescent versus Adult) mixed model ANOVA was conducted to explore differences in attitudes toward violence between adolescents (15 through 17) and adults (those ages 18 and older). Time was analyzed as the within-subjects factor and adult versus adolescent status was the between-subjects variable. To assess sphericity, the Greenhouse-Geisser estimate

was used; it indicated sphericity was not violated ( $\epsilon = 1.00$ ). The main effect of time was significant with posttest scores lower than pretest scores,  $F(1, 16) = 56.58, p < .001$ , partial  $\eta^2 = .80$  indicating a decreased endorsement of violent attitudes after the program's conclusion. The main effect of age group was also significant, as adolescent participants were lower on endorsement of violent attitudes at pre- and posttest than adult participants,  $F(1, 16) = 5.98, p = .024$ , partial  $\eta^2 = .27$ . See Figure 2. The interaction between time and age group was not significant.

The means (depicted in Figure 2) indicated that on the pretest most participants endorsed violent and coercive ways to punish horses and children and to treat wives. On the posttest the average response was to reject such attitudes. For example on the pretest, 50% of participants agreed that "Punishing a child physically when he deserves it will make him a stronger, more responsible adult" compared to only 33.3% at posttest.

**Table 1:** Focus-Group Responses

	Theme	Example
What changes have you seen in participants?	A. Better care and treatment of horses (27 comments)	<p>“They work the horses less.”</p> <p>“He is different with his horse. He used to hit his horse a lot and no more. He is less angry.”</p> <p>“They would rather go without food themselves than not feed the animals.”</p>
	B. The participants themselves changed (21 comments)	<p>“He is more calm. Always smiling.”</p> <p>“They fight less.”</p> <p>“He scolded me a lot and now does less.”</p>
	C. Direct application of work with horses to people (6 comments)	<p>“Before he mistreated me and the mare and now he doesn’t.”</p> <p>“Now he is more loving with the family and the animals.”</p> <p>“When he has a conflict in the street, he tries to use what you taught him.”</p>

*Human -Horse Evaluations*

Wilcoxin signed-rank tests for ordinal data were used to assess potential differences between pretest and posttest scores. Because all horses were rated as alert unanimously by both coders at pretest and posttest, this variable was not analyzed further. Only the owner approach decreased significantly between pretest and posttest,  $Z = -2.04, p = .04, r = .34$  (medium effect). Despite not reaching traditional levels of significance, the other six behaviors were trending toward decreased reactivity.

*Posttest Interviews*

Participants’ posttest interviews revealed what they had learned from the program. Fifty percent indicated that they had learned to treat horses kindly and not to mistreat them. Remaining participants gave less specific answers. For example, one said, “I learned more about training horses.” When asked what they enjoyed most about the

program, 47% said the Join-Up® when participants experienced communicating with a horse without physical force. The remaining responses indicated participants enjoyed everything about the program (18%) and gained self-confidence (12%).

*Focus Groups with Wives, Mothers, and Sisters*

Following the horse-handling program, the focus group with some female relatives of the participants provided an alternate perspective about the program’s impact. The three themes that emerged in response to the question, “What changes have you observed in participants?” were participants’ more responsible and caring treatment of horses (27 comments), changes in participants themselves (21 comments), and a correspondence between the work with horses and changed interactions with people (6 comments). Examples of the themes can be found in Table 1.

## Discussion

Violence may be an everyday part of life for many youth in Guatemalan communities. One way that change might come about is through learning to handle horses in a gentle and non-coercive manner. In this study, an equine-facilitated program inspired by Monty Roberts' Join-Up® resulted in less endorsement of violence by participants, reports of better care of horses, less anger and aggression toward family members, and calmer responses from their own horses. A strength of the study was the use of three sources of information – the participants' self-reports, their female relatives' views, and horses' reactions to handling. The findings are consistent with other indications that horse-handling interventions may lessen anger expression, aggression, and violence (Kemp, et al., 2014; Nurenberg, et al., 2015; Schultz, et al., 2007; Trotter, et al., 2008).

This study is unique in that the program was endorsed by the community, bolstered by community involvement, and involved participants who already worked with horses in their daily lives. Because the participants learned better handling of their own working equines, with whom they formed a willing partnership, they were likely to realize economic benefits as well as psychological ones (Fundación Equinos Sanos Para El Pueblo, ESAP, 2010).

Like other equine-based programs, we saw the advantages of horses as talented facilitators of learning. Horses are social, sensitive to nonverbal cues, and authentic in their responses (Lentini & Knox, 2002). In order to perform an effective Join-Up®, as well as desensitize the horse to a frightening object, participants had to learn to display calm and confident nonverbal behavior. Thus, a likely mechanism for the changes observed in this study is improved emotion regulation, especially changing cognitions and modulating responses (Gross, 1998).

This explanation is consistent with a number of previous studies that implied improvements in emotion regulation following an equine-assisted intervention (Kemp, et al., 2014; Pearson, 1997; Trotter, et al., 2008). Future studies should specifically evaluate changes in the ability to regulate emotions among those receiving EFL programs.

There was evidence that horses, as well as their human companions, benefitted from the program. Family members reported that participants groomed, fed, and generally showed increased attention to their horses following the program. Moreover, on the posttest the horses themselves reacted more calmly to the approach of the owner.

Evidence suggests modifying simple, daily actions can have a lasting impact on future behavior and the current study was structured around similar logic. The participants in this study had daily routine interactions with their working equines, providing opportunities to practice what they were learning. The value of effecting change through changing daily habits is well documented in the health and nutrition literature. For example, simple dietary and activity modifications are associated with positive health outcomes (e.g., Golan, Fainaru, & Weizman, 1998).

In our study the program was effective for both youth and adults. Although young people were less likely than adults to endorse violent attitudes on either the pre- or posttest, the attitude changes occurred in both age groups. While equine-facilitated learning may be useful for people of all ages, youth may be at a critical juncture for negotiating their futures. Adolescence is an important stage for development of interpersonal relationships; entry into gangs or engaging in violence as an adolescent is associated with a bleak future (Dmitrieva, Gibson, Steinberg, Piquero, & Fagan, 2014; Gilman, Hill, & Hawkins, 2014). The ability to envision a

future without violence may aid in the construction of a different worldview, one that replaces physical punishment of children and wife battering with positive parenting and collaborative domestic relations. Moreover, adolescents have the opportunity to carry their acquired skills and knowledge forth to new generations.

Despite its strengths, this study has many limitations. The design could not be executed as planned, and the pre-post design retained many threats to internal validity. Because the community members were actively engaged in buying and selling horses, only 10 of the 18 participants completed the posttest with the same horse as their pretest. In addition, the design did not allow us to address the essential elements for change. Were community involvement, positive interpersonal relationships with the research team, increased emotional regulation and perceived control, economic benefits, or the specific non-violent leadership inspired by Join-Up® necessary and/or sufficient to result in the observed changes? Participants reported that the Join-Up® experience itself was powerful and life-changing, but further research is needed to reveal the specific outcomes of that experience, and how it transformed attitudes and behavior.

Another issue is that of sustainability. The program was resource-heavy, requiring a great deal of time, money, and other resources. Transportation to and from the rural community was difficult for the research team and for participants. NGO's interested in implementing an equine-facilitated learning program would be hard-pressed to invest the necessary resources. Shorter and more sustainable models should be tested to evaluate whether they would result in similar outcomes as the model tested here.

In sum, this research adds to the accumulating evidence that equine-facilitated interventions can positively transform

individuals and communities. However, many questions remain before programs can be considered to be empirically grounded and sustainable. Future research is needed to identify the critical elements of the program and to specify the population for which and the contexts in which an equine handling program is effective in reducing violent attitudes and behavior.

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