

2-1-2013

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### Recommended Citation

Pendry, P., Roeter, S., Smith, A., Jacobsen, S., & Erdman, P. (2013). Trajectories of Positive and Negative Behavior During Participation in Equine Facilitated Learning Program for Horse-Novice Youth. *The Journal of Extension*, 51(1), Article 34. <https://tigerprints.clemson.edu/joe/vol51/iss1/34>

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## Trajectories of Positive and Negative Behavior During Participation in Equine Facilitated Learning Program for Horse-Novice Youth

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**Abstract:** *To explore the efficacy of equine programming to support positive behavioral development of horse-novice youth, researchers examined trajectories of behavioral change of 5-8th grade students as they participate in an equine facilitated learning program. Behaviors were rated and analyzed to examine group trajectories of change. Results indicated significant increases and decreases in mean levels of participants' positive and negative behaviors respectively ( $M_{pos} = 17.13, p = .000$ ;  $M_{neg} = 4.76$ ;  $p = .005$ ). Additionally, researchers describe how program principles can be incorporated into 4-H curricula, expanding positive youth development opportunities for horse-novice and horse-experienced youth.*

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### Introduction

Building human capacity for living a happy and fulfilled life is one of several objectives of Extension's mission. One way in which Extension accomplishes this objective is through facilitation of 4-H positive youth development programs, such as animal science programming, which are dedicated to promoting the understanding of American agriculture. While one purpose of 4-H animal projects is to engage youth in agricultural industries and teach them how to raise, fit, and exhibit their animals, another goal is to support positive youth development, through working and learning in partnership with caring adults (4-H.org).

Although 4-H animal projects are theoretically available to youth from non-agricultural backgrounds, the "accessibility" of animal projects

and the nature of engagement in such projects varies significantly depending on the animal of interest (e.g., rabbit versus steer) and the ability of parents and program volunteers to provide access and guidance to youth. This is especially apparent in the case of equine programming, which is predominantly attended by youth from "horse experienced" backgrounds, (i.e., horse ownership) and provides little access to horse-novice youth. This is unfortunate, because participation in equine facilitated activities is thought to enhance youth well-being (Cole, 2005; Anderson & Karr-Lilienthal, 2011; Saunders-Ferguson, Barnett, Culen, & TenBroeck, 2008) and development, as evidenced by negative associations with internalizing and externalizing behavior problems (Trotter, Chandler, Goodwin-Bond, & Casey, 2008) and positive effects on child social competence (Pendry & Roeter, under review; Pendry, Roeter, & Jacobson, 2011).

To explore the efficacy of utilizing equine programming to support positive behavioral development among horse-novice youth, researchers examine the behavior of 5-8th grade horse-novice youth as they participate in an 11-week equine facilitated learning program aimed at enhancing social and behavioral competencies. In addition to examining patterns of youth behavior, researchers explored how program principles can be incorporated by Extension personnel into existing 4-H equine curricula and how doing so may expand positive youth development opportunities for horse-novice and horse-experienced youth.

## The Program

The program under study was PATH to Success—an equine facilitated learning program conducted at a Premier Accredited Center of the Professional Association of Therapeutic Horsemanship, Intl (PATH Intl.) at Washington State University. The program, designed for youth without mental or physical disabilities, aims to facilitate positive youth development through an 11-week session of once-weekly, 90-minute lessons of individual, team, and group-focused equine facilitated activities. The lessons—designed with horse-novice participants in mind—were piloted and implemented with 5th-8th grade students from area schools for 3 years before the study was conducted.

Under supervision of a PATH-certified instructor/equine mental health specialist, the program was implemented by a team of trained horse-experienced volunteers, many of whom had previously participated in 4-H equine programming, and/or other equine related youth organizations (e.g., Pony Club, Junior Rodeo, State High School Equestrian Clubs). Weekly lessons were based on principles of equitation science and natural horsemanship (McGreevy & McLean, 2007; 2010), featuring a combination of mounted and un-mounted activities and horse-human interactions, including observation of equine behavior, engagement in equine management (e.g., grooming), in-hand horsemanship activities, some riding, and personal and group reflection activities. Using human equine interactions as an analogy, program facilitators encouraged children to reflect on their behavior, thoughts, feelings, and communication skills and apply these to communication and collaboration with a human partner, resulting in positive behavioral change. A description of weekly program objectives and a selection of sample activities are contained in Table 1.

**Table 1.**  
Outline of Lesson Objectives by Week

Week	Lesson Objective	Sample Activity
1	Basic safety: Meet horses and staff	Observing horse behavior and herd dynamics
2	Respect: Self, others and horses	Moving horses using 4 phases of pressure
3	Communication: Verbal and non-verbal	Leading horses, interpreting horse body language
4	Leadership: Assertive and aggressive cues	Driving activity using body language and phases
5	Trust: Coping with perceptions of stress	Riding and leading
6	Boundaries	Driving activity using indirect pressure
7	Overcoming challenges and building confidence	Desensitizing horses
8	Enhancing self-regulation and relaxation	Horse massage, riding
9	Prepare for parents/visitors day	Incorporating horsemanship skills for team challenge
10	Parents/visitors day	Participants 'teach' parents horsemanship skills
11	Program wrap up	Obstacle course, riding and reflection

## Method

### Procedures

The study was reviewed and approved by the University Committee on Research Involving Human Subjects at Washington State University. Program participants were recruited through distribution of flyers and advertisements, information meetings in schools and the community, and referral by school counselors. Criteria for program participation were that children 1) were able to communicate effectively in English;

2) did not have a serious physical or mental disability, 3) were in 5th-8th grade, and 4) had not previously participated. Researchers recruited a total of 64 interested children from 10 different schools in the broader Pullman, WA area [(N boys = 37; N girls = 27; M age = 10.93 yrs; N 5th grade = 30, N 6th grade = 21, N 7th grade = 5, N 8th grade = 8; N referred = 10)]. Children were assigned to teams that included one equine, two child participants, an equine-experienced volunteer, and program facilitator. Each day, a total of eight child participants—divided across four equine teams—attended. The program was conducted four times per week, serving 32 children in each 11-week session. The results are based on data collected over two, 11-week sessions from a total of 64 children.

## Measures

During each session, participants' positive and negative behaviors were rated using the Animal Assisted Therapy—Psychosocial Session Form (AAT-PSF; Chandler, 2005). Each child's behavior was rated by a program facilitator who worked with the child each week and a trained, independent observer, resulting in approximately 22 behavioral reports per child. Raters indicated the extent to which children engaged in 25 positive behaviors (e.g., following direction, accepting feedback, sharing, making eye contact, appropriately assertive) and 18 negative behaviors (e.g., argumentative, fidgeting, withdrawn, hyperactive, resistant) on a 6-point Likert scale ranging from 0 (*none*), 1 (*very low*), 2 (*low*), 3 (*medium*), 4 (*high*) to 5 (*very high*). Summed scores for participants' positive and negative behaviors were averaged across observers, whose ratings were positively associated ( $r = .867$ ,  $p = .000$ ), resulting in a composite score of positive and negative behavior for each participant for each week.

In order to examine whether trajectories of change in positive and negative behavior differed depending on children's initial levels of social competence, each child's parent was asked to complete the Devereux Student Strength Assessment (DESSA; LeBuffe, Shapiro, & Naglieri, 2009), a behavior rating scale that assesses social-emotional competencies. The measure contains 72 items asking parents to indicate how often various child behaviors have occurred in the last month on a 5-point Likert scale ranging from 0 (*never*), 1 (*rarely*), 2 (*occasionally*), 3 (*frequently*), to 4 (*very frequently*) over the last month. The DESSA features a social competence composite score derived from averaging scores from 8 subscales, including Optimistic Thinking ( $\alpha = .87$ ), Self-Management ( $\alpha = .86$ ), Goal-Directed Behavior ( $\alpha = .89$ ), Self-Awareness ( $\alpha = .82$ ), Social-Awareness ( $\alpha = .81$ ), Personal Responsibility ( $\alpha = .87$ ), Decision Making ( $\alpha = .91$ ), and Relationship Skills ( $\alpha = .93$ ).

Composite scores were converted to T-scores using the accompanying coding procedure leading to the categorization of children into 3 groups ranging from low to high (0-40 = *needs instruction*, 41-59 = *typical*, and 60-72 = *strength*). Descriptive analyses revealed that average levels of pretest social competence for children in the study sample were in the normal range ( $M = 41.41$ ;  $SD = 10.16$ ), but that approximately half of the study sample was classified as needing instruction in social competence ( $N_{\text{needs instruction}} = 30$ ,  $N_{\text{typical}} = 31$ ,  $N_{\text{strengths}} = 3$ ). Because there were significant differences in pretest levels of child social competence by gender [ $(p = .010$ ;  $M_{\text{boys}} = 37.63$  (9.03);  $M_{\text{girls}} = 44.16$  (10.16)] and referral status [ $(p = .009$ ;  $M_{\text{referred}} = 34.45$  (6.85);  $M_{\text{unreferred}} = 43.08$  (10.14)], researchers also examined whether rates of behavioral change for positive and negative behavior differed by these characteristics.

## Results

Researchers first conducted t-tests comparing means of positive and negative behavior throughout the 11-week period, which indicated that participants demonstrated higher levels of positive than negative behavior ( $M_{\text{pos}} = 80.32$ ;  $SD = 16.99$ ;  $M_{\text{neg}} = 8.82$ ;  $SD = 8.00$ ). Researchers also found significant increases in mean levels of participants' positive behaviors ( $M_{\text{pos}} = 17.13$ ,  $p = .000$ ) and significant decreases in negative behaviors ( $M_{\text{neg}} = 4.76$ ;  $p = .005$ ) from the beginning to end of the program. For plotted means of positive and negative behaviors by week, see Table 2 and Figure 1.

**Table 2.**

Mean Levels of Observed Positive and Negative Participant Behavior by Week and Significance Level of Bi-Weekly Change

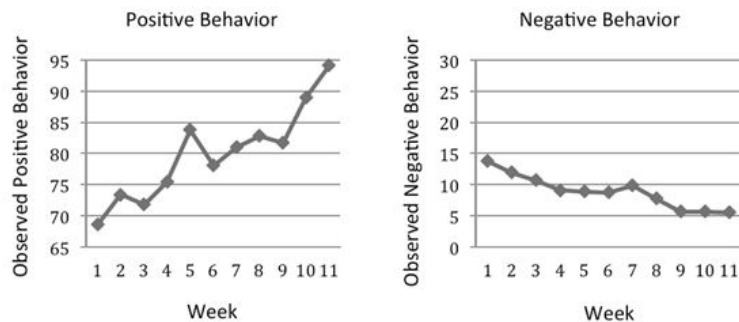
Week	Positive M (SD)	Change (p-value)	Negative M(SD)	Change (p-value)
1	68.65 (11.58)		13.85 (7.84)	
2	73.39 (13.99)		12.03 (8.63)	
3	71.77 (13.65)	.008**	10.74 (7.91)	.007**
4	75.39 (15.29)	.889	9.11 (6.4)	.421
5	83.76 (15.50)	.000***	8.91 (8.74)	.047*
6	78.06 (20.02)	.157	8.82 (8.04)	.006**
7	80.96 (13.87)	.898	9.93 (8.13)	.644
8	82.85 (14.59)	.004**	7.76 (7.42)	.038*

9	81.67 (13.65)	.405	5.71 (6.62)	.001**
10	88.98 (16.54)	.023*	5.72 (6.76)	.384
11	94.18 (18.04)	.000***	5.54 (7.22)	.537

Note. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$

Figure 1.

Trajectories of Observed Behavior of 5th-8th Grade Participants in an 11-Week Equine Facilitated Learning Program



In order to calculate a parameter representing each participant's individual trajectory of change over the 11-week period, researchers used techniques of multiple linear regressions in which each child's total weekly score of positive and negative behavior was regressed—predicted—by session number (i.e., 1 through 11). This resulted in a series of regression coefficients representing a linear estimate of the slope value for each child's individual trajectory, a value that was used as our outcome variable. Researchers used these slope estimates to examine whether trajectories of behavioral change were significantly different from zero, and whether they varied by child gender, referral status, and child social competence by conducting a series of one-way ANOVAs.

Results showed no significant differences in trajectories of change in positive ( $p = .453$ ) or negative behavior ( $p = .096$ ) based on child gender. Findings indicated that while upward trajectories of positive behavior for children who were referred by school counselors ( $p = .372$ ) were similar to those who were not, referred children experienced slightly stronger downward trajectories of negative behavior ( $p = .047$ ) than non-referred children. Researchers did not find statistically significant group differences in the trajectory of change in positive ( $p = .564$ ) or negative ( $p = .811$ ) behavior based on children's initial levels of social competence (i.e., low, medium, high).

## Discussion

First and foremost, the study reported here illustrates that 5th-8th grade, horse-novice children gradually increased amounts of positive behaviors and decreased amounts of negative behaviors as they participated in an 11-week equine facilitated learning program. The findings also suggest that there were no differences in the rate by which children demonstrated positive behavioral changes based on child gender, referral status, or beginning levels of social competence. Children who were referred by school counselors did appear to have steeper declines in negative behavior than non-referred children, suggesting that referred children experienced slightly greater improvements during program participation. The findings suggest that equine facilitated learning programs, such as PATH to Success, may be a suitable avenue to support positive development of horse-novice youth.

Incorporating equine facilitated learning (EFL) approaches may also nicely complement existing equine-centered educational programming efforts directed towards 4-H horse-experienced youth. First, with proper training, horse-experienced youth can assist with the implementation of EFL activities and mentoring of horse-novice youth. Equine programming leaders could incorporate educational training regarding the facilitation of EFL activities into their curriculum, providing a framework for youth to share natural horsemanship knowledge and skills with others, learn about program facilitation, and directly mentor youth through experiential learning activities. Encouraging youth to participate in such mentoring activities aligns nicely with 4-H directives of providing service to community as well as the principles of character development.

Second, incorporating principles of natural horsemanship into equine activities enhances knowledge of horse behavior and herd dynamics (e.g., prey-animal orientation, body language, expectations regarding leadership) and fosters horse-handling skills, complementing those encouraged in existing 4-H equine activities (e.g., 4-H camp, recreational riding, horse judging, horse knowledge bowl). Through training and exposure to equine facilitated learning, youth may learn about ways in which horse-human interactions and human animal interaction in general are thought to inform human and community development. Combined, a curriculum facilitating the development of the aforementioned knowledge and skills could incorporate a competency-based assessment tool, giving youth opportunities to demonstrate this knowledge and skill. These activities could also provide opportunities to compete by creating events that center on youths' horsemanship skills or demonstrations thereof.

In sum, this article encourages 4-H leaders involved in equine programming to consider incorporating principles underlying equine facilities growth and learning approaches into existing equine curricula. Doing so will expand participation in equine programming by horse-novice youth, broaden the scope of equine-related knowledge and skills of horse-experienced youth typically engaged in equine programming, and support general goals of Extension and 4-H with regards to promoting positive youth development.

### Acknowledgments

Researchers would like to acknowledge the receipt of research support from the National Institutes of Health, 1R03HD066590-01 to support the role of human animal interaction in child health and development (RFA-HD-12-105). We would also like to acknowledge Anna Montgomery, Alexa Carr, Leanne Parker, Dan Bailey, all PATH to Success volunteers, and HD-485 research assistants for their assistance in program implementation.

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