

An Evaluation of Therapeutic Horseback Riding Programs for Adults with Physical Impairments

Sarah Farias-Tomaszewski, Sharon Rae Jenkins, and Jean Keller

Several methods have been developed over the years that employ animals as adjuncts in psychotherapeutic interventions; therapeutic horseback riding is one such example. The purpose of this exploratory study was to assess the outcome of a 12-week therapeutic horseback riding program for persons with physical disabilities. Twenty-two adults with a variety of physical impairments were participants in a therapeutic horseback riding program. A one group pre-test/post-test design was used to evaluate changes in levels of physical and global self-efficacy. Behavioral indices of self-confidence also were collected over the course of the intervention on 18 of the 22 participants. Physical self-efficacy and behavioral self-confidence were found to increase from pre-test to post-test while global self-efficacy did not change over time. Findings from this exploratory study provide evidence in support of the psychological value of this type of intervention for adults with physical impairments.

KEY WORDS: *Therapeutic Horseback Riding, Adults with Physical Impairments, Physical Self-Efficacy, Global Self-Efficacy*

Sarah Tomaszewski, Ph.D. is completing a postdoctoral fellowship in neuropsychology through the Department of Neurology at the University of California, Davis; Sharon Rae Jenkins, Ph.D., is Associate Professor in the Department of Psychology, Clinical Program at the University of North Texas; and Jean Keller, Ph.D., is Professor in the Department of Kinesiology, Health Promotion and Recreation and Dean of the College of Education at the University of North Texas.

¹ The authors wish to express their appreciation to Karin Curtiss and Dana Farias, the primary research assistants involved in this study. We also wish to thank the staff at the following therapeutic horseback riding programs: Equest in Dallas, TX; Rocky Top Therapy Center in Keller, TX; and Riding Unlimited in Justin, TX.

Therapeutic horseback riding is one example of the implementation of companion animals in the treatment of individuals with emotional and/or physical disabilities. This type of intervention originated in Germany in the 1950s and since that time, numerous programs have sprung up throughout the world. According to the North American Riding for the Handicapped Association, there are over 464 programs currently in operation in the United States serving an estimated 23,000 individuals with disabilities (Potter, Evans, & Nolt, 1994). The psychological benefits espoused by advocates of therapeutic horseback riding include improved self-confidence, courage, motivation, as well as increased social involvement (Fox, Lawlor, & Luttes, 1983; Henriksen, 1971; Rosenthal, 1975). While therapeutic riding is presently being practiced at hundreds of sites in the United States and in numerous countries throughout the world, only a limited amount of systematic research has been undertaken to assess the therapeutic efficacy of this type of treatment.

The potential value of participating in a therapeutic riding program may be broadly divided into two main categories: physical and psychological. Substantial physical gains in posture, balance, arm and leg strength, coordination, and back and neck strength have been demonstrated (Bertoti, 1988; Biery & Kauffman, 1989; Brock, 1988; Haskin, Bream, & Erdman, 1982). However, much of the psychological benefit attributed to therapeutic horseback riding has been documented only through subjective and anecdotal reports. A total of six studies were found that utilized objective, empirically validated instruments to measure the psychological outcomes of participation in a therapeutic horseback riding program (Brock, 1988; Carlson, 1983; Crawley, Crawley, & Retter, 1994; Dismuke, 1984; Mason, 1988; Stuler, 1993). All of these studies investigated changes in self-concept and, overall, the findings are inconclusive. Two studies found an improvement in self-concept over the course of treatment (Dismuke, 1984; Mason, 1988) while four previous studies failed to find

statistically significant changes in self-concept (Brock, 1988; Crawley et al., 1994; Stuler, 1993). One study, in addition to assessing changes in self-concept, also investigated changes in locus of control and found a shift from a more external to more internal locus of control after completion of a therapeutic horseback riding program (Carlson, 1983).

The purpose of the present exploratory study was to examine the possible psychological benefits of therapeutic horseback riding in a group of adults with physical disabilities. Pretest and posttest measures included both physical and global self-efficacy. Physical self-efficacy was defined as perceived competence in performing behaviors involving physical skill as well as confidence in one's physical self-presentation (Ryckman, Robbins, Thorton, & Cantrell, 1982). Global self-efficacy measured general efficacy expectations not limited to physical abilities. Additionally, in order to measure the overt changes in behavior that may accompany the cognitively-based changes in self-efficacy, observational behavioral ratings of self-confidence were also obtained. It was hypothesized that both physical and global self-efficacy, as well as observer-based ratings of self-confident behavior would increase over the course of the 12 week therapeutic riding program.

Method

Participants

Participants consisted of 22 adults with physical disabilities who were enrolled in a therapeutic horseback riding program. Individuals ranged in age from 17 to 61 years-old, with a mean age of 40 years; 15 participants were female (68.2%) and 7 were male (31.8%). All participants were Caucasian. Participants in this study had the following physical disabilities: multiple sclerosis ($n = 13$), a history of closed head injury with concomitant physical impairments ($n = 3$), spinal cord injury ($n = 4$), cerebral palsy ($n = 1$), and scoliosis ($n = 1$). Sixty percent of the participants were new to this type of therapeutic

program; of those who had previously been in a therapeutic riding program, the average length of time was 13.6 months.

Measures

The Self-Efficacy Scale. The Self-Efficacy Scale (Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs, & Rogers, 1982) is a 23-item self-report questionnaire measuring general or global self-efficacy. It utilizes a 5-point scale, anchored by "strongly disagree" to "strongly agree"; higher scores are associated with better self-efficacy expectations. The scale was designed to measure generalized expectancies (feelings of competence) not specific to a particular situation or behavior. Examples of questions that make up this scale include: *When I set important goals for myself, I rarely achieve them* and *If I can't do a job the first time, I keep trying until I can*. Cronbach alpha reliability coefficients range from .71 to .86. High correlations between the Self-Efficacy Scale and several instruments that measure similar personality constructs (i.e. locus of control, interpersonal competence, and self-esteem) provide evidence of its construct validity (Sherer et al.).

The Physical Self-Efficacy Scale. The Physical Self-Efficacy Scale (Ryckman et al., 1982) is a 22-item self-report questionnaire evaluating an individual's perceived competence in performing behaviors involving physical skill and level of confidence in displaying such abilities. It utilizes a 6-point scale with ratings that range from "strongly agree" to "strongly disagree", a higher total score reflects greater physical self-efficacy. Examples of questions that make up this instrument include: *I take little pride in my ability in sports* and *I don't feel in control when I take tests involving physical dexterity*. Test-retest reliability after a six-week interval was reported as .80 and internal consistency was reported as .81. High scores in physical self-efficacy have been correlated with higher self-esteem, an internal locus of control, lack of anxiety and self-consciousness, and a propensity to engage

in adventurous physical activity. High self-efficacy also has been found to be related to better performance on a physical task (Ryckman et al.).

Behavioral Rating Scale. The Behavioral Rating Scale was developed by the current investigators in order to assess overt behavioral indices of self-confidence in riding ability. This measure includes nine items on which a rating of one to seven is made; a composite score is obtained by summing all ratings. Higher scores indicate a higher degree of behavioral confidence exhibited. The scale was designed in order to measure observable behavior specific to the activity of horseback riding and therefore augment the self-report measures of self-efficacy. Some of the specific areas assessed by this measure include the participants' degree of reluctance to get on the horse, the degree to which participants took control of their own horse, and the degree of assistance required from volunteers and/or riding instructor during the lesson.

Two separate raters, the riding instructor and a research assistant who was naive to the hypotheses of the study, completed behavioral observations on a total of 18 of the 22 participants in the study. Inter-rater reliability between the behavioral ratings made by the instructor and naive rater was assessed using Spearman Rho correlation coefficients. A correlation of .87 between the two raters was obtained for the pre-test administration and a somewhat lower correlation of .65 was obtained at the post-test interval. In addition, matched sample t-tests revealed that the means of the two ratings were not significantly different at either the pre-test or post-test interval ($t = .24, p = .82$ for the pre-test and $t = 1.36, p = .19$ for the post-test). Cronbach's alpha internal consistency reliability for the instructors ratings were .95 (pre-test) and .86 (post-test), and for the naive rater they were .95 (pre-test) and .81 (post-test).

Demographic Questionnaire. Demographic information included the participant's age, gender, ethnicity, type of disability, and length of time with disability. In addition,

information was collected on whether participants were involved in other therapies or sporting activities.

Procedure

Data collection took place at three separate facilities that offered therapeutic horseback riding. Each program ran a total of 12 weeks. All three programs had a recreational and/or psycho-educational orientation. Programs that focused exclusively on physical rehabilitation were excluded from the study. Because each of the programs utilized in this study had very similar orientations regarding the goals of treatment, participants from each site were pooled and analyzed as one group. All of the riding instructors who participated in the current study had completed some type of formal training in therapeutic riding and thus had demonstrated some level of expertise in the area. The current study employed a one-group pre-test/post-test design (Campbell & Stanley, 1963). Participants were assessed on the first day of riding class and again on the last day of class, 12 weeks later. At each of the testing intervals participants completed the Self-Efficacy Scale (Sherer et al., 1982) and the Physical Self-Efficacy Scale (Ryckman et al., 1982). In addition, during both the first and last riding class, 18 of the 22 participants were rated on the level of confidence they exhibited while on the horse. Behavioral ratings were completed by two separate raters as described above. The behavioral assessment began at the inception of the mounting procedure, continued throughout the one hour lesson, and ended after the participant dismounted the horse. The Demographic Questionnaire was distributed (along with the other self-report measures) on the last day of class.

Data Analyses

Means and standard deviations were calculated for each measure; in order to evaluate the possible atypicality of this sample these means and standard deviations were compared to published norms for nonclinical samples when

Table 1.
Means and Standard Deviations of
Self-Efficacy Measures

	<i>M</i>	<i>SD</i>
(Global) Self-Efficacy Scale		
<i>Pre-test</i>	84.69	17.44
<i>Post-test</i>	85.23	15.03
<i>Norm^a</i>	85.51	—
Physical Self-Efficacy Scale		
<i>Pre-test</i>	73.62	14.51
<i>Post-test</i>	78.00	16.01
<i>Norm^b</i>	98.54	13.85

(a) Norm was based on responses from 101 undergraduate students, 45 males and 56 females (Sherer & Adams, 1983), no standard deviation for the sample was provided by the authors.

(b) Norm was based on responses from 363 undergraduate students enrolled in introductory classes (Ryckman et al., 1982).

available. Correlations between demographic variables and outcome measures were used to identify possible antecedents of self-efficacy and behavioral confidence. A repeated measures multivariate analysis of variance (MANOVA) was conducted on all pre- and post-test scores for global self-efficacy, physical self-efficacy, and behavioral ratings of self-confidence. Follow-up univariate analysis of variance was used to examine the degree of change between pre-test and post-test scores on each of the three repeated outcome measures. A .05 level of statistical significance was selected.

Results and Discussion

Self-report measures were collected on a total of 22 participants and behavioral ratings were obtained on 18 of these same individuals. The means and standard deviations for the pre-test and post-test administrations of the Physical Self-Efficacy Scale (Ryckman et al., 1982) and the Self-Efficacy Scale (Sherer & Adams, 1983) are presented in Table 1. Previously published normative data on these

Table 2.
Means and Standard Deviations for
Behavioral Self-Confidence Ratings

	<i>M</i>	<i>SD</i>
Instructor Rating		
<i>Pre-test</i>	45.69	15.32
<i>Post-test</i>	55.94	7.24
Naive Rating		
<i>Pre-test</i>	45.15	12.64
<i>Post-test</i>	53.50	7.92

measures are also included and are based on samples of undergraduate college students. Mean pre-test and post-test scores for this study's sample were in the average range on the Self-Efficacy Scale, when compared to the normative score. However, as a group, the participants in this study obtained mean pre-test and post-test scores on the Physical Self-Efficacy Scale that were more than one standard deviation below the normative mean. The means for pre-test and post-test administrations of the behavioral ratings for each rater are presented in Table 2. As this scale was developed specifically for the current study, no normative information was available.

Correlational analysis between demographic variables and outcome measures revealed that pre-test scores of physical self-efficacy were associated with length of time in the program ($r = .42$). Similarly, initial behavioral ratings made by both the instructor and the naive rater were also significantly correlated with length of time in the program ($r = .56$ and $.41$, respectively). Thus, the longer individuals had participated in therapeutic riding prior to the study, the higher their initial levels of physical self-efficacy and behavioral self-confidence. No other associations between demographic and outcome measures were significant.

Results of a multiple analysis of variance (MANOVA) indicated a significant increase in scores from pre-test to post-test ($F(17,1) =$

10.05 , $p = .006$) for the main effect of time. Follow-up analyses indicate there was a significant increase in physical self-efficacy over time as predicted ($F(21,1) = 4.99$, $p = .04$) but not in global self-efficacy ($F(21,1) = .01$, $p = .93$). Behavioral ratings made by both raters increased significantly from pre-test to post-test ($F(17,1) = 7.68$, $p = .013$) for the behavioral ratings made by the instructor, and for the ratings made by the naive rater ($F(17,1) = 12.09$, $p = .003$).

In this exploratory study, a small sample of adults with physical disabilities viewed themselves as having greater physical ability and displayed increased confidence in the presentation of their physical skills at the end of a therapeutic horseback riding program than they had at the beginning of the 12 weeks. The prediction that participation in a therapeutic horseback riding program would be related to improved physical self-efficacy was supported by these results. Additionally, the prediction that the study participants would demonstrate overt signs of increased self-confident behavior was also supported. This observation was made not only by one, but by two different judges: both the riding instructor and an independent rater judged the participants' behavior to be more self-confident on average at the end of treatment than it had been on the first day of class. However, because no control group was used for comparison, the cause of this change cannot be specified without further research.

Furthermore, initial (pre-test) measures of both physical self-efficacy and behavioral indices of self-confidence were found to be related to the length of time participants had been in the therapeutic riding program prior to the inception of the study. That is, the longer participants had been in this type of program, the higher their initial level of physical self-efficacy and behavioral confidence. These correlational findings are similar to those reported by Crawley and colleagues (1994) and further strengthen the main findings that individuals demonstrated increases in physical self-efficacy and overt self-confidence from pre-test to post-test. However, an alternative hypotheses

regarding both these cross-sectional correlations and the repeated measures of change would be that they reflect a self-selection bias, that is, those individuals with more confidence and physical self-efficacy may tend to stay in the program longer.

Despite participants' improved physical self-efficacy and self-confidence, the hypothesis that participation in a therapeutic horseback riding program would be associated with an increase in global self-efficacy was not supported by the results of this study. It has been suggested by previous researchers that global measures of self-efficacy are generally poorer predictors of actual behavior than activity or domain specific measures of self-efficacy (Bandura, 1981; Ryckman et al., 1982). These findings suggest that improved perception of one's physical competence may not generalize beyond the realm of physical activity. However, given that the population in this particular study had real physical disabilities, the improved perception of ones' remaining physical skills seems to be an appropriate target for intervention.

Intervention Implications and Future Directions

The findings of this study have several clinical implications for therapists involved in providing this type of treatment to individuals with physical disabilities. Improved perception of one's physical abilities and self-confidence may be possible benefits of this type of treatment, and thus programs should be structured in such a way as to best promote these changes. Self-efficacy theory asserts that expectations of efficacy are improved through experiences of success while engaging in activities that are perceived as challenging (Bandura, 1977). Therapeutic riding provides a good environment in which controlled challenges can be presented and repeated successes be experienced. One possible way to provide challenges during each riding lesson would be by utilizing novel tasks which are of moderate difficulty for the particular person's

level of skill. However, it is extremely important that the rider be able to achieve at least some degree of success while engaging in the exercise. Therapists should recognize and reinforce the improvements each individual makes both throughout the riding lesson as well as during brief discussion at the end of each lesson. Additionally, it is recommended that therapists/riding instructors meet with each individual periodically throughout the course of treatment to review improvements and outline future goals.

Other professionals involved in the field of rehabilitation may use referrals to this type of program as an adjunctive therapy in their treatment planning with persons who have physical disabilities. Participation in a therapeutic riding program will help individuals integrate both psychological and physical improvements into their rehabilitation. Because higher levels of self-efficacy have been associated with lower levels of anxiety and depression (Bandura, 1989; Bandura et al., 1982; Davis-Berman, 1988; Rosenbaum & Hadari, 1985), this type of treatment may help ameliorate some of the psychological distress brought on by a physical disability. In addition, motivation and overall investment in physical rehabilitation may increase if self-confidence and self-efficacy are enlisted to empower persons to actively participate in their treatment. Compliance with the rehabilitation program may also be increased by providing at least some of the treatment within a community-based setting.

It must be strongly emphasized that the present study was exploratory in nature. The pre-experimental research design employed in this study sets significant limitations on the conclusions that can be drawn from the current findings. Because no control group was utilized, changes in physical self-efficacy and behavioral confidence cannot be assumed to be directly attributable to the intervention. For example, maturation cannot be ruled out as a contributing factor; it may be that general life experiences outside of treatment, media campaigns about disability, and/or simply the pas-

sage of time led to an increase in physical self-efficacy and self-confidence. Regression toward the mean may also be a confounding variable. Participants in this study scored significantly below average (compared to a non-clinical sample) on the Physical Self-Efficacy Scale at the pre-test interval. Because this group was at the low end of the continuum to begin with, it would be expected that scores would migrate toward the mean on the second administration of this measure simply because of statistical regression. Future research should employ a research design with tighter controls over extraneous variables. A comparison group that does not receive the intervention would be useful. Ideally, participants who have no previous riding experience should be randomly assigned to either control or treatment group in a true experimental pretest-posttest design.

Another limitation to this study was the small sample size. Small samples limit the statistical power available to detect true differences attributable to treatment. Thus, some of the effects of the treatment may have been missed. This does not seem to be the case with regards to changes in physical self-efficacy and behavioral confidence both of which, despite a small sample, reached statistical significance. However, this may have been the case for changes in global self-efficacy; with a larger sample changes in global self-efficacy may have been statistically significant. A small sample size also limits the extent to which the sample adequately represented the population as a whole. The adults with physical disabilities in this study may not be representative of all such persons. To improve the generalizability of research results, future studies should employ a larger sample including individuals with a wider range of physical disabilities.

Past research has almost exclusively assessed changes in self-concept as a result of therapeutic riding. Since, to the authors' knowledge, this is the first study to evaluate changes in self-efficacy, future research should replicate the present findings. Self-

efficacy as it relates to physical abilities, rather than global efficacy, is likely to continue show the most change within this population.

Undoubtedly other psychosocial benefits, not systematically measured in this study, result from this type of treatment. Improvements in mental well being (e.g. decreased depression and/or anxiety), the opportunity to meet and socialize with others, to recreate, and to gain a sense of achievement, were all informally reported as benefits by many of the participants. Ultimately, each one of these areas should be assessed objectively as knowing the anticipated psychological benefits of this treatment modality would enable therapeutic horseback riding programs to most effectively develop treatment plans for the individuals they assist.

References

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bandura, A. (1981). Self-referent thought: A developmental analysis of self-efficacy. In J. H. Flavell & L. D. Ross (Eds.), *Cognitive social development: Frontiers and possible futures*. New York: Cambridge University Press.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44, 1175-1184.
- Bandura, A., Reese, L., & Adams, N. E. (1982). Microanalysis of action and fear arousal as a function of differential levels of perceived self-efficacy. *Journal of Personality and Social Psychology*, 43, 5-21.
- Bertoti, D. (1988). Effects of therapeutic horseback riding on posture in children with cerebral palsy. *Journal of Therapy*, 58, 1505-1511.
- Biery, M. J., & Kauffman, N. (1989). The effects of therapeutic horseback riding on balance. *Adapted Physical Activity Quarterly*, 6, 221-227.
- Brock, B. (1988). Effects of horseback riding on disabled adults. *Therapeutic Recreation Journal*, 20, 35-42.
- Campbell, D. T., & Stanley, J. C. (1963). *Exper-*

imental and quasi-experimental designs for research. Boston: Houghton Mifflin Company.

Carlson, E. (1983). *The effects of a program of therapeutic horsemanship on the self-concept and locus of control orientation of the learning disabled* (Doctoral dissertation, United States International University). University Microfilms International 8310174.

Crawley, R., Crawley, D., & Retter, K. (1994). Therapeutic horseback riding and self-concept in adolescents with special educational needs. *Anthrozoos*, 7, 129–134.

Davis-Berman, J. (1988). Self-efficacy and depressive symptomatology in older adults: An exploratory study. *International Journal of Aging and Human Development*, 27, 35–43.

Dismuke, R. P. (1984). Rehabilitative horseback riding for children with language disorders. In R. H. Anderson, B. L. Hart, & L. A. Hart (Eds.), *The pet connection* (pp. 131–140). Minneapolis: University of Minnesota.

Fox, V. M., Lawlor, V. A., & Luttes, M. W. (1984). Pilot study of novel test instrumentation to evaluate therapeutic horseback riding. *Adapted Physical Activity Quarterly*, 1, 30–36.

Haskin, M., Bream, J. A., & Erdman, W. J. (1982). The Pennsylvania horseback riding program for cerebral palsy. *American Journal of Physical Medicine*, 61, 141–144.

Henriksen, J. D. (1971). Horseback riding for the handicapped. *Archives of Physical Medicine and Rehabilitation*, 52, 282–283.

Mason, M. J. (1988). *Effects of a therapeutic riding program on self concept in adults with cerebral palsy*. Unpublished doctoral dissertation, New York University, New York.

Potter, J. T., Evans, J. W., & Nolt, B. H. (1994). Therapeutic horseback riding. *Journal of the American Veterinary Medical Association*, 204, 131–133.

Rosenbaum, M., & Hadari. (1985). Personal efficacy, external locus of control, and perceived contingency of parental reinforcement among depressed, paranoid, and normal subjects. *Journal of Personality and Social Psychology*, 49, 539–547.

Rosenthal, S. R. (1975). Risk exercise and the physically handicapped. *Rehabilitation Literature*, 36, 144–149.

Ryckman, R., Robbins, M., Thorton, B., & Cantrell, P. (1982). Development and validation of a physical self-efficacy scale. *Journal of Personality and Social Psychology*, 42, 891–900.

Sherer, M., & Adams, C. (1983). Construct validation of the self-efficacy scale. *Psychological Reports*, 53, 899–902.

Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rodgers, R. (1982). The self-efficacy scale: Construction and validation. *Psychological Reports*, 51, 663–671.

Stuler, L. R. (1993). *The impact of therapeutic horseback riding on the self-concept and riding performance of children and adolescents with disabilities*. Unpublished master's thesis, Pennsylvania State University, Pennsylvania.