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Danielle Y. Clark

Gannon University, clark057@gannon.edu

Julia M. Mack

Gannon University, mack009@gannon.edu

Kenneth G. McCurdy

St. Bonaventure University, kmccurdy@sbu.edu

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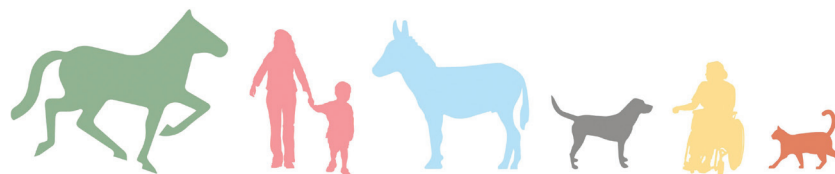
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Cover Page Footnote

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Can an Equine-Assisted Learning Course Improve Emotional Intelligence in Undergraduate Students?

Danielle Y. Clark,¹ Julia M. Mack,¹ Kenneth G. McCurdy²

Keywords: emotional intelligence (EI), equine-assisted learning (EAL), interpersonal skills, undergraduate students

Abstract Background: Emotional intelligence, a construct that many experts consider an essential component of life success, is moving in a concerning direction among American college students. Equine-assisted interventions may be an innovative modality for influencing these skills. **Purpose:** This study explores the effectiveness of a 15-week equine-assisted experiential learning course on emotional intelligence among undergraduate college students. **Methodology/Approach:** The intervention group consisted of 18 students who participated in a three-credit psychology course entitled Horses for Interpersonal Skills, which involved classroom instruction and an equine-assisted learning (EAL) component. This group was compared to a no intervention sample of 26 students enrolled in a three-credit lecture-based introductory psychology course. **Findings/Conclusions:** Emotional intelligence scores were compared at baseline and post intervention for both groups. While results were not significant, this study found that trait emotional intelligence scores as measured by the Trait Emotional Intelligence Questionnaire, Short Form (TEIQue-SF) increased by 10 points among students enrolled in the EAL course, compared to the control group whose emotional intelligence increased by a half point over a 15-week period. **Implications:** Results of this small study suggest that emotional intelligence can be changed and enhanced in the short term. The EAL course may serve as an early template for future programs interested in more critical exploration of EAL as a unique intervention for college students to develop and refine essential interpersonal skills.

(1) Gannon University, (2) St. Bonaventure University

IAHAIO

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Introduction

Emotional Intelligence

Credited with introduction of the term “emotional intelligence” (EI) in the scientific literature, researchers Mayer, Salovey, Caruso, and Cherkasskiy define it as “the ability to perceive and express emotion, assimilate emotion in thought, understand and reason with emotion, and regulate emotion in the self and others” (Sternberg & Kaufman, 2011, p. 528). While conventional intelligence undeniably plays a role in success and well-being, “it rarely explains more than one third to one half of the variance on any outcome measure be it academic achievement, job performance or health” (Furnham, 2012, pp. 3–4). This leaves the remaining 50 to 70 percent of variance attributed directly to EI, which is illustrated by the idea that while many jobs require cognitive and manual labor, others require emotional insight and awareness, and emotions are essential for cognition (Furnham, 2012; Perez, 2022).

A convincing amount of evidence suggests that EI can be changed and effectively taught using experiential approaches and is correlated with important life outcomes including academic and occupational performance, social interaction, and coping with serious medical conditions (Bar-On, 2010; Goroshit & Hen, 2012; Serrat, 2017).

It bears noting that equally compelling research is critical of the idea of EI, most notably, Waterhouse’s 2006 review of the theory questioning its validity as a construct, observing a lack of differentiation from personality plus IQ, and lack of evidence that EI is associated with real-world success. In response, proponents cite consistent and reliable evidence demonstrating the positive impact of programs that foster social and emotional learning on social, emotional, behavioral, and academic outcomes (Greenberg, 2023).

How Much Does EI Matter?

EI exerts an influence across ages, and social and emotional learning has been referred to as the “missing piece” in education (Perez, 2022). For children, the importance of such skills is evident in recent

approaches to prevent bullying, low-level aggression, and later, the school-to-prison pipeline (Osher et al., 2016). In young adults, reviews and meta-analyses recognize EI as a highly relevant and important requirement for academic leadership and success in higher education, including medical education (Devenci & Nunn, 2016; Emanuel & Gudbranson, 2018; Parrish, 2015). Its value continues later in life in health care administration and in predicting overall career satisfaction (Freshman & Rubino, 2002; Urquijo et al., 2019).

EI is also an essential component of healthy personal relationships in which skills like empathetic perspective taking, self-monitoring in social situations, and cooperation contribute to close affectionate bonds and marital satisfaction (Schutte et al., 2001).

Despite the established significance of this competency across ages and domains, closer examination of EI reveals a concerning trend pertinent to the current study. While Americans’ mean IQ scores have risen by almost 30 points from 1900 to 2012, a 40% decline in empathy in American undergraduate students has been documented from 1979 to 2009 (Konrath et al., 2011; Winerman, 2013). *Empathy*, defined as “the ability to understand someone from his or her frame of reference rather than one’s own” (APA, 2020a), is an essential element in all theoretical perspectives of EI. In a cross-temporal meta-analysis of 13,737 American college students, Konrath et al. (2011) found significant declines in two specific components of EI, perspective taking and empathic concern. *Perspective taking* is “looking at a situation from a viewpoint that is different from one’s usual viewpoint” (APA, 2020b) and *empathetic concern* is “an emotional response of compassion and concern caused by witnessing someone else in need” (Niezink et al., 2012, p. 545). The authors speculate on societal trends that may be associated with this decline, including but not limited to a corresponding rise in narcissism, greater interest in amassing wealth than in helping others, increases in violence and bullying, and declining social skills due to the “rising prominence of personal technology” (p. 188). More recent data on the state of American students notes that more than 80% of public schools reported “stunted behavioral

and social-emotional development in their students because of the Covid-19 pandemic” (Arizona State University Mary Lou Fulton Teachers College, 2023, p. 7). These findings have distressing implications for individual and societal well-being given the significant role of empathy as a determinant of success in forming and maintaining healthy working and personal relationships (Burgon, 2011).

Equine-Assisted Learning

Equine-assisted learning (EAL) is a subset of the broader field of equine-assisted services (EAS), which, while there is incomplete consensus on the use of the term, generally refers to a diverse range of interventions during which the physical and emotional relationship between humans and horses influences human health and well-being (De Santis et al., 2017; Fine & Andersen, 2021). According to the Professional Association of Therapeutic Horsemanship, International (PATH International, 2022) three distinct categories of services exist: equine-assisted therapy (EAT), horsemanship, and EAL. EAT involves licensed practitioners and a focus on the rehabilitative goals of the client. Horsemanship includes therapeutic riding, grooming, and stable management. EAL is an experiential learning approach with the purpose of “promoting the development of life skills for educational, professional, and personal goals through equine-assisted activities” (para. 3). This modality focuses on learning as “the process whereby knowledge is created through the transformation of experience” (Kolb, 1984, p. 38 as cited by Sugarman, 1987). EAL is used at all educational levels, and research suggests it promotes self-efficacy and life skills, professional development such as team building and collaboration, and personal growth that impacts one’s self-awareness and interpersonal relationships (Bilginoglu, 2021).

Why Horses?

Compared to other popular therapy animals, horses are uniquely effective in teaching social and emotional skills in part due to their imposing size, which

demands a mindful presence from those engaging with them, and due to the proposal that horses may have developed some level of emotional intelligence themselves (Brandt, 2005; Marchand, 2023; Trotter, 2012). As horses are prey animals whose instinctual reaction to a perceived threat is to flee, the establishment of an effective communication system is critical for the safety of both the horse and the human (Kane, 2007). Traditional therapy animals like dogs and cats may be less cumbersome physically and financially, but as predators, they make more use of reasoning (which could be deadly for a prey animal) and their smaller stature is more easily dismissed by those working with them. It is the reactivity of the horse versus the reasoning of the predator that is the powerful element in teaching the human interacting with the horse to become more aware of their own instincts, emotions, and sensations, the same faculties in themselves that may have eroded from an evolved reliance on analytic thinking (Kane, 2007).

Another qualification that horses possess as teachers of interpersonal skills is their nonverbal communication system. The hallmark of prey animals is an almost exclusive reliance on body language from each other and quiet vigilance of the environment (Kane, 2007). As herd animals, horses “are an inherently co-operative” species whose survival is dependent on sensitivity to their environment, including humans. This fine-tuning to the smallest details of human body and verbal language allows them to sense a human’s emotional state, suggesting they provide immediate and accurate feedback regarding our own behavior (Burgon, 2014, as cited by Sagers & Strachan, 2016, pp. 9–10, and Marchand, 2023). To illustrate, a person may quickly approach a horse to pet it and the horse, being uncertain of the human’s intentions, moves away. The person has the opportunity to think about why the horse moved and adjust their presentation for another attempt. The horse’s attunement to subtle body language, intention, and energy in their environment becomes a type of biofeedback, training us to notice information that we convey while interacting with them (Kane, 2007). This communication dynamic presents opportunities for individuals, through facilitated

translation of feedback from the horse, to reflect on their actions in the moment, develop awareness of how their intentions are perceived by the horse, and draw conclusions about how they may in turn be perceived by other humans, thereby challenging preconceived ideas about relationships and communication (Meola, 2016; Siggers & Strachan, 2016).

EAL and EI

Noting a need for research “that focuses on EAL (as opposed to equine-assisted therapy) and that applies robust theory and a rigorous design appropriate to small, complex samples such as those typical to EAL contexts” (Davis & Stanton, 2023, para. 5), this study examined data from literature featuring EAS in the areas of medicine and organizational leadership. Several health care institutions across the United States have developed and adopted EAL as part of their curriculum for future providers, and current health care professionals are engaging in such programs to help cope with stress and burnout. Proponents note that an emotionally intelligent clinician can improve outcomes for patients, colleague relations, as well as the health care institutions and providers themselves (Dyk et al., 2013; Hamilton, n.d.; Hearts and Horses, 2024; Kane, n.d.).

In the field of organizational leadership, EAL is gaining a strong evidence-base as a promising management training technique. Here, the modality has been associated with corporate employees’ ability to cope with challenging professional situations and form productive relationships among coworkers and managers (Meola, 2016).

The legitimacy of EAL depends on learning transferred from the horse arena to a participant’s personal and professional life, which is maintained over time. The mechanism of action of EAL has been examined by Hemingway and colleagues (2019), who found that skills learned during such interventions caused participants to experience emotional arousal when interacting with the horses, and these somatic states are involved in the cognitive processes of learning.

The generalizability of these skills is further supported by research finding that “employees attending EAL workshops report their experiences translate easily into workplace situations and relationships,” with improvements in self-awareness, self-management, social awareness, and relationship management on the job continuing 6 months after the program (Meola, 2016, p. 297). Millennial workers, a younger workforce that has proved challenging to motivate, reportedly respond especially well to EAL since it gets them out of the office, away from computer screens, and engaging in a sensory experience that is difficult to replicate in traditional training programs.

Research Question/Aim

To examine the possibility that EI is a changeable state among undergraduate students through EAL.

Method

Participants

The study involved 44 undergraduate students from a small, private, liberal arts university in the northeastern United States enrolled in one of two courses. The intervention group consisted of students enrolled in Horses for Interpersonal Skills (HIS) ($N = 18$) and the control group was made up of students enrolled in Introduction to Psychology ($N = 26$). While the HIS course consisted of first- through fourth-year students, the introductory psychology course was comprised largely of first-year students. Other student variables like majors, age, and ethnicity varied randomly. The authors acknowledge that the introductory psychology group received significantly less instruction on EI, and that this course was chosen as a control to determine if EI would remain stable without intervention.

All participants provided their own written informed consent. Participation fulfilled a research requirement for the introductory students.

The HIS Course

HIS was offered twice from September through December in 2015 and 2017 to provide students with an experiential learning opportunity through the application of established equine-assisted activities designed to enhance interpersonal skills. The course was loosely modeled after Stanford University School of Medicine's Medicine and Horsemanship elective (Kane, 2007). Students received on-campus instruction on interpersonal skills accompanied by an off-campus EAL component during which they were

able to apply their knowledge of theories and research to developing the skills necessary for self-awareness and emotional intelligence in everyday life. EAL does not involve riding and consists of established on the ground interactions between students and horses, with professional facilitation, each session targeting a different interpersonal skill. EAL took place at a local therapeutic riding facility where horses had been assessed and approved by certified PATH International instructors in accordance with PATH International guidelines for suitability of equines for educational and therapeutic purposes (PATH International, 2023).

Table 1. Equine-Assisted Learning Activities by Week

Week	Activity	Description (EI objective/interpersonal skill)
1	Introduction	Facility tour, safety demonstration with equine science professional and horse focusing on safely working around the horse; students sign safety contract; question and answer
2	Guided herd observation	4–5 unrestrained horses in pasture; students observe and discuss equine behavior, facilitators point out noteworthy behaviors; students observe first from outside of pasture, then inside with horses and facilitators (Awareness of equine and human nonverbal communication)
3	Choose or be chosen	4–5 unrestrained horses in pasture; pairs or small groups of students each choose horse to interact with or be chosen by horse; interactions may involve observing, talking to, stroking the horse; facilitators guide in-the-moment discussion opportunities about how horse responds to student (Self-awareness, rapport, disclosure, listening)
4	Guest presentation: veterinarian	Veterinarian discusses and illustrates with a horse how rapport and trust of horse and owner are established; shares professional experiences and answers student questions (Trust and social boundaries)
5	Trot out dance	4–5 horses on lead ropes in outdoor arena; students are to trot a horse on a lead in a simple predetermined pattern; facilitators revisit sessions 2 and 3 observations about equine communication as appropriate (Assertiveness, self-confidence, self-esteem)
6	H-O-R-S-E	4–5 horses on or off lead ropes in outdoor arena; students take turns asking the horse to do something (ex: walk 3 steps); similar to the basketball game of HORSE (Self-efficacy, perseverance, intention)
7	The four ways of wisdom	4–5 horses unrestrained in pasture Describe horse's outer characteristics, sensory experience with horse, feelings about the horse, and "ask" horse a question and imagine the answer (Observation, perspective taking, empathy)

(continued)

Table 1. (Continued)

Week	Activity	Description (EI objective/interpersonal skill)
8	Handicaps	4–5 horses unrestrained in pasture Accomplish task with horse and group with randomly chosen “disability” from facilitators (ex: inability to speak) (Empathy, relationship management, vulnerability)
9	Extended appendages	3 horses on cross ties in barn aisle 4 students are connected to each other in some way (ex: holding hands) and asked to accomplish assigned task (groom, clean feet) with horse; the two middle position students are the “brain” and can only think and give orders while students on ends can use only one arm and are nonverbal (Communication, teamwork, cooperation, frustration tolerance)
10	Circular relations	4–5 horses unrestrained in outdoor arena or pasture 2 groups of students are privately asked to accomplish assigned conflicting tasks with the horse without speaking to each other (ex: one group is told to get horse to go clockwise around arena or pasture over a specific jump while the other group is told to do the same task with a different jump and counterclockwise) (Leadership, conflict management, collaboration)

Kane (2007); EAGALA (2006). All sessions were 80 minutes in length and ended with a 20-minute “debriefing” discussion where facilitators utilized questions from Kane (2007) and EAGALA (2006) programs.

EI Measure

Due to overlapping views of EI as a permanent trait, temporary state, or mixed quality, there is disagreement as to which type of assessment is better, with no consensus on how to best capture EI as an evolving trait. One measurement style captures EI through personality tests, viewing it as an enduring and stagnant trait, while a second style is a measure of ability or more temporary state (Furnham, 2012). The third theoretical perspective considers EI a mix of ability and traits (O'Connor et al., 2019). The current study's aim was to measure emotional self-efficacy, viewing EI as trait that can be enhanced over time. As such, the Trait Emotional Intelligence Questionnaire, Short Form (TEIQue-SF) was utilized, as recommended by O'Connor et al. (2019).

The TEIQue-SF possesses strong psychometric properties, is freely available, user friendly, and is directly modeled on the facets shared between trait and ability EI (Perez et al., 2005). The 30 items of the self-report inventory are taken in pairs from each of the 15 facets of the full form and examine

adaptability, assertiveness, emotional perception, emotional expression, emotional regulation, impulsiveness, relationships (that is, “starting and maintaining emotional bonds with others”), self-esteem, self-motivation, social awareness, stress management, trait empathy, trait happiness, and trait optimism (Petrides, 2009, p. 60). Items are based on a 7-point Likert-type scale, ranging from 1 (disagree completely) to 7 (agree completely). Global trait EI scores were chosen rather than subscale scores because the researchers were interested in obtaining a measure of general emotional functioning that could be more easily compared with other articles utilizing global measures. Higher scores indicate higher levels of emotional intelligence. In this study, the scale ranged from 30 to 210, with participants scoring between 112 and 206. The Cronbach's Alpha score for the TEIQue-SF scale is .847. The questionnaire was distributed to all participants during the first week of class to obtain the pretest assessment and the final week of class to obtain the posttest assessment. Characteristics of the sample are summarized in Table 2.

Table 2. Demographic Characteristics

	Full Sample (n = 44)	Experimental (n = 18)	Control (n = 26)
Gender			
Male	10	2	8
Female	34	16	18
Age** (18–46)			
Mean	20.66	23.72	18.54
Year in School***			
Freshman	17	0	17
Sophomore	9	1	8
Junior	6	5	1
Senior	12	12	0
Major			
Nursing	16	4	12
Exercise Science	4	0	4
Pre-Med/Biology	6	4	2
Physician Assistant	4	1	3
Occupational Therapy	6	1	2
Psychology	5	5	0
Other	6	3	3
HS GPA (3.0–4.0)			
Mean	3.68	3.69	3.68
Emotional Intelligence			
Mean at Time 1	146.68	154.83	157.96
Mean at Time 2	160.14	162.61	158.42

** Statistically different

Design

A quasi-experimental design was utilized with samples of students who chose to enroll in one of the two courses. The independent variable was course type, and the dependent variable was global EI score on the TEIQue-SF. The intervention group consisted of students enrolled in HIS while the control group consisted of introductory psychology students.

Procedure and Materials

The study was approved by the university's Internal Review Board. The intervention group engaged in a series of 10 different weekly off-campus EAL exercises over 15 weeks as denoted in Table 1 and attended 10 on campus classroom lectures focusing on interpersonal skills. Five weeks were utilized for assessment purposes. EAL exercises addressed the

interpersonal skills discussed in the lectures and provided participants the opportunity to examine their self-identified interpersonal challenges utilizing emotional intelligence competencies.

The control group received an equal amount of traditional classroom instruction on introductory psychology with significantly less information on EI to determine if no intervention would result in stable EI scores.

Both group's lectures lasted 80 minutes and were taught by a university adjunct instructor who is a licensed psychologist, trained by the Equine Assisted Growth and Learning Association (EAGALA, 2006, 2018), PATH International, and has a three-decade history of combined professional and recreational equine experience. EAL exercises were 80 minutes in length and facilitated by the instructor and an equine specialist holding a bachelor's degree in equine science, EAGALA training, and two decades of combined professional and recreational equine experience. Data was collected during the first (pretest) and last (posttest) weeks of the fall semester.

Analysis

The current study utilized a pretest-posttest control group design. The outcome, in this case global emotional intelligence (EI), was measured at the beginning of the course to obtain a baseline EI score and was measured again at the end of the course for both the intervention and control groups to examine change. Global EI scores were collected because the researchers were interested in overall EI as an indicator of life success. The sample consisted of two groups across two semesters as outlined in the methods section. The intervention group was preassigned, based on their enrollment in the Horses for Interpersonal Skills course. The control group consisted of volunteers from an Introduction to Psychology course.

Independent sample *t*-tests were initially utilized to examine the differences in pretest, posttest, and overall change scores in total emotional intelligence among the sample. These results can be found in

Table 3. An analysis of covariance (ANCOVA) was then conducted to examine changes in EI scores for the intervention and control groups at two separate time points. The one-way ANCOVA was utilized to determine if there were significant differences between the intervention and control group on the dependent variable. In the ANCOVA model, the difference score between the pretest and posttest served as the outcome and the pretest was the covariate. This was done to analyze change over time, rather comparing group differences at time 2, while controlling for time 1 scores.

Results

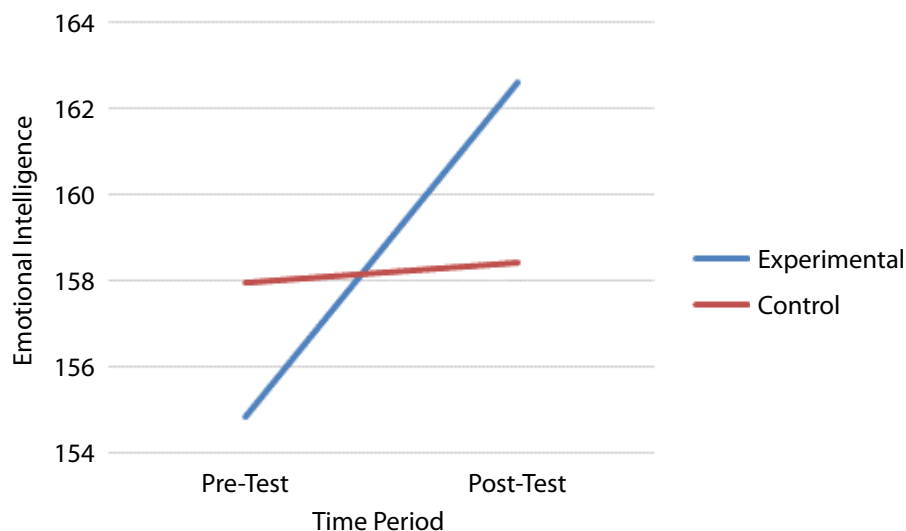
The study consisted of 47 individuals, three of whom were removed from final analyses due to not completing the posttest survey, resulting in a sample of 44. Twenty-six students were in the control group and 18 were in the intervention group.

Demographic characteristics and averages scores of EI for the total sample, intervention, and control groups are shown in Table 2. In total, there were 34 females and 10 males in the study, with 16 females and 2 males involved in the experiential learning course. The intervention group was significantly older (23.72 vs. 18.54) and more likely to be upperclassmen compared to subjects in the control group. There were no other statistically significant differences between the two groups. Subjects in both groups were primarily health science majors, which is consistent with the university's student population. Table 3 outlines trait emotional intelligence group statistics by showcasing the overall averages for both the intervention and control group during the pretest, posttest, and total change, based on results from independent sample *t*-test analyses. While the analyses for each pairing (pretest, posttest, overall difference) were not statistically significant, results indicate overall differences between the two groups. At time 1, the intervention group (mean = 154.83) had overall lower levels of emotional intelligence compared to the control group (mean = 157.96). When emotional intelligence was measured again at time 2, the results were flipped.

Table 3. Trait Emotional Intelligence Group Statistics

	Treatment	Control	T-Value	95% C.I of Difference	
				Lower	Upper
Pretest	154.83	157.96	0.502	-15.69	9.44
Standard Deviation	16.24	22.65			
Posttest	162.61	158.42	0.629	-9.25	17.63
Standard Deviation	29.97	22.22			
Total Change	7.78	0.46	1.295	-4.09	18.72
Standard Deviation	22.35	15.19			

Results based on independent sample T-tests.

**Figure 1.** Change in estimated marginal means of emotional intelligence.

The intervention group exhibited higher levels of emotional intelligence (mean = 162.61) compared to the control group (mean = 158.42).

As Table 4 indicates, the intervention group exhibited an increase of 7.78 points in emotional intelligence compared to the control group, which showed an increase in EI of less than half a point (.46). Figure 1 further illustrates the change in emotional intelligence from time 1 to time 2 among the intervention and control groups. While the overall change between the pre- and posttests were not significant between the intervention and control groups, the confidence intervals (-4.09 and 18.72)

suggest that there is a 95% chance that the indicated range includes the population difference in mean emotional intelligence.

ANCOVA analyses were also conducted to examine the group differences in emotional intelligence by looking at total change in scores, while controlling for scores in time 1. As shown in Table 4, there continues to be no statistically significant difference between the intervention and control group when analyzing emotional intelligence changes over time. Additional analyses were conducted to examine if the change in emotional intelligence was a result of age differences rather than group differences;

Table 4. ANCOVA Results for Changes in Emotional Intelligence by Group and Pretest Scores

	Observed Mean	Adjusted Mean	SE	95% CI	
				Lower	Upper
Treatment Group	7.78	7.15	4.08	-1.10	15.40
Control Group	0.46	0.896	3.40	-5.96	7.76
Source of Variable	Sum of Squares	DF	MS	F	Sig.
Pretest E.I.	1994.16	1	1281.75	6.67	0.013
Variance Between Groups	413.62	1	2277.84	1.38	0.246
Error	12265.41	41	299.16		

Note: $R^2 = .173$; Adj. $R^2 = .133$

however, there was no significant effect of age on EI change (results not shown).

Discussion and Future Implications

The current study examined the efficacy of a 15-week interpersonal skills course (with a 10-session EAL component) on trait EI in undergraduate students assessed through pre- and post-intervention scores on a standardized measure of trait EI.

Results of this study were not significant; however, the intervention group, which had lower overall levels of EI at time 1, exhibited higher levels of EI at time 2 compared to the control group. EI scores among the no intervention control group remained relatively stable. While these early results appear encouraging, the authors recognize limitations that may influence the study’s generalizability and replicability. Stronger methodology in future studies considering the following variables, which are expounded upon below, will help to more definitively determine if and which type of intervention matters:

Methodology and Protocol

- Sample size, selection, and variables
- Measure
- Program and session length and curriculum
- Long-term follow-up
- Facilitator credentials and experience

- Number and training of horses (therapy vs. nontherapy)
- Awareness and adoption of best practices for equine well-being (Fine, 2011)

Sample Size, Sampling, and Variables

The small N poses a limitation to concluding with any statistical accuracy that EI is malleable due to EAL. Of specific note is that compared to the control group, students who chose to take the HIS course may have done so due to their baseline lower levels of interpersonal skills, thereby posing a threat to external validity. Demographic differences including the larger number of upperclassmen and females in the intervention group and inherent differences in students who choose experiential programs (Davis & Leslie, 2015) may also have limited generalizability. To address the small N of this and many studies in this field, the obvious solution is to employ a larger sample size; however, EAL is designed for small groups for the safety of both humans and equines as well as maximum benefit for participants. While this issue could be minimized by offering several small group courses and collecting data over time, such studies would be subject to the limitations of longitudinal data. Additionally, a more comparable control sample could be employed in future generations of this course by adding an on-campus version with the same EI curriculum as the

EAL course minus the EAL component. This study showed no significant effect of age on EI change and no statistically significant difference between the intervention and control groups when analyzing emotional intelligence changes over time. Closer examination of these variables as well as participant gender and discipline of study should be considered with a larger, more randomly selected sample in future research.

Measure

A review of the literature calls attention to the challenges of conceptualizing and assessing emotional intelligence. The creator of the TEIQue-SF regards EI largely as a trait, rather than a changeable state; therefore, the results attributed to EAL could be temporary (Petrides, 2009). Utilization of additional tools that consider EI a malleable state and specific measures of empathy and self-awareness could fortify future findings.

Program and Session Length and Curriculum

The number and length of sessions in this study were similar to programs utilized at other institutions (Hamilton, n.d.; Kane, n.d.). Attempts to collect longitudinal data were unsuccessful due to student breaks and graduation. There is, however, evidence in the research noting that changes in EI experienced by EAL and traditional SEL program participants can persist for 6 months, suggesting that EI can be improved with lasting results (MacCann et al., 2020; Meola, 2016). In addition to bolstering the rigor of research, a larger sample size might also improve the successful collection of longitudinal data to assess long-term effects. Course curriculum variations due to the convenience sample may have significantly affected the outcome of this study. More standardized content as well as frequency and duration of sessions across intervention and control groups would help clarify the specific role of the horse in the development of interpersonal skills (Fine & Andersen, 2021).

Facilitators

Multiple national and international organizations provide training standards and structure for provision of EAL, and the field would benefit from a collaborative venture in training equine-assisted service providers.

Equine Co-Facilitators

This discussion would be incomplete without considering the characteristics and well-being of the horses since they comprise a critical portion of the independent variable. The current study involved professionally assessed, experienced therapy horses. Some EAL programs include untrained horses, believing participants are “able to learn relationship principles in their most pure form with a horse who is virtually a ‘blank slate’ when it comes to relating with humans” (Natural Lifemanship, 2017, para. 3). While working with horses that have been screened and chosen for their even temperament has safety benefits, it is possible that the lower reactivity of these horses influenced the feedback the students received from them, possibly affecting results.

On a related note, future researchers should be aware of a concerning lack of reference to risk assessment for both human and animal participants in animal-assisted interventions (AAIs) (Fine et al., 2019; Lopez-Cepero, 2020). For example, a risk of engaging in physical contact with animals is the transmission of *zoonotic disease*, “an infectious disease that is transmitted between species from animals to humans or from humans to animals” (Fine et al., 2019; Minnesota Department of Health, 2019, n.p.). Additionally, horses are very susceptible to environmental stressors such as physical constraints, controlled resources (type of feed, feeding schedules, and time outside in adequate space with other horses), and situations requiring inhibition of their natural instincts and emotions (De Santis et al., 2017). As prey animals, it would make sense that almost all horses would provide similar feedback to those interacting with them; however, this feedback could differ depending on the horses’ physical and emotional

states. If so, and if the horses' living conditions do in fact influence their physical and emotional states, this poses a limitation that will be difficult to overcome since it would be nearly impossible to replicate equine living conditions from study to study. An important note that is beyond the scope of this study but deserving of mention and future attention is that in the author's experience, great variation exists in awareness of and attention given to horses' psychosocial needs. There is, however, a reassuring trend toward increasing societal awareness of such needs, and Fine and Mackintosh (in Fine et al., 2019, section 4.4) "stress our moral responsibility to listen to therapy animals' silent communications and make decisions that are in their best interest, placing animal welfare at a comparable level to [client] outcomes." Thinking in terms of partnering with horses vs. using them as a tool and enhancing the training of practitioners to help them more accurately interpret equine behavior within the horse-human interaction would benefit the equitation community at large and promote greater horse psychological welfare (Kieson & Abramson, 2016). In the author's experience, horses who are biopsychosocially sound provide a safe, genuine, and humane learning environment in which authentic feedback is received by participants and wellness is more likely to be experienced by the horses.

Widening the scope of this idea is the knowledge that the well-being of both humans and animals is dependent on a healthy ecosystem. Therefore, "continued investigation of the theoretical basis for the benefits of animals and nature in general" when conducting AAIs must be highlighted for ethical reasons as well as for the increasing awareness of and interest in animal wellness and emotion (Bekoff, 2000; Brelford et al., 2017; Fine et al., 2019, sections 4 & 4.1).

Educational Considerations

Despite the challenges of implementing experiential courses in traditional academic environments, recent changes stressing the importance of noncognitive qualities are occurring. Such changes include greater use of group activities in current assessment

and learning practice, a focus on social-emotional skills by universities as graduate attributes, and the greater emotional skills required to build classroom relationships with instructors and other students in an increasingly online environment (MacCann et al., 2020; Wurdinger & Allison, 2017). These points are amplified by academic and social-emotional declines due, in part to the increased screen time and social isolation experienced by students during the pandemic (Arizona State University Mary Lou Fulton Teacher's College, 2023; National Center for Education Statistics, 2023).

If EI is in fact malleable and related to effective social and occupational functioning and if students do learn best through experience, universities should consider assessment and contribution to the increased development of EI among their students through undergraduate course offerings. The results of such endeavors may positively influence student's academic, personal, and professional experiences as well as improve enrollment and graduation rates for the university (Kolb & Kolb, 2005; Nelis et al., 2009).

Implications for Practice

EAL is an experiential learning approach deserving of consideration as a unique and memorable experience for participants looking to enhance EI abilities. Despite the potential efficacy of EAL for teaching interpersonal skills, the notion that its impact on human well-being may have been exaggerated by anecdotal evidence, bias to publish positive findings, and media sensationalism cannot be ignored (Fine & Andersen, 2021). Practitioners in EAL and animal-assisted services in general are encouraged to standardize program structure including terminology, ideal number of group participants, length of sessions and program, facilitator credentials and quality of interaction with participants, course curriculum, and selection and care of animal co-facilitators. Systematized programming in research will allow for stronger data with which to better equip institutions and instructors wishing to offer this type of course for students or clients in the future.

Conclusion

Keeping limitations in mind, EAL remains a unique, attractive, and potentially effective learning modality available to future educators and researchers who are motivated to study social and emotional outcomes through well-designed studies and commit to producing results that uphold robust outcomes (Anestis et al., 2014). The HIS course may provide a springboard for programs and studies with larger and more diverse populations of students using a more rigorous longitudinal design.

The outlook for such endeavors is complicated by the historically disproportionate amount of anecdotal evidence in the animal-assisted interventions field overall, including EAL. Such data may introduce a cognitive bias, making results ungeneralizable and difficult to replicate, adding to the need for a larger and more robust evidence base driven by thorough and strict protocols with improved design and control conditions (Brelsford et al., 2017; Holmes et al., 2011). Considering these limitations, the observed treatment effects of EAL on undergraduate students' EI should be considered with cautious optimism. The results may represent a valuable early finding that complements research noting that EI, arguably the most important factor in academic, career, and overall life success, is diminishing in society but can be taught through experiential programming involving horses (Konrath et al., 2011; Meola, 2016; Nelson & Low, 2010).

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Note

1. AUTHOR PLEASE PROVIDE MISSING NOTE.

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