Innovation Grant Application Form

Before completing the following application, carefully review the 'Guidelines and Information' and 'Application Checklist' documents at www.horsesandhumans.org.

A complete application packet includes:

I. Cover Page
II. Scientific Abstract
III. Need/Justification
IV. Research Narrative
V. Proposed Time Line
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VIII. Lay-language Abstract
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X. Evidence of Compliance with Government Requirements
XI. Signed 'Conditions of Award' Form
XII. Attachments

Please no binding or stapling of materials. Incomplete applications will not be considered. Applications lacking any of the required materials are considered incomplete.

Applicants are required to use correct equine-assisted activities/therapies (EAA/T) terminology (available at horsesandhumans.org).

APPLICATIONS MUST BE SUBMITTED IN BOTH PAPER AND ELECTRONIC FORMATS. Email the completed application to info@horsesandhumans.org. The subject line of ALL emails should be the complete title of the application. Multiple attachments or emails *will* be accepted. Additionally, submit a paper version of the completed application (one complete set of all required paper work, with original signatures) to:

USPS (regular U.S. mail):
Horses & Humans Research Foundation
P.O. Box 480
Chagrin Falls, OH 44022 USA

UPS/FEDEX:
Horses & Humans Research Foundation
16 Daisy Lane
Chagrin Falls, OH 44022 USA

Horses and Humans Research Foundation (HHRF) must receive the completed application by the end of the business day on the established deadline (Should the deadline fall on a weekend or holiday, the due date is the closest **preceding** business day). The main contact listed on the application will be sent a notice (by email or mail) of receipt of their application within two weeks of the HHRF office receiving it. If the applicant does not receive such a confirmation, inquire at info@horsesandhumans.org.

HHRF Research Grant Application Cover Page

Title of Project: Can horses distinguish between neurotypical and mentally traumatized humans?

Submission Date: August 17, 2015

Principal Investigator Name and Title: Dr Katrina Merkies

Contact Name and Title: Dr Katrina Merkies, Associate Professor

(NOTE: The contact person is the only person with whom HHRF will have direct contact. The contact person receives all letters and notification from the HHRF office.)

Institute: University of Guelph

Address (provide physical AND mailing addresses, if different): Department of Animal and Poultry Science

50 Stone Rd East

Guelph, Ontario, Canada. N1E 2W1

Telephone Number: 519 824-4120 x54707

FAX Number: 519 836-9873

Email Address: kmerkies@uoguelph.ca

URL: http://www.aps.uoguelph.ca/users/kmerkies

Primary focus area of the investigation (i.e. mental health, physical therapy, speech therapy, occupational therapy, education, recreation, the horse-human relationship): horse-human relationship

Years and Titles of past HHRF Funding Applications: (none funded to date)

2014 – Optimal pairing of horse and human for maximal benefit in equine-assisted programs

2013 – Optimal pairing of horse and human for maximal benefit in equine-assisted programs

2011 – Investigation into the effects of human behaviour and physiological state on stress reactions in horses.

Safety and quality standards for EAA/T:

Name(s) of personnel directly involved with any associated EAA/T:

Nikki Duffield – Program Director & Head Instructor Sunrise Therapeutic Riding and Learning Centre http://www.sunrise-therapeutic.ca/index.html

Are all listed personnel certified to provide the activities? Yes No (If yes, please provide member numbers with each name)

Certifying organization's name, website and contact information, or evidence of equivalent standards adhered to (please attach explanation if necessary):

Nikki Duffield – ECI CTRI Canadian Therapeutic Riding Instructor http://cantra.ca/

CanTRA Head Office, 5420 Hwy. 6 N, R.R. #5, Guelph, Ontario, N1H 6J2. ctra@golden.net (519) 767-0700

Site standards for EAA/T:

Is the site providing EAA/T programming accredited to do so? Yes No Member Number:

Accrediting organization's name, website address and contact information, or evidence of equivalent standards adhered to (please attach explanation if necessary):

Sunrise Therapeutic Riding and Learning Centre – CanTRA certified

Will others collaborate or consult with you on this project

Yes No

If yes, list Individuals or Organizations collaborating on project:

Nikki Duffield, ECI CTRI, Program Director & Head Instructor at Sunrise Therapeutic Riding and Learning Centre (STRLC)

Please note the change in collaborators. Since the Principle Investigator (KM) has been relocated to a different campus of the University of Guelph, collaborators in the new local area have been approached. KM appreciates the support that Glenna Hunter, Ryan Theriault and Tranquil Acres have provided in the past, and is thrilled with the enthusiasm and excitement that STRLC has exhibited in relation to this and other research and education projects.

Collaboration will also proceed with a local mental health professional/psychotherapist. However with the recent relocation, there has been insufficient time to confirm this individual. Once this relationship is established, HHF will be informed.

Attach letters to you that state collaborating individuals or organizations agreement to do so.

See attached letter of support from STRLC

Brief description of project (60 words or less):

This research project will determine if horses can distinguish between neurotypical humans and those with mental disabilities and respond differently behaviourally and physiologically even though exposed to the same external human behaviours (i.e. the horse would respond to the emotional energy rather than purely the physical behaviours).

Pilot Study Completed? Yes No Completion Date:

Planned start date of project: January 1, 2016

End date of project: December 30, 2016

Amount Requested from HHRF: $9070.00

II. Scientific Abstract - 200 words or less, double spaced, describing the proposed project. .

Please emphasize the innovation aspect of your project.

Equine-assisted activities (EAA) rely on appropriate pairing of a horse with a human participant to extract applicable learning opportunities that enable the participant to benefit fully from the interaction with the horse. Facilitators need not only to know the temperament of the horses at their disposal, but also to understand how certain human personalities or actions affect the behaviour of certain horses. Some criticisms of research studies in this area target the (unproven) assumption that horses will respond differently to humans with psychological/emotional issues (eg. PTSD) than to humans not experiencing any psychological trauma – the implicit belief that the horse "intuits" the needs of the emotionally-challenged human and responds benevolently. As a foundational pilot study to expand research of behavioural responses of horses in equine-assisted settings, the working hypothesis of this project is that horses will respond differently to humans with clinically-diagnosed psychological conditions than to neurotypical humans. Horse behaviours (gait, head height, body orientation, ear orientation, distance to human) and horse heart rate and salivary cortisol will be compared during interaction with each type of human. Understanding the horse's role in the processes involved in equine-assisted therapy is essential for furthering research into animal-assisted therapies not only from the human perspective, but from the lens of horse welfare to minimize stressful experiences for the horse and ensure participant safety.

Sections III-VI below should total 8 pages or less (excluding references, bibliography, charts and graphs, which should be included as Attachments in Section XII) typed on one side of the page only, with pages numbered, double spaced, 1" margins and 12 point font size.

III. Need/Justification Why is the proposed project useful to the EAA/T industry? What need is there within the current information and treatment modalities in use? What are the anticipated implications for EAA/T and/or the disorder being studied? It may be helpful to include links with prior work in EAA/T, basic information about the disorder being studied, current 'best practice' treatment, comparative studies and/or possible translation into 'evidence based practice'**. Please fully articulate the innovation aspect of your project.**

Research in the field of equine-assisted activities (EAA) is gaining momentum. The effects of EAA on humans has and continues to be well-documented and investigated, however the effects of EAA on the horses themselves has received little attention. To date, only three published articles are available in the literature addressing this aspect (Gehrke et al. 2011; Fazio et al. 2013; Merkies et al. 2014). Combined with increased public attention to the welfare of animals used for human purposes, clearly there is a need for research in this area. However, for useful research to proceed, some basic questions need to be answered to be able to conduct future trials that can withstand peer-review and provide unbiased empirical data on which to fashion EAA.

The scientific method relies on using appropriate methodologies that successfully limit or eliminate testing bias or confounding. The use of control subjects minimizes the effects of other dependent variables and increases the reliability of the results. However, when conducting research on individuals (horses or humans), it is difficult to control all aspects. There is an acceptance from people who work with horses that the horses themselves appear to respond to emotional emanations from the humans they interact with. A few scientific studies have supported this approach (Keeling et al 2009; Merkies et al. 2014). However, proponents of learning theory believe that animals respond to the physical cues they receive independent of who/what delivers the cues. For example, a horse worked in a round pen will respond with the characteristic submissive behaviours of head-lowering and licking and chewing equally to a remote-controlled car as to a human trainer (Henshall et

al. 2012). If indeed horses are responding to physical cues, then independent human control subjects can be used when researching horses' responses to EAA. However, if horses do in fact respond to emotional emanations, then research in the field of EAA needs to proceed with this understanding and look further into the emotional relationship or connection between the horse and the human. The understanding that horses respond to human emotions when working with people with psychological or emotional trauma has not yet been tested in a scientific manner. This research will further this basic understanding which will underpin all future research not only into EAA, but also into the horse-human and animal-human relationships. Thus, this novel research proposal will provide a cornerstone for continued exploration in these areas.

IV. Research Narrative

Narrative should be clear and concise and may include but is not limited to:

Introduction:

Over the past few decades, there has been a growing interest in equine-assisted activities (EAA) and equine-assisted therapy (EAT) as the benefits of interacting with horses become apparent (Frewin and Gardiner 2005). Programs continue to be developed to assist human participants in such areas as overcoming emotional trauma, improving self-esteem, or dealing with developmental or mental disabilities (Klontz et al. 2007). The basic premise of these programs is that the immediate and direct feedback from the horse allows the participant to explore his/her own self. This requires an understanding of horse behavior on the part of the facilitators to foster a positive learning environment.

EAT programs begin by introducing the human participant to the horse he/she will interact with. The appropriate pairing of a horse with a participant is essential in developing suitable learning and discovery opportunities for each individual participant. One presupposition of this therapy is that the horse can intuit what support the human

participant requires and thus the human is paired with a horse that can fulfill these needs. While it is impossible to ascertain the degree to which horses sense and respond to meet the needs of human participants, it is reasonable to suspect that a number of variables influence a horse's response to his human partner. It is known, for example, that both the temperament of the horse and the attitude of the human (Hausberger et al. 2008) play a role in the horse-human relationship. Programs utilizing EAT invariably encounter humans with physical and emotional emanations, as the focus of the exercises is to allow the participants to recognize and face their bodily limitations or fears. Both physical and emotional cues may play a large role in how horses perceive and respond to humans. For example, heart rate increased in horses that were petted by humans who were thinking negative thoughts (Hama et al. 1996); horses being led through a maze by a handler with a negative attitude were less cooperative (Chamove et al. 2002); more highly-strung horses were less cooperative with riders exhibiting a higher degree of internal control (Visser et al. 2008); humans that were anticipating the occurrence of a frightening incidence while leading or riding a horse caused an increase in both their own and the horse's heart rate (Keeling et al. 2009); while humans that were nervous around horses caused a decreased heart rate in the horses themselves (Merkies et al. 2014).

The importance of fully understanding the variables that affect this relationship is essential considering that the most significant factor contributing to the risk of human injury when working around horses is the relationship between the horse and the human (Keeling et al. 1999; Hawson et al. 2010).

Literature abounds with the effects of stress placed on individuals working in the world of social work, psychology and psychiatry (reviewed in Lloyd et al. 2002). It is reasonable to assume that animals placed in similar environments would also experience stress,

particularly when working with humans experiencing traumatic mental and emotional issues. How horses deal with constant or even intermittent exposure to humans who display erratic behavior, scream or yell, exhibit sudden movements, or unconsciously evoke predatory behavior has received little attention. A study interviewing human volunteers involved with animal-assisted therapy concluded that more attention needs to be accorded to the benefits the animals receive in these programs (Hatch 2007). To date, only three studies evaluating the effect of humans on horses involved in EAT have been published. Gehrke and colleagues (2011) found no difference in resting heart rate variability in horses used for EAT versus thoroughbred horses. However, the data for these groups of horses came from two different studies, and the horses were not actively engaged in EAT sessions. A more sophisticated study found lower concentrations of circulating stress hormones in horses engaged in riding sessions with disabled riders than with recreational riders (Fazio et al. 2013). Complementing this, Merkies et al. (2014) reported less stress-related behaviours in horses exposed to psychologically-stressed humans (i.e. fearful) than physically-stressed or calm humans.

Developed societies are placing increased emphasis on the welfare of animals used for human purposes. This should not overlook non-production animals, and in fact, increased attention should be paid to animals involved in human pleasure, learning or recreational pursuits as their welfare states may be affected for longer periods of time than animals intended for human consumption. Improved understanding of how therapy horses interact with and respond to humans will pioneer further research into appropriate and responsible methods for use in equine-assisted therapy.

Hypothesis:

The working hypothesis is that horses will distinguish between neurotypical humans and humans experiencing psychological trauma as evidenced by different behaviours and physiological parameters (heart rate and salivary cortisol).

Materials and methods:

An Animal Utilization Protocol (AUP) has been approved by the University of Guelph Animal Care Services under the auspices of the Canadian Council of Animal Care prior to experimental procedures (3344). A similar protocol has been reviewed by the Research Ethics Board (REB) at the University of Guelph for approval of human research subjects (13MY036).

Twenty horses will each be exposed to 4 neurotypical humans [control group] and 4 humans diagnosed with a psychological illness [treatment group] (80 trials/group x 2 groups = 160 trials, which meets the a-priori sample size determined using Cohen's d anticipated size effect of 0.05 and a power level of 0.80 www.danielsoper.com). The four adult treatment humans will be recruited for this study in consultation with their psychotherapist, and will display behavioural repertoires associated with post-traumatic stress disorder (e.g. yelling, impatience, disinterest). The four neurotypical human volunteer actors will be matched for age, size and gender. All horses are trained for equine-assisted psychotherapy programs, but all test humans will be unfamiliar to the horse. All aspects of safety around horses will be reviewed with each participant beforehand, and all testing will occur in the presence of trained horse handlers who can intervene if the situation warrants. A salivary sample will be obtained from each horse 30 minutes prior to testing for determination of resting cortisol concentrations. Horses and humans will be independently outfitted with a heart rate (HR) monitor (Polar RS800) 10 minutes prior to

each test for recording of heart rate every second for the duration of each test. A video camera will be mounted above the test location to record all tests. Horses will be introduced individually into a familiar enclosed environment (round pen 20m in diameter) by an unassociated handler. Horses will be wearing a halter, but will be free to move about the round pen as they choose. Baseline data will be collected for 5 minutes, after which the treatment human will be tested first in each instance by entering the pen individually with the horse and moving about the pen as he/she chooses, but instructed not to initiate physical interaction with the horse. If the horse makes physical contact, the human can ignore the horse or move away as he/she chooses, but not pet or stroke the horse. Each test will last for 2 minutes. The paired control humans will view the video recordings of the treatment humans to re-enact the same behaviours for the same duration. This re-enactment may not result in mirror scenes as the horse is not expected to perform exactly the same movements, but the human actor will move about the pen in the same fashion as his/her paired treatment human, and react to initiated horse contact in the same manner. A subsequent salivary sample will be obtained from each horse 30 minutes after testing to examine for the presence of a spike in cortisol indicating stress during testing. Retrospective observation of the video recordings by scorers blind to the treatments will note horse behaviours every second (gait, head height in relation to the withers, ear and body orientation), distance from the human (in meters), and any physical contact initiated with the human.

The effect of treatment on the horse's behavioural and physiological responses will be determined by analyzing horse heart rate, salivary cortisol and behaviour data using a General Linear Mixed Model with repeated measures and considering horse as a random factor. An independent t-test will determine differences in behaviours and heart rates between treatment groups.

V. Proposed Time Line

Milestones	Date of completion
Selection of humans (4) with mental disabilities in consultation with psychotherapist	February 2016
Recruitment of human volunteers (4) matched in age, size and gender with the four treatment humans	April 2016
Data collection for the four treatment humans	May 2016
Review of videos of treatment sessions by control humans and acting coaching to re-enact similar physical behaviours	June 2016
Data collection for the four control humans	July 2016
Data analysis	September 2016
Manuscript submission to peer-reviewed journal (eg. Journal of Applied Psychology)	December 2016

Note: results will also be presented at relevant scientific conferences (eg. International Society of Equitation Science (August 2017); PATH International Conference (November, 2016); EAGALA Annual Conference (end of March, 2017)

VI. Intent to Publish

Recipients of HHRF grants will be committed to a serious effort to publish resulting research findings in a peer-reviewed journal. Please detail your intentions for further disseminating research results, including plans to publish and present.

A manuscript will be prepared and submitted to a peer-reviewed scientific journal appropriate for the content.

- The Journal of Applied Psychology is the top journal in the field of applied psychology as ranked by SCImago
- Journal of Veterinary Behaviour Clinical Applications and Research, another top-ranked journal, will reach readers from the equine research perspective

VII. Budget

All budget items must be related directly to the research question and methodology and will be prorated. Larger grants may be paid in progressive payments, checks written only after progress reports are sufficiently completed. All budget referrals should be related in U.S. dollars. **Please provide itemized budget <u>and</u> narrative justification. No indirect costs are allowed.** There are no word limits to this section, however, please be concise in explanation.

TOTAL GRANT REQUEST (US Funds): $9,070

1) **PERSONNEL:** *(Principal investigator, co-investigator, statistician, research assistant)* Please describe scope of work, salary, fringe benefits, FTE.

   Sunrise Therapeutic Learning and Riding Centre (STLRC) staff (two staff required to be present during testing per farm policy): 30 hours @ $20 x 2 = $1200

   Research assistant: 60 hours @ $20 = $1200

   Statistician: 4 hours @ $120 = $480

   Personnel Total: $2880

   Personnel % of total budget: 32%

2) **PERMANENT EQUIPMENT:** Itemize and describe purpose, justification of needs, how it will be acquired, etc.

   Permanent Equipment Total: $0

   Permanent Equipment % of total budget: 0

3) **CONSUMABLE SUPPLIES:** Itemize and describe justification of needs, how it will be acquired, etc.

   Spectra gel for heart rate monitors: 2 tubes @ $15 = $30

   Batteries for heart rate monitors: $50

   Salivette tubes for saliva sampling: $150/box 100 x 4 = $600

   Salivary cortisol analyses: 320 samples @ $5 = $1600

   Stationary/printing/office supplies: $50

   Consumable Supplies Total: $2330

   Consumable Supplies % of total budget: 26%

4) **CONSULTANT COSTS**: Describe rate of pay, scope of work, justification of need, etc.

   Psychotherapist – required to assist in recruiting and recommendation of treatment humans:

   4 hours @ $200 = $800

   Acting coach – to provide instruction to control humans in acting out treatment human behaviours: 4 hours @ $50 = $200

   Consultant Costs Total: $1000

   Consultant Costs % of total budget: 11%

5) **TRAVEL**: *(Will only cover subject travel reimbursement or for meeting of work groups.*)

Travel to STLRC for subjects: average 50km roundtrip @ $0.43/km x 32 trips (4 trips/subject) = $688

Workgroup meeting – prior to start of research trials; psychotherapist, EAT staff, acting coach, research team: 50km roundtrip @ $.43/km x 8 = $172

Travel Costs Total: $860

Travel % of total Budget: 9%

6) **CLIENT-RELATED EXPENSES**: Itemize and describe all related costs.

Honorarium paid to all human participants: 8 participants @ $100 (will require 30 minutes of their time on four separate testing occasions plus training and travel time)

Client-Related Expenses Total: $800

Client-Related Expenses % of total budget: 9%

7) **HORSE EXPENSE:** *(Must be directly related to research question and methodology.)* Explain cost basis related to percentage of time used in project.

20 horses @ $60/horse = $1200. Each horse will be employed for 8 tests of 10 minutes (total time of 3 hours including preparation and removal of equipment and salivary cortisol testing time)

Horse Expense Total: $1200

Horse Expenses % of total budget: 13%

8) **BUDGET JUSTIFICATION:** Please provide any further budget justification or explanation here.

OTHER INCOME SOURCES and ANTICIPATED FUNDING SUPPORT:

a. Active/Committed: Is this project being funded by other sources (federal, institutional and/or private grants or other sources)? Please provide source/institution name, project titles, specified designations and restrictions, starting and ending dates and amounts. Do not include general or overall program support.

Total Active/Committed: $NA

b. Pending: Is support for this project being sought elsewhere? Please provide source/institution name, project titles, specified designations and restrictions, starting and ending dates and amounts.

Total Pending: $NA

c. Related Support: List all other sources of support, pending or current, including federal (NIH, VA, NSF, etc.), foundation, industrial, or other. Give complete titles of all grants as well as total funding, yearly funding, funding for your salary, funding for your research, and inclusive funding dates.

Total Related Support: $NA

VIII. Lay Language Article

Date: August 2, 2015
Title of Project: Can horses distinguish between neurotypical and mentally traumatized humans?
Name of Principal Investigator: Katrina Merkies

While there is a growing body of research expounding the effects of equine-assisted activities (EAA) on humans, there is very little scientific research in the area of how EAA affect the horse. Humans working in the world of social work, psychology and psychiatry experience a high degree of stress. It is reasonable to assume that animals placed in similar environments would also experience stress. Understanding how the horse responds both physiologically and behaviourally in the horse-human interaction is a first step in understanding the experience from the horse's point of view. The hypothesis of this research project is that horses will distinguish between clinically "normal" humans and those experiencing psychological trauma (ie. PTSD) and respond differently even though exposed to the same external human behaviours (ie. the horse would respond to the emotional energy rather than purely the physical behaviours). Twenty horses will each be exposed to four neurotypical humans [control] and four humans diagnosed with PTSD [treatment]. The four control humans will be matched for age, size and gender to the treatment humans. Horses and humans will be outfitted with a heart rate (HR) monitor and horse salivary samples will be collected 30min prior to testing and 30min after each test to calculate cortisol concentrations as a measure of stress. A video camera will record all tests. Horses will be introduced individually into a familiar round pen. Baseline data will be collected for 5 min, after which the treatment human will enter the pen and spend 2 min with the horse, moving about the pen as he/she chooses. The human actors will view the video recordings of their paired treatment human to re-enact the same behaviours for the same duration. This re-enactment will not result in mirror scenes as the horse is not expected to perform exactly the same movements, but the human actor will move about the pen in the same fashion as his/her paired treatment human. Horse behaviours will be recorded every second (gait, head height in relation to the withers, ear and body orientation), distance from the human (in meters), and any physical contact with the human. A comparison of horse HR, cortisol concentration and behaviour data will determine differences between treatment groups. These results will significantly contribute to the direction and validation of future research on the impact of horses-human interactions. Understanding the horse's role in the processes involved in equine-assisted therapy is essential for furthering research into EAA not only from the human perspective, but from the lens of horse welfare to minimize stressful experiences for the horse and ensure participant safety.

IX. Biographical Sketch of Principal Investigator

Katrina Merkies, PhD

Associate Professor
Department of Animal & Poultry Science
University of Guelph
Guelph, ON, Canada. N1G 2W1
Phone: (519) 824-4120 x54707
E-mail: kmerkies@uoguelph.ca

ACADEMIC BACKGROUND

Degree	University	Year Granted
Ph.D. (Reproductive Physiology)	University of Guelph	1998
B.Sc. (Agr – Animal Science)	University of Guelph	1994

ACADEMIC, RESEARCH AND PROFESSIONAL EXPERIENCE

Position	Location	Date
Associate Professor	University of Guelph	10/2011-Present
LEAD Program Facilitator (Leadership through Equine-Assisted Discovery)	Kemptville Campus – University of Guelph	05/2009-Present
Assistant Professor	Lake Erie College – Painesville, OH, USA	08/2002-06/2006
Sessional Lecturer	University of Guelph, Animal & Poultry Science	09/2000-12/2000
Post Doctoral Researcher	University of Guelph, Animal & Poultry Science	04/1998-07/2002
Teaching Assistant	University of Guelph, Animal & Poultry Science	09/1994-12/2000

RESEARCH GRANTS

Year(s)	Source(s)	Title	Funding Amount
2015	International Society of Equitation Science	An industry view of prevalence and perception of horse welfare issues in Canada	$1400
2014	Ontario Ministry of Agriculture and Food	Can horses modulate their mechanical interaction with the ground surface to mitigate potentially harmful properties of the surface?	$47,649
2012	CCSAW	Response of horses to varying interactions with humans	$3820
2011	OMAFRA	The effect of two-stage weaning in horses	$20,000
2010-14	Infrastructure Operating Fund	Equine behaviour lab	$12,418
2008	Canadian Foundation for Innovation	An Integrated Animal Science Laboratory Complex for UfG Kemptville Campus	$248,266
2008	Ontario Ministry for Research and Innovation	An Integrated Animal Science Laboratory Complex for UfG Kemptville Campus	$248,265

RELEVANT CURRENT RESEARCH PROJECTS

- Brain organization in horses
- Trends in equipment use on horses
- Behavioural responses of horses upon interaction with humans
- A two-stage method for reducing weaning stress in horses
- Effect of whip use in racing horses
- Selection and discrimination by horses of different flavours
- Eye blink rates in horses
- Rider symmetry

PUBLICATIONS

I. Books

1. **Merkies K** (ed). Basic Horse Management and Handling, 2008. University of Guelph

II. Selected refereed journal publications

1. DuBois C, Zakrajsek E, Haley DB, **Merkies K**. 2015. *Validation of triaxial accelerometers to measure the lying behavior of adult domestic horses*. Animal 9:110-114
2. **Merkies K**, Sievers A, Zakrajsek E, MacGregor H, Bergeron B, König von Borstel U. 2014. *Influence of psychological and physiological arousal in humans on horse heart rate and behaviour*. J Vet Behav 9:242-247
3. von Borstel UU, Duncan IJH, Shoveller AK, **Merkies K**, Keeling LJ, Millman ST. 2009. *Impact of Riding in a coercively obtained Rollkür-posture on Welfare and Fear of Performance Horses.* App Anim Beh Sci 116:228-236

III. Selected conference presentations

1. **Merkies K**, McGreevy PD. 2015. *A preliminary investigation into relationships between equine skull morphology and brain organization.* International Society of Equitation Science, Vancouver. August 2015
2. Zakrajsek E, MacGregor H, **Merkies K**. 2014. *Response of light horse breeds to physically-exercised or fearful humans*. International Society of Equitation Science, Denmark. August 2014
3. Sylvia E, Stogryn M, Schittenhelm J, Bartkowski S, **Merkies K**. 2014. *Preliminary study of eye blink rates in horses in response to induced stressors*. International Society of Equitation Science, Denmark. August 2014
4. Faouën A, **Merkies K**. 2014. *The influence of rider handedness on rider position*. International Society of Equitation Science, Denmark. August 2014
5. Durand N, **Merkies K**. *Experience level of jockeys affects the use of the whip in Quarter Horse racing*. International Society of Equitation Science, Denmark. August 2014
6. Sharpe P, MacGregor H, **Merkies K**. *Correlation of estimated weight to scale weight in draft horses*. International Society of Equitation Science, Denmark. August 2014
7. Dubois C, Zakrajsek, Haley D, **Merkies K**. 2014. *Validation of triaxial accelerometers to measure the lying behaviour of adult domestic horses*. International Society for Applied Ethology, Ann Arbor, MI, May 2014
8. Dubois C, Marshal K, Parois S, Haley D, **Merkies K**. 2014. *Travel distance and duration of increased locomotion post-weaning in domestic pony foals*. International Society for Applied Ethology, Ann Arbor, MI, May 2014
9. **Merkies K**, MacGregor H, Ouimette M, Bogart E, Miraglia K. 2013. *Does the human voice have a calming effect on horses?* J Eq Vet Sci 33:368
10. **Merkies K**, MacGregor H, Ouimette M, Bogart E, Miraglia K. 2013. *The effect of human body posture on horse behaviour*. Campbell Centre for the Study of Animal Welfare Research Symposium, April 2013; International Society of Equitation Science, Delaware USA, July 2013
11. **Merkies K**, A Insensee, UU von Borstel-König, H MacGregor, A Tucker, R Bergeron. *Influence of psychological and physiological arousal in humans on horse heart rate and behaviour.* International Society of Equitation Science, Edinburgh, Scotland. July 2012
12. **Merkies K**, Haley D, Marshall K, Parois S. *Reducing weaning stress in horses*. OMAFRA research day, Guelph, June 2012

ANIMAL SUBJECTS
COMPLIANCE WITH GOVERNMENT REQUIREMENTS

The following statements are signed by an individual authorized to act for the institution and to assume on behalf of the institution the obligations imposed by the following:

The University of Guelph (Principal Investigator or Institution) agrees that if a research grant is awarded by the Horses & Humans Research Foundation (HHF) to Katrina Merkies (Applicant or Principal Investigator) for the project Can horses distinguish between neurotypical and mentally traumatized humans? (Project Title) and if animal subjects are used in any of the activities supported by such award, that it will comply with all applicable Canadian Department of Health and Human Services regulations with respect to the rights and welfare of such subjects.

To the extent allowable by the Province of Ontario, the University of Guelph (Institution) agrees to indemnify and hold HHRF harmless from any claims arising from such activities, and acknowledges that HHRF does not and will not assume responsibility for the subjects involved.

Please note that this research will be carried out in Canada and will abide by all laws and regulation for conduction research using animal subjects according to the Government of Canada.

SIGNATURE OF APPROVAL BY THE DEAN OR HEAD OF INSTITUTION ON BEHALF OF INSTITUTION

Signature

John Livernois, Associate VP, Research Services, University of Guelph

Type/Print Name and Title of Dean or Head of Institution

August 6, 2015

Date

HUMAN SUBJECTS

COMPLIANCE WITH U.S. GOVERNMENT REQUIREMENTS

The following statements are signed by an individual authorized to act for the institution and to assume on behalf of the institution the obligations imposed by the following:

The University of Guelph (Principal Investigator or Institution) agrees that if a research grant is awarded by the Horses and Humans Research Foundation (HHRF) to Katrina Merkies (Applicant/Principal Investigator) for the project Can horses distinguish between neurotypical and mentally traumatized humans? (Project Title) and if human subjects are used in any of the activities supported by such award, that it will comply with all applicable Canadian Department of Health and Human Services regulations with respect to the rights and welfare of such subjects. To the extent allowable by the Province of Ontario, the University of Guelph (Institution) agrees to indemnify and hold HHRF harmless from any claims arising from such activities, and acknowledges that HHRF does not and will not assume responsibility for the subjects involved.

Please note that this research will be carried out in Canada and will abide by all laws and regulation for conduction research using human participants according to the Government of Canada.

SIGNATURE OF APPROVAL BY THE DEAN OR HEAD OF INSTITUTION ON BEHALF OF INSTITUTION

Signature

John Livernois, Associate VP, Research Services, University of Guelph

Type/Print Name and Title of Dean or Head of Institution

August 6, 2015

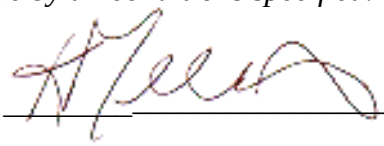
Date

XI. Research Grant Conditions of Award

1. At least one member of the research team must be fluent in English and published in peer-reviewed English language journals.
2. No institutional overhead or other indirect costs will be paid and should not be included as part of any grant request. A letter to your institution explaining this condition can be requested if needed. Beware that substantive equipment costs could work against the success of the grant request.
3. All funds awarded shall be used in accordance with the submitted and approved proposal and accompanying budget. Any unused portion thereof shall be returned to the Horses and Humans Research Foundation (HHRF). If an unforeseen problem occurs with the study design, notify HHRF immediately. Potential changes to the study design with additional financial assistance from HHRF may be considered to salvage the study and still lead to a favorable outcome.
4. Grant awards will be made in US dollars. Fifty percent will be awarded after the midpoint report is accepted and the remainder will be awarded when the project is fully completed, unless other arrangements have been specified and agreed to. The value of the grant will not be adjusted for inflation, cost over runs, or foreign exchange rate fluctuations. It is the responsibility of the recipient to manage these potential variables (example: if grant budget deals in euros, a loan could be purchased at the time of award, in US dollars, against the euro).
5. A one year grant period is assumed, unless otherwise specified in the application. At the midpoint of the grant period (6 Months) a progress report, financial report and invoice must be submitted for approval prior to receiving the first award check (up to 50%). A final report must be submitted within the agreed upon grant time line and must be approved before the final check is awarded. Projects that are incomplete within agreed time line may not receive final funding.
6. The Principal Investigator must assure HHRF of his or her intended work location. HHRF must be advised at the time of application of all moves, contemplated or real. Changes of address, phone number, fax number and email *within the same institution* must be promptly conveyed to HHRF. Changes in site location during a funded period must be approved by HHRF.
7. All publications (including poster abstracts at medical conferences) resulting from HHRF-funded research must include HHRF in a footnote/credit line/disclosure, and copies of such publications must be provided to HHRF. All publicity and information disseminated about such research must acknowledge HHRF support. This is an essential part of HHRF's conditions of award. Publicity or information about the project is used to keep supporters to HHRF informed about how their donations are being spent. This condition of award does NOT involve disclosure of any information that might jeopardize the applicant's ability to formally publish their findings.
8. The recipient of any research grant awarded must certify that any research, including work involving human and/or animal subjects, will be conducted according to the rules and regulations of the United States Department of Health and Human Services. The recipient must agree to hold HHRF harmless from any and all claims which may arise from any associations/issues related to such research.

9. All studies involving therapeutic riding horses must comply with accepted industry standards for care, treatment, and humane work load. All mounted work must comply with accepted industry standards for safety – including a certified instructor/therapist or evidence of equivalent standards. Therapeutic riding program sites must be accredited by or provide evidence of equivalent standards for facility safety.
10. A one year grant period is assumed. HHRF may approve the funding of a multi-year project, with funding of subsequent years pending the successful completion of the initial year. Applicants must consult HHRF prior to submitting a multi-year application.
11. Recipients of HHRF grants will be committed to a serious effort to publish resulting research findings in a peer-reviewed journal. HHRF will be kept informed of publication efforts.
12. All grant applicants must include one signed copy of this "Research Grant Conditions of Award" as a necessary part of their grant application to HHRF.
13. The Foundation reserves the right to terminate an award if the grant holder or staff funded by the grant is in breach of any of the conditions of award or becomes unfit or unable to pursue the work funded by the grant.

I have read and understood HHRF's "Research Grant Conditions of Award" and my signature below signifies that I agree to abide by all conditions specified.

Principal Investigator's signature:  Date: Aug 7, 2015

Principal Investigator's name and title (please print) _Katrina Merkies__

XII. Attachments Copy of IRB Application (with informed consent form), references, bibliography, charts, graphs and other supporting information as needed.

References:

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6920 Concession 1, Puslinch, Ontario N0B 2J0 • 519-837-0558 • Fax 519-837-1233
www.sunrise-therapeutic.ca • info@sunrise-therapeutic.ca

August 11, 2015

To whom it may concern:

Sunrise Therapeutic Riding & Learning Centre is pleased to be a part of supporting the research project, "Can horses distinguish between neurotypical and mentally traumatized humans?" led by Dr Katrina Merkies, Associate Professor at the University of Guelph between January 1, 2016 and December 30, 2016. Sunrise is planning to provide a testing facility, trained therapeutic riding horses, and certified staff to assist with this research endeavour.

Sunrise has operated as a charity since 1982 with the mission of developing the full potential of children and adults with special needs and leading them closer to independence through a therapy, recreation, horse riding, and farm related activity program. Specific programs growing out of this mission include:

- Therapeutic horseback riding for children and adults with special needs
- Integrated summer camps (designed to bring both abled-bodied and special needs campers together into an energetic farm and riding camp experience)
- "Life and work skills" day program for adults with special needs.

In addition, we seek to be a centre of excellence in the area of equine-assisted activities. Currently we are the only residential training school for therapeutic riding instructors approved by CanTRA (Canadian Therapeutic Riding Association) and in 2012 we completed a pilot research project with graduate students at McMaster University focusing on the qualitative effects of riding a horse on children with an Autism Spectrum Disorder.

Given this mission and the varied ways it is worked out through our programs, we are delighted to see growing interest in understanding equine-assisted activities. On a daily basis we see profound growth in children and adults with special needs coming out of some form of horse - human interaction. We believe there is tremendous value in focused research in these areas.

Sincerely,

Rob Vandebelt

CEO

Charitable No. 11920 6027 RR0001

UNIVERSITY of GUELPH

RESEARCH ETHICS BOARDS

Certification of Ethical Acceptability of Research Involving Human Participants

APPROVAL PERIOD:	June 21, 2013
EXPIRY DATE:	June 21, 2016
REB:	NPES
REB NUMBER:	13MY036
TYPE OF REVIEW:	Delegated Type 1
PRINCIPAL INVESTIGATOR:	Merkies, Katrina (kmerkies@uoguelph.ca)
DEPARTMENT:	Animal & Poultry Science
SPONSOR(S):	N/A
TITLE OF PROJECT:	Correlation between human personality and horse choice

CHANGES:

Date	Document Name	Version	Change Summary

The members of the University of Guelph Research Ethics Board have examined the protocol which describes the participation of the human participants in the above-named research project and considers the procedures, as described by the applicant, to conform to the University's ethical standards and the Tri-Council Policy Statement, 2nd Edition.

The REB requires that researchers:

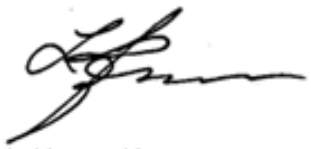
- Adhere to the protocol as last reviewed and **approved** by the REB.
- Receive approval from the REB for any **modifications** before they can be implemented.
- Report any **change in the source of funding.**
- Report **unexpected events or incidental findings** to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants, and the continuation of the protocol.
- Are responsible for **ascertaining and complying with all applicable legal and regulatory requirements** with respect to consent and the protection of privacy of participants in the jurisdiction of the research project.

The Principal Investigator must:

- Ensure that the ethical guidelines and approvals of facilities or institutions involved in the research are obtained and filed with the REB prior to the initiation of any research protocols.
- Submit a **Status Report** to the REB upon completion of the project. If the research is a multi-year project, a status report must be submitted annually prior to the expiry date. Failure to submit an annual status report will lead to your study being suspended and potentially terminated.

The approval for this protocol terminates on the **EXPIRY DATE**, or the term of your appointment or employment at the University of Guelph whichever comes first.

Signature: Date: August 2, 2015



L. Kuczynski
Chair, Research Ethic Board-General