Practical Resources for Therapeutic Horseback Riding Programs That Support Students on the Autism Spectrum

A portfolio submitted in partial fulfilment of the requirements for the degree of Master of Education

By: Allyson Lowe

April, 2020

Supervisor: Dr. Sonia Mastrangelo

Committee Member: Dr. Gary Pluim

Lakehead University

Acknowledgements

There are several individuals that I would like to personally thank for supporting me along this incredible journey. I want to give a heartfelt thank you to my supervisor, Dr. Sonia Mastrangelo for the suggestion to conduct this research project and for her incredible ongoing support, compassion and patience during the entire research process. I would also like to thank Dr. Gary Pluim, Dr. Connie Russell and Dr. Jan Oakley for their ongoing guidance and encouragement throughout my graduate studies.

During the summer and fall of 2019, I had the honour of working with an exceptional team of instructors, volunteers, students, parents and horses at WindReach Farm in Ashburn, Ontario. I would like to extend the biggest thank you to the instructors for giving up their valuable time and insight to help in the development of the curriculum manual. Thank you to the incredible volunteers for showing me the ropes and to the parents and students who allowed me to observe the wonderful connections of the human-horse bond.

Thank you to my dearest friends for inspiring me to pursue a graduate degree.

Thank you to my loving parents who always supported me in reaching my goals.

Lastly, a warmest thank you to my horses, Happy, Jake and Miss Molly for teaching me how to be the most confident, authentic version of myself.

Table of Contents

Chapter 1: Introduction

Purpose of Portfolio

Over the past decade, equine-assisted interventions have become increasingly popular as assistive programs for individuals with specialized needs (Gabriels et al., 2012) given the adaptability of these interventions and their ability to incorporate a variety of occupational therapies in a natural environment (Hallberg, 2018a). As a result of the increase in public and global interest towards equine-assisted interventions, there have been numerous studies revealing the benefits for a variety of targeted populations (Anderson & Meints, 2016; Bass et al., 2016; Borgi et al., 2016; Hallberg, 2018a; Lac, 2017; McDaniel Peters & Wood, 2017; Ratcliffe & Sanekane, 2009). Some of these populations include at-risk youth, individuals with exceptionalities, violent offenders, veterans suffering from Post-Traumatic Stress Syndrome, and autism spectrum disorders.

In the review of the literature on the benefits of therapeutic horseback riding for individuals on the autism spectrum, several authors highlighted a variety of limitations in the research which included: small sample size, lack of diversity within sample size, lack of control groups, no structured or standardized form of measuring participant progress, sessions not being individualized to participants, and no participant voice (McDaniel Peters & Wood, 2017; Ratcliffe & Sanekane, 2009; Vincent & Farkas, 2017). One major limitation recognized by a variety of researchers was the lack of detailed and well-designed *session structures* which is defined as the framework of how lessons or the overall programs are designed based on the participants' specific goals (Anderson & Meints, 2016; Bass et al., 2016; Borgi et al., 2016; McDaniel Peters & Wood, 2017; Ratcliffe & Sanekane, 2009; Rigby & Grandjean, 2016).

The objective of this portfolio was to design a curriculum guide to help support future therapeutic riding instructors in designing lessons for children and youth on the autism

spectrum. Furthermore, my portfolio includes approaches and resources that can serve as a form of professional development to educators seeking to learn more about this unique and holistic form of intervention. Overall, I hope this research will connect school boards and educational institutions to alternative programs (such as the one at WindReach) which allows students to benefit from both the human-animal bond and being in a natural, outdoor environment.

Rationale for Research Project

My rationale for pursuing this project is multifaceted. First, the project has a personal connection for me. I started riding horses at the age of 4 and participated in various riding disciplines from hunter jumper, dressage, eventing, and western pleasure. Horses have shaped my identity by teaching me valuable lessons and morals such as compassion, empathy, courage and a good work ethic. Caring for horses, completing daily barn chores before and after school, and competing and training horses, fostered many qualities in me such as perseverance, patience, and discipline.

At the age of twelve, I was fortunate to purchase my first show horse named Hot Lips Houlihan but who was known to me as Miss Molly. She was a Belgian warmblood cross and embodied what a mare is: pushy, stubborn, opinionated, feisty, headstrong and independent. It was through training and competing in a variety of local horse show circuits with Molly that I began to recognize the power of the human-horse bond. Molly taught me how to trust. When we were jumping or competing, she never let me down and always made me feel safe. One of my fondest memories of riding Molly happened at the championship of local schooling show series. During the competition, I was tied with another competitor and since this was Molly's last show circuit before her retirement, I wanted us to be successful. When I mounted Molly, the competitor rode past us looking much more confident and prepared than I was. At that moment, I felt really nervous and defeated, thinking we were not going to be

successful at this horse show. Within minutes, I felt as though Molly could read my body language and that she knew how much this show meant to me. She knew exactly what I was feeling in this moment and her entire body language changed from being tense and hyper-vigilant of her surroundings to relaxed and focused with her ears towards me, listening for any riding commands. It was almost as though she was expressing, "do not worry Ally, I got you." We finished in reserve champion at that horse show. I was blessed to have owned Molly for fifteen years until her passing last July.

In addition to the impact horses have had on my own development, I have also had the opportunity to see how horses are able to read people's body language and emotions when working at riding facilities, summer camps, and a local therapeutic riding centre. Through these experiences, I wish to combine my passion for horses with educational strategies to provide individualized interventions, programs, and curricula for at-risk youth and individuals with exceptionalities. My ultimate goal in life is to one day have my own therapeutic riding school where individuals can receive a holistic form of intervention and where I will be able to continue my research on the healing power of horses.

Between 2015-2017, I worked abroad in the United Kingdom as both an occasional and full-time teacher. During my first year, I taught in the borough of London in a variety of school settings in both low and high socio-economic areas. I also had the opportunity to teach in Special Educational Needs (SEN) schools. I observed students being sent to the SEN schools due to the lack of resources and support provided in the mainstream schooling system. These specialized schools were somewhere to go to instead of being a place where students could receive the individualized support they needed. Additionally, I observed that some of the staff resorted to physical measures in order to subdue students. There was one incident where I was asked to be a witness to allegations of physical abuse towards one of the

students by a teaching assistant. It is from these experiences that I am now driven to find alternative and holistic approaches to help individuals with special needs.

My main objective in pursuing this portfolio project is to find new and alternative learning strategies for children with a variety of exceptionalities. There are three components to my portfolio: (1) the literature review; (2) the action research project which entailed observing four certified therapeutic riding instructors and how they design lessons for children and youth on the autism spectrum; (3) the curriculum manual, which will serve to assist new therapeutic riding instructors in supporting children and youth on the autism spectrum who have challenges in one of the five self-regulatory domains (biological, emotional, cognitive, social and prosocial); (4) the sensory riding trail which will include various interactive activities in the natural environment that a child or youth on the autism spectrum can perform while on horseback to enhance learning that correlate with the senses, promote coordination, independence, language and communication skills, motivation and attention (New Zealand RDA, 2017).

From an academic standpoint, there are several reasons for utilizing and designing appropriate session structures for therapeutic riding. Providing a well-designed session structure can help participants benefit from the human-horse bond through specific approaches. Additionally, Bachi (2012) and Vincent and Farkas (2017) recognize the safety concerns of not having a well-designed session structure. Both authors state that the industry of equine-assisted interventions is growing rapidly and there is concern that there is not enough rigorous research to coincide with the introduction of new programs within the industry (Bachi, 2012; Vincent & Farkas, 2017). With the increase in public interest, more riding facilities are beginning to explore equine-assisted interventions for their clientele. However, without the support of sound research, there could be the potential for inadequate services provided to clients (Vincent & Farkas, 2017; Bachi, 2012).

It is evident that creating a curriculum manual would fill a gap recognized by researchers within this field. A curriculum manual would also be beneficial for future programs as it would allow instructors to modify lessons that are specifically tailored to those who are on the autism spectrum. In regards to my own future research, a curriculum manual would be immensely helpful in supporting my interest in how therapeutic horseback riding can improve sequencing and problem-solving skills in individuals on the autism spectrum. Developing a curriculum manual as part of my portfolio project would also benefit the wider educational community by connecting them to prospective equine-based programs.

My research project unfolded at WindReach Farm, a fully accessible and educational farm-based learning centre located in Ashburn, Ontario. WindReach Farm (2020) was founded in 1989 by Sandy Mitchell, who wanted to create a welcoming and inclusive environment where people of all abilities feel inspired and empowered. WindReach Farm "strives to enrich the lives of persons of all ages with disabilities and/or special needs by providing opportunities to enjoy experiences in farming, nature, outdoor recreation and other activities" (WindReach Farm, 2020, para.2). In order to achieve this mission, WindReach Farm (2020) provides five core services for clients using their facility. These include but are not limited to, Adult Day Services, Education and Recreation Services, Overnight Visitor Services, Volunteer Services and Equine Services. Their equine services provide recreational and therapeutic riding to the local Durham region as well as providing their facilities to the local Durham Region Therapeutic Riding Association as well as CanPraxis, an organization that helps veterans suffering from Post-Traumatic Stress Syndrome through equine-therapy (WindReach Farm, 2020).

In an interview with the Executive Director of WindReach Farm, Ross Ste-Croix emphasized the importance of making the programs that they already have in place stronger and more accessible to the wider educational community (Ste-Croix, personal

communication, 2018). Furthermore, Ste-Croix recognized the need for WindReach Farm to build stronger connections to the wider educational community (Ste-Croix, personal communication, 2018). Being a non-profit charitable organization, WindReach Farm (2020) relies heavily on the revenue obtained from their services in addition to donations from the public in order to keep their facility working. The design of the curriculum manual for this portfolio draws heavily upon the curriculum for students with autism spectrum disorder published by the Ontario Ministry of Education (2007), references many of the overall expectations found in the resource guide *Effective Educational Practices for Students with Autism Spectrum Disorder* and draws heavily on Dr. Stuart Shanker's book, *Calm Alert and Learning.* Community-based programs, such as the therapeutic riding program at WindReach Farm, can offer local school boards and their educators learning opportunities for students. A program such as the one at WindReach can provide students of all abilities the opportunity to receive a unique and alternative educational approach.

The curriculum guide I developed as part of the portfolio process was created to help support therapeutic riding instructors in designing lessons for children and youth on the autism spectrum. Furthermore, my portfolio incorporates approaches and resources that can serve as a form of professional development to educators seeking to learn more about this unique and holistic form of intervention. Overall, I hope this research will connect school boards and educational institutions to alternative programs (such as the one at WindReach) which allows students to benefit from both the human-animal bond and being in a natural, outdoor environment.

Chapter 2: Literature Review

Context of Literature Review

Historical Perspective

While research on equine-assisted interventions has only been recognized within the last decade, the therapeutic use of horses has been documented since ancient Greece. Gallen, Orebasius and Hippocrates all alluded to and prescribed horseback riding as a therapeutic exercise for their patients (Hallberg, 2018a; Selby, 2009). In addition, during the fifteenth to nineteenth centuries, physicians such as Chassaigne of France recommended riding to his patients to improve posture and balance. (Hallberg, 2018a; Selby, 2009). In 1670, Lord Thomas Sydenham in England suggested that riding a horse not only provided physical benefits, but was also a good treatment for depression and helped nurture the soul (Hallberg, 2018a; Selby, 2009). Indeed, during and following the First World War, Oxford Hospital in England would pair soldiers returning from battle with cavalry horses in order to help in their rehabilitation from both physical trauma and Post-Traumatic Stress Syndrome (Hallberg, 2018a; Selby, 2009).

However, even though the horse has been utilized for human physical and emotional development for centuries, it was not until the mid-1940s that institutions designed equine-assisted interventions. The first documented institution was created by Lis Hartel, a Danish Paralympian dressage rider (Hallberg, 2018a; Selby, 2009). Hartel recognized the benefits of horseback riding within her rehabilitation from polio and in collaboration with the medical hospital at the University of Copenhagen designed programs to help other individuals suffering from physical ailments through riding (Hallberg, 2018a). After observing the benefits of her programs within Scandinavia, more organizations were formed throughout the United Kingdom and elsewhere in Europe (Selby, 2009). It was in 1969 that equine-assisted interventions first came to North America. The Community Association for Riders with

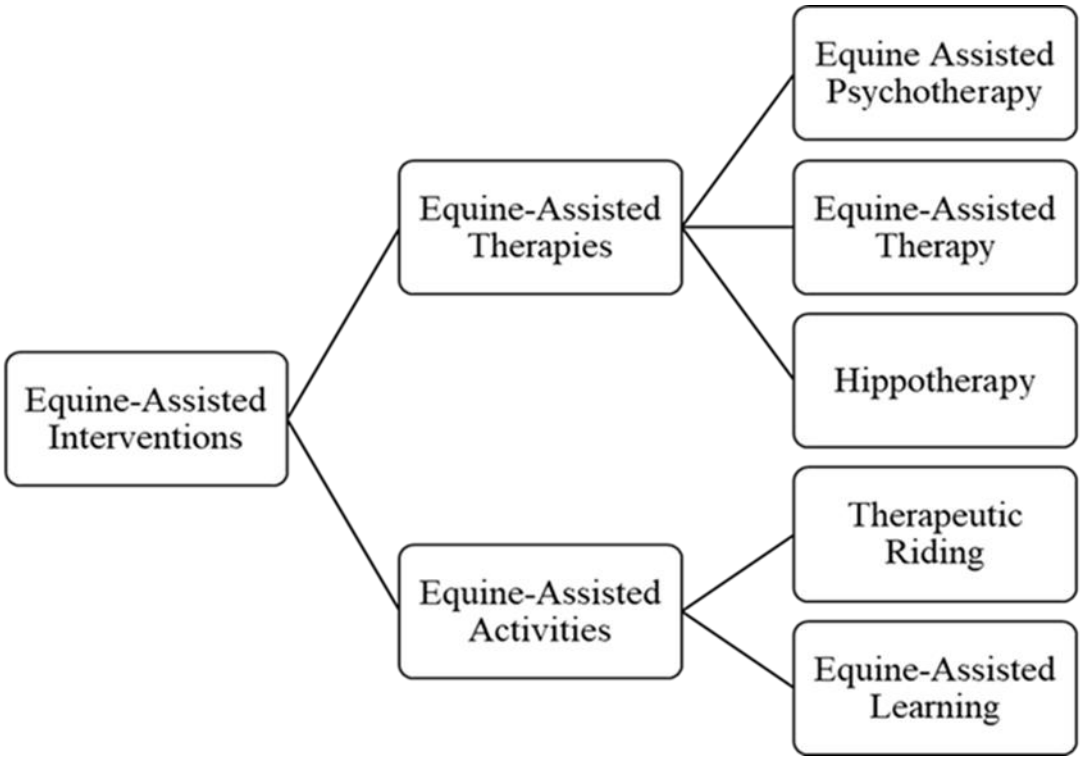
Disabilities (CARD) was established in Toronto by Dr. Reginald Renaud and Mr. Joseph Bauer (Hallberg, 2018a). Contemporaneously, the North American Riding for the Handicapped Association (NARHA) was established in the United States.[1] A worldwide governing body called Equine Assisted Growth and Learning Association (EAGALA) was established in 1999 to provide proper certification to potential equine-assisted programs and organizations (Darling, 2014).

Branches of Equine-Assisted Interventions

Equine-assisted interventions are also known as Equine-Assisted Activities and Therapy (EAAT) (MacDaniel Peters & Wood, 2017). Both Equine-Assisted Therapies and Equine-Assisted Activities each provide their participants with a specific intervention. Equine-Assisted Activities provide individuals with adaptive riding skills and educate them on how to care for a horse (Hallberg, 2018a). Conversely, Equine-Assisted Therapies incorporate the horse as a mediator or tool to facilitate therapy sessions with a licensed professional. These therapy sessions can be used to help specific physical, occupational, speech or mental health challenges the individual might be experiencing (Hallberg, 2018a). Under each of the branches of Equine-Assisted Therapies and Equine-Assisted Activities, there are specific services provided (as shown in Figure 1).

[1] NARHA would later change its name in 2011 to The Professional Association of Therapeutic Horsemanship International (PATH Intl.).

Figure 1: Services Provided Within Equine-Assisted Therapies and Equine-Assisted Activities



(Anderson & Meints, 2016, p. 3345)

Services Under Equine-Assisted Activities

Therapeutic Riding is a non-therapy skills-based service whereby instructors teach horseback riding and horsemanship skills to students with disabilities or special needs (Hallberg, 2018a). The discipline is not regulated by health care practitioners and does not follow a standardized protocol, allowing whoever runs the sessions to have variety in their approach (Hallberg, 2018a).

Equine-Assisted Learning can either be a mounted or non-mounted activity involving a horse that helps teach the individual life, social, communication or leadership skills (Hallberg, 2018a). These activities also help facilitate personal growth, self-awareness and self-regulation within participants. Certain activities include horse and barn management, understanding and observing horse behaviour, riding skills, etc. (Hallberg, 2018a).

Services Under Equine-Assisted Therapies

Equine-Assisted Therapy is administered by a licensed professional through various interactions and activities with horses to help with the specific physical, occupational, speech or mental challenges the individual may be facing (Hallberg, 2018a). Occupational and physical therapy may include using techniques such as social/emotional bonding, play, and caring for the horses to help clients with coordination, balance, movement, pain reduction and rehabilitation from previous injuries (Hallberg, 2018a). In regards to speech therapy, the movement of the horse can be utilized to help promote and integrate all body systems and sensory-motor development which are crucial to speech and language functions (Hallberg, 2018a). Furthermore, the social environment of the barn is also incorporated into speech therapy by providing discussion prompts about feelings related to the horse or instructions to the horse.

Examples of mental health issues that can be addressed through equine-assisted therapy include, "treating pathology, addressing abuse and trauma, and decreasing the symptoms of depression, anxiety and addiction" (Hallberg, 2018a, p. 37). The size of the horse, how it communicates with other horses, how it reacts to the environment, and the emotional bond established between human and horse are all utilized to help build confidence and self-esteem in the client (Hallberg, 2018a).

Equine-Assisted Psychotherapy is a specific type of mental health service that includes horses or the farm milieu. This service has to be conducted by a professional who has an accredited background in psychotherapy and/or psychology and is allowed by law to perform this mental health treatment (Hallberg, 2018a). Equine-Assisted Psychotherapy is a relatively new approach to mental health and institutions such as the Equine-Facilitated Mental Health Association, Equine Psychotherapy Institute, Human-Equine Alliance for Learning, Eponaquest, Human-Equine Relational Development Institute, and Federation of Horses in Education and Therapy International all have their own terminology and

approaches to this growing industry. However, all of the aforementioned institutions work on the premise that "change is most likely to occur through translating insight into action by the experience of new situations" (Lac, 2017, p. 15). Examples of activities within equine-assisted psychotherapy that can facilitate this process of self-improvement include: mucking out stalls, caring for a horse, sitting bareback on a horse, conducting groundwork, or simply observing a horse in the natural environment.

Hippotherapy is where "occupational, therapy, physical therapy, and speech-language pathology professionals use evidence-based practice and clinical reasoning in the purposeful manipulation of equine movement to engage sensory, neuromotor and cognitive systems to achieve functional outcomes" (Hallberg, 2018a, p. 41). Hippotherapy incorporates several components similar to therapeutic riding, however the main difference is that a medical practitioner is present to assist the client in targeted goals for their personal wellbeing (Lac, 2017).

Purpose of Literature Review

While all of the services highlighted under the umbrella of equine-assisted interventions utilize the human-horse bond to help a variety of target populations, for the purpose of this review I wanted to narrow down which interventions and specific program designs would benefit individuals on the autism spectrum. The purpose of this literature review is to summarize the research about programs which address the bond between individuals on the autism spectrum and horse participants. Questions that will be addressed within this review of literature will include: How do horses help in developing participant's overall wellbeing? How are learning sessions/interventions organized so participants on the autism spectrum are better able to achieve the full benefits of the human-horse bond? What outcomes are achieved for individuals on the autism spectrum from participating in equine-assisted interventions? Lastly, which program within equine-assisted interventions, equine-

assisted therapy or equine-assisted activities, provide the best results for participants on the autism spectrum?

The literature will explore specific equine-assisted interventions already in existence along with examples of good session structures. The review includes the benefits of the human-horse bond for individuals on the autism spectrum, strategies used to create that bond, the standards of best practice for both human and horse participants, and how programs are designed. The review will provide the research findings required to help others make informed decisions when creating their own programs. As part of my research portfolio, I created a curriculum guide for children and youth partaking in therapeutic riding lessons at a farm-based educational facility called WindReach Farm. In order to design a comprehensive curriculum guide, I needed to evaluate how experts in this field bridge theory and practice and how they achieve the human-horse bond within their sessions. Upon uncovering the findings by scholars in this field, I then evaluated current facilities that incorporate some form of equine-assisted interventions into the therapeutic setting in order to help individuals on the autism spectrum.

What is Autism Spectrum Disorder?

Before examining how the human-horse bond would benefit individuals on the autism spectrum, one must first understand the characteristics and diagnosis of this unique exceptionality. For my portfolio research, autism was chosen as the exceptionality to explore through the human-horse bond because it is "now recognized as the most common neurological disorder" (Ontario Ministry of Education, 2007, p.14) and diagnoses are increasing at a rate of approximately 1 in every 160 children (World Health Organization, 2019). Autism spectrum disorder is a diverse diagnosis that is highly dependent upon the individualized characteristics of each person (Simpson & Myles, 1998). Some individuals on the autism spectrum can have high cognitive ability and language skills and yet have

challenges with social interaction and daily living, while others have "significant intellectual disability or no expressive language and severe behavioural and social abnormalities" (Simpson & Myles, 1998, p. 3). Therefore, labelling autism as a spectrum of exceptionality with various subtypes and unique characteristics is necessary.

The symptoms of autism spectrum disorder are usually present before the age of three years and result in a diagnosis for life (Simpson & Myles, 1998, 3). Symptoms of autism spectrum disorder include but are not limited to: lack of or unusual social and sensory responses, delays in speech, repetitive behavioural patterns, limited eye contact, inability to recognize non-verbal communication and body language, and strong interest to a specific object (Simpson & Myles, 1998). Individuals on the autism spectrum can also have severe sensory responses to their environment that are atypical such as becoming upset over minor sounds, sights, odours or textures (McCoy, 2011). Also, depending on the severity of the diagnosis, individuals on the spectrum can experience heightened anxiety that can lead to uncontrollable behavioural patterns or tantrums (Grandin, 2010). In many cases, individuals with autism spectrum disorder turn to systematic behaviours and patterns in order to make sense of or to control the confusing environment around them (Simpson & Myles, 1998).

The diagnosis of autism spectrum disorder was first conceived during the 1940s and was often related to myths of bad parenting, but in fact, the exact cause of autism is unknown. There are several precursors that can lead to a diagnosis of autism such as: having children at a later age, pollution and pesticides, and premature births (Simpson & Myles, 1998). While a person on the autism spectrum may have some challenges that inhibit their daily function or ability to communicate with those around them, they also have several unique qualities and strengths. Some of these strengths include strong rote memory skills, unique perspectives to the world around them, attention to detail, and being visual learners (McCoy, 2011; Simpson & Myles, 1998). Fine (2011) and Grandin (2010) state that some individuals on the autism

spectrum think in pictures and interact heavily with their environment, which is known as sensory-based thinking. Animals are also constantly interacting with their environment and remember places/people based on pictures and scents (Fine, 2001). Due to this type of sensory processing, individuals on the autism spectrum find it easier to connect with/understand animal behaviour (Fine, 2001; Grandin, 2010). All of the challenges and unique characteristics related to autism spectrum disorder can be addressed through interactions with horses.

Understanding the Human-Horse Bond

Experts in the field of animal-assisted interventions have stated that the connections established between individuals on the autism spectrum and horse participants can be beneficial to both parties. Determining and understanding the foundations of the human-horse bond and its benefits will allow for a better understanding of how sessions should be designed in order to achieve a strong connection. Literature to date contends that the human-horse bond is rooted within three distinct theories: attachment theory, learning theory and I-Thou theory. Attachment theory relates to Maslow's hierarchy of needs where social relationships are critical to a person's psychological wellbeing (Fine, 2011). With regards to horses, attachment theory is explored through the process of "holding" which is classified into three distinct experiences: "the physical sensation of being held while on horseback; the natural setting within a horse barn which provides a nonthreatening environment; and the acceptance and non-judgemental nature of the horse" (Lac, 2017, p.39). Here the non-judgement nature of the horse and the supportive environment play a critical role in fostering a trusting, secure attachment for an individual on the autism spectrum (Lac, 2017). Furthermore, the process would also connect to learning theory in that if a participant with ASD finds the learning experience enjoyable and worthwhile, they will feel comfortable enough to return to this experience or form of therapy in the future (Fine, 2011).

Martin Buber's I-Thou theory is helpful in understanding the complex formation of the human/horse bond. I-Thou theory is the process or space needed for humans to shift their perception of an animal from being inanimate, used for personal gain or a tool, to being a sentient being (Lac, 2017). The process of I-Thou and getting an individual on the autism spectrum to experience the here-and-now is a critical step in building the human-horse bond, as it begins with the foundation of trust. It is changing the mindset that the horses are only there as a tool for the participant's personal gain to being viewed as their companions or friends (Birke, 2008). In order to develop trust, the horse needs to feel safe in order to express their own intentions (Birke, 2008). When the relationship is built with the horse, both the human and horse are able to adjust to situations together and to tackle obstacles as a pair rather than the human controlling the horse on where to go (Birke, 2008).

Furthermore, not only is the process of I-Thou essential in building the human-horse bond, but it could also have a significant positive impact for an individual on the autism spectrum. Two major challenges that some individuals on the autism spectrum experience are the inability to relate to another individual or show empathy as well as being fixated on a certain object instead of the present moment (Simpson & Myles, 1998). Incorporating techniques and strategies used in the process of I-Thou theory could have a plethora of benefits for an individual on the autism spectrum allowing them to connect with and be present within another being.

There is an array of benefits that result from achieving the human-horse bond. Some physical benefits for human handlers include but are not limited to: "lowered blood pressure, decreased risk of cardiovascular disease, increased motivation to exercise, decreased doctor visits and increased tolerance for pain" (Hallberg, 2018a, p. 20). While the physical benefits can be applied to any target populations, the human-horse bond can also have a profound impact on the cognitive and behavioural development of individuals on the autism spectrum.

Research indicates that human participants are able to focus and be attentive to a therapy animal for long periods of time (Fine, 2011). Also, horses in particular, are able to mirror and project the emotions of the human participants (Lac, 2017; Strossi, 2014). For example, if a participant is anxious or exhibiting stress behaviour, the horse will feed into that behaviour and also become anxious. This instant biofeedback allows the human participants to have stronger insight into their own behaviour and non-verbal cues (Kohanov, 2001; Strossi, 2014). With the support of the therapist or instructor who is using guiding questions and prompts, an individual with ASD can learn self-regulatory skills.

It has also been documented that being around animals in general can have significant benefits for individuals with high levels of anxiety or stress, which is often exhibited frequently by those on the autism spectrum. The simple act of petting an animal can release oxytocin receptors in the brain (Fine, 2015). Furthermore, the "presence of animals can sometimes exert calming or de-rousing effects on people" (Fine, 2011, p. 27). Lastly, Temple Grandin, an expert within the world of animal-assisted learning and also diagnosed with autism, states that she often reacts to certain environmental triggers that are similar to that of herd animals, like cows and horses (Grandin, 2010; Montgomery, 2012). Due to the fact that they both perceive the environment around them in similar ways, she feels very connected to animals over humans (Grandin, 2010). In relation to Grandin's perspective, researchers have revealed that participants on the autism spectrum, who may often feel embarrassed, uncomfortable or simply unable to express their feelings to another human being, find it much easier to relay those feelings to animals since they will not be judged (Fine, 2011). By forming that bond it allows an individual with ASD to learn how to create emotional connections with others in a meaningful way. But in order to reap the benefits that horses can offer to human participants on the autism spectrum, it is first crucial to grasp the successful strategies and approaches used.

Strategies to Achieving the Human-Horse Bond

"If you act like you've only got fifteen minutes, it'll take all day. Act like you've got all day and it'll take fifteen minutes" (Roberts, 1998, p. 255). This proverb is well-known within the world of natural horsemanship. Monty Roberts is one of the leading natural horsemanship trainers whose work has been recognized internationally (Roberts, 2005). When building the human-horse bond, it is a process that occurs over a period of time and cannot necessarily be mastered within one small session (Buzel, 2016; Irwin; 2001; Lac, 2017; Strozzi, 2014). While horse trainers such as Monty Roberts are able to build that bond within a period of half an hour, they have had years of experience and knowledge in understanding a horse's behaviour and emotions. But for participants who have never encountered a horse before their session, the instructor needs to follow a process in order to achieve a successful bond.

According to Hallberg (2018b) and Lac (2017), the first step in the process of developing a bond is observation. "One of the best ways to connect to nature and understand animals is to be present in the natural environment without actively influencing it" (Hallberg, 2018b, p. 20). By observing the horses in their natural environment, it allows the participant to gain insight into horse behaviour and herd dynamics (Kohanov, Lac, 2017; Strossi, 2014). Furthermore, the participants are beginning to enter into what is known as the sharing space which is one of the first crucial steps of the human-horse bond (Lac, 2017). Herein, the participant begins to recognize that they are interacting with another living being, without directly entering into their physical space (Hallberg, 2018b; Lac, 2017). Depending on the cognitive and emotional development of the participant, it also allows them to have an awareness of the present moment and what emotions they might be feeling at that time (Lac, 2017). However, it is up to the facilitator to provide questions and prompts that are developmentally appropriate in order for the participant to respect the horse, learn how they

interact with one another, understand the needs of the horse and be embodied in the present moment.

Observing horses in their natural environment would be exceptionally beneficial for individuals on the autism spectrum because it serves as a calming, self-regulating activity and also provides opportunities for the instructor to discuss nonverbal communication signals that horses use to interact within one another. Horses use subtle gestures in order to: warn one another that they are too close, show respect, or to welcome them into their sharing space (Lac, 2017; Strossi, 2014). Gestures that demonstrate respect include direct eye contact and ears forward, alert and paying full attention to the needs of the other horse (Kohanov, 2001). On the contrary, disrespectful or threatening gestures include only showing one eye (side profile), the swishing of the tail, ears pinned back or the stomping of hooves (Kohanov, 2001). Demonstrating physical gestures such as eye contact, facial expressions, head-nodding as well as nonverbal social-communication skills like paying attention and sharing one's intention are often challenges that individuals on the autism spectrum face when interacting with others (McCoy, 2011). Therefore, observing horses in their natural environment provides an excellent learning opportunity on how nonverbal communication is an important way to interacts with others for those on the autism spectrum.

Closely following observation and the careful selection of a horse companion, is the first interaction or physical touch between human participant and horse. According to Lac (2017), the first touch between the human participant and horse companion is incredibly important. Physically solidifying the bond can bring both physiological and psychological effects to the human participants (Lac, 2017). Petting and interacting with a horse provide an opportunity to pay full attention to not only how the horse responds to the touch and interaction, but also to what the human participant is feeling in that present moment (Lac, 2017). The interaction is a non-verbal experience that "leads to a sense of freedom in not

having to explain or rationalize the experience through simply being allowed to be present with the horse, sharing space" (Lac, 2017, p. 62).

Through the guidance of a facilitator or instructor, there are an array of unmounted groundwork activities and exercises that a human participant can have with their horse companions in order to experience the physiological and psychological benefits of touch. Buzel (2016) provides a variety of session ideas that could easily be applied to the target population of autism spectrum disorder. One idea includes both the instructor and participant going into the horses' paddock or an arena where the horse is free, quietly walking towards them with arms extended and palms out, letting the horse know that they are wanting to touch them (Buzel, 2016). The instructor will then let the human participant touch the horse's nose and subsequently walk back, releasing the pressure. By releasing the pressure, it is like asking the horse if the individual can enter their space and show that they are not threatening (Buzel, 2016). With the guidance of the instructor, they will continue this process until the horse feels comfortable and will begin to walk forward toward the participants. The process allows for both the participant to learn to respect the space of the horse, gaining the trust of the horse and welcoming them into the sharing space.

Another excellent exercise that Buzel (2016) suggests which would benefit an individual on the autism spectrum, is getting them to walk to the side of the horse, and slowly placing their hands over the horse's chest, gentling massaging and looking for where their body sends out very strong pulses. Through this simple interaction, the individual can figure out where the horse likes to be pet which helps build that physical bond (Buzel, 2016). During this activity, the instructor can also incorporate mindfulness breathing. Horses are the perfect example of the power breathing has on one's ability to be focused and mindful in the present moment (Buzel, 2016). Horses use deep breathing as a way to regulate the herd, or

fast, shallow breaths to communicate any potential danger or injury (Kohanov, 2001; Buzel, 2016).

Utilizing the breath of a relaxed, calm horse in a breathing exercise with humans can "affect regulation: a person's ability to calm down after an exaggerated emotional response via somatic cues such as deep and quiet breathing" (Buzel, 2016, p.39). Here the instructor will ask the participant to place one hand on the horse's withers and one on his/her chest. They will then ask them to place an ear on the horse's neck and ask the individual to try and breathe with the horse, which is quite difficult as a calm, relaxed horse breathes much slower than a human (Buzel, 2016). The exercise can provide both an opportunity to create a stronger bond with the horse but also to learn mindful, self-regulatory techniques. If during the exercise the individual's breathing begins to increase, the horse might react and provide biofeedback by being more alert and anxious (Buzel, 2016). It is at that moment the instructor can use this form of biofeedback as a teachable moment to understand how horses mirror one's own emotions and stress responses, which can in turn help improve one's emotional regulation.

If the participant does not feel comfortable entering the horse's environment another suggested activity would be grooming the horse in cross ties where the participant is able to physically interact with the horse in a safe environment (Buzel, 2016, Hallberg, 2018a). Grooming the horse also mimics the horse to horse social interaction of mutual grooming, which is the biggest display of trust and affection between horses (Kohanov, 2001). Grooming also allows the participant to learn where the horse does or does not like to be touched (Hallberg, 2018a).

Proceeding groundwork, mounted activities can provide human participants with special needs including autism spectrum disorder, a strong sense of empowerment since they are able to connect with the horse's movement (Kohanov, 2001; Lac, 2017). Riding a horse

can "increase body awareness through bi-lateral coordination, spatial perception, motor planning and control skills, as well as increase tactile, vestibular, and proprioceptive senses" (Lac, 2017, p. 41). Furthermore, "the release of endorphins and oxytocin as a result of physical exercise and contact with the horse can increase a client's sense of self through building confidence and feelings of well-being" (Lac, 2017, p. 41). Clearly, how the instructor designs the mounted lessons can have substantial benefits for the human participant's overall health and well-being. However, mounted sessions may not offer the same connections between horse and human participants since they are no longer on an equal level. In order to ride the horse, the human has to establish dominance over the animal-participant (Irwin, 1999). Therefore, the instructor should provide activities where the horse and rider progress together, rather than the human controlling the horse. Incorporation of subtle verbal commands and body cues, known as natural riding aids, will maintain the respect for the horse as a sentient being.

Application of Selected? Educational Constructs to the Human-Horse Bond:

Vygotsky's Proximal Development

Lev Semyonvich Vygotsky (1978) was an educational theorist in Russia during the early to mid-20th century. Vygotsky's (1978) most predominant theories were based on child and language development. He also emphasized the importance of incorporating play and practical experiences into the learning of a child (Vygotsky, 1978). One theory developed by Vygotsky (1978) was the zone of proximal development, which is essentially the incorporation of scaffolding and achievable challenges for the student. Vygotsky (1978) believed that a child's actual developmental level and learning capacity is limited when they have to complete a problem-solving task independently. However, when working collaboratively with peers or under the guidance of an adult, the student's level of potential

development is greater and he/she is more capable of grasping the problem-solving task (Vygotsky, 1978).

Trotter (2012) connects Vygotsky's (1978) zones of proximal development to horses in that horses "are a powerful motivator for learning because (1) learning is retained more when individuals are emotionally invested; and (2) learning is maximized when it occurs within significant relationships" (pg. 6). In relation to the zones of proximal development, the bond that occurs between students and horses gives the student a stronger sense of self and ability to trust the learning process (Trotter, 2012).

Trotter (2012) also elaborates on the learning environment within the riding sessions and its impact on the cognitive functioning in individuals.

> With the simple act of brushing a horse, the midline of the body is crossed activating the corpus-callosum in the brain, which will stimulate the centres for learning. Riding stimulates the tactile senses both through touch and environmental stimuli. The movement of the horse, with changes in direction and speed, stimulates the vestibular region of the brain. The olfactory system will respond to the many smells surrounding a stable and ranch environment. Vision is stimulated during control of the horse. The many sounds of the ranch help to involve the auditory system. All of the senses work together and are integrated in the act of riding and horse-related activities. In addition, proprioceptors are activated, resulting in improved spatial awareness. It is because of this factor that horses can be extremely effective for children and adults with sensory processing disorders. (p. 205)

It is evident that the relationships developed among the students, the horse and instructors create a supportive environment where the development of learning is explored through challenging activities in the riding sessions. However, the multisensory environment will also contribute to the learning since it activates various cognitive functions such as the vestibular and proprioceptors in the brain and body as well as vision, olfactory, and auditory systems.

Stuart Shanker's Five Domains of Self-Regulation

In his text *Calm, Alert and Learning: Classroom Strategies for Self-Regulation*, Stuart Shanker (2013) notes that children with special needs have difficulties coping with high amounts of stress as well as processing and making meaning of multisensory stimuli.

Furthermore, Temple Grandin (2011) states that individuals with ASD can be hypersensitive to various stimuli. Several studies have indicated that horses can have significant benefits in helping children and youth with ASD self-regulate their emotions and behaviour, improve their social motivation and interaction, as well as decrease inattention, distractibility, irritability and hypersensitivity (Bass et al., 2009; Gabriels et al., 2012; Ward et al., 2013). Although horses can support youth with ASD in developing self-regulatory skills incorporating too much stimuli in a therapeutic riding lesson could be overwhelming for the student.

Shanker (2013) suggests that one must first focus on the physical domain to help reduce any hypersensitivity to noise or visual stimuli. Here the instructor can focus on gradually introducing the multiple stimuli of the barn and riding environment, the horses and staff members. Also, the instructor needs to create a calming environment and to be aware of any stimuli that might trigger hypersensitivity in the student. Shanker (2013) also highlights the benefits that play and physical activity can have in up-regulating (increasing energy and tension) or down-regulating (decreasing energy and tension) a child. Within the curriculum manual and sensory trail, I will incorporate teaching strategies and learning activities that an instructor can use in their lesson in order to increase or decrease the energy or tension within the rider. Applying or reducing energy and tension for the rider will put them in the area of optimal learning where both the neocortex and limbic systems are engaged (Shanker, 2013).

Lastly, Shanker (2013) and Fine (2011) address that animals can have an immense impact on the emotional, cognitive, social and pro-social domains for children/youth with special needs. Individuals with ASD in particular use sensory-based thinking where they store information based on stimuli, such as pictures and sounds (Fine, 2011). Children and adults with ASD share similar sensory processing with animals, such as horses, because animals also store their memories through pictures or sounds (Fine, 2011). Since animals and

individuals with ASD use similar sensory-based thinking they are able to relate and understand each other better than individuals who think in words. This mutual understanding and way of nonverbal communication can be highly beneficial to students who may have difficulty in the social and pro-social domains.

Current Studies Exploring the Benefits of Human-Horse Interactions through Therapeutic Horseback Riding

While there are several programs under both equine-assisted therapy and equine-assisted activities that benefit children and adolescents on the autism spectrum, the majority of the most recent and reputable studies have fallen under the equine-assisted activity of therapeutic horseback riding. Unfortunately, since research on the benefits of therapeutic horseback riding has only gained momentum within the last decade, there are a limited number of studies that have included high-quality procedures and produced favourable results. Each of the studies evaluated provides their own unique approach to therapeutic horseback riding and yet reveal similar benefits for those with autism spectrum disorder. The programs have targeted areas such as: systematic and maladaptive behaviours, social and communication skills, and sequencing/problem-solving.

There are only two studies that focus on the benefits of therapeutic riding on self-regulatory behaviours in children on the autism spectrum, both conducted by Gabriels et al. in 2012 and 2015 respectively. Gabriels et al. (2012) first study, *Pilot study measuring the effects of therapeutic horseback riding on school-age children and adolescents with autism spectrum disorders*, consisted of forty-six participants, all non-verbal and between the ages of six to sixteen. Participants took part in a ten-week therapeutic riding program at an accredited PATH International riding centre. The sessions were designed to have a therapeutic riding element as well as teach participants horsemanship skills in order to measure their self-regulatory and adaptive skills during the lessons. Gabriels et al. (2012) concluded that there

was significant improvement in self-regulatory challenges such as irritability and hyperactivity as well as an increase in expressive communication in participants who participated in the therapeutic riding lessons as compared to the control group.

The second study conducted by Gabriels et al. (2015), *Randomized Controlled Trial of Therapeutic Horse Back Riding in Children and Adolescents with Autism Spectrum Disorder* was designed to further build on the results from the first study in 2012 with a continued focus on self-regulatory and adaptive skills with an additional focus on social and motor behaviours. Gabriels et al.'s (2015) second study followed a similar procedure to the previous study which was conducted over a ten-week program at an accredited PATH International riding centre and included both therapeutic and horsemanship riding skills. In this study, Gabriels et al. (2015) also observed reductions of stress in participants. Gabriels et al. (2015) emphasized the desire to conduct future research on how the human-horse bond plays a role in the development of self-regulatory capacities.

A vast majority of the studies that evaluated the benefits of therapeutic horseback riding for children and youth on the autism spectrum focused on the improvement in social functioning and communication skills. A frequently cited study that targets improvement in social and communication skills was conducted by Bass, Duchowny & Llabre (2009). The program design and procedure conducted by Bass et al. (2009) has been utilized by many other researchers because of the detailed step by step description outlining unmounted activities and adaptive riding lesson components used in their study. The Bass et al. (2009) study took place at an accredited PATH International riding centre in Florida, United States and included thirty-four participants. Over a twelve-week program, Bass et al. (2009) found that participants had improved social functioning and reduced sensory seeking behaviours that also resulted in diminished irritability and inattention.

Utilizing and following the procedure of Bass et al (2009), Al-Hmouz & Arabiat (2015) conducted a similar study where they created a twelve-week riding program in Jordan. The purpose of their study was to build from Bass et al.'s (2009) findings to see if a therapeutic riding program in Jordan would help the population of children and youth on the autism spectrum with social functioning and communication skills as well as reducing behavioural outbursts. The study included forty-five children and youth on the autism spectrum ranging from ten to fourteen years old. The participants were separated into two study groups, the experimental testing group who would be participating in the therapeutic riding program and the control group (Al-Hmouz & Arabiat, 2015). The results of their study found significant improvement in social and communication skills with a particular focus on language development, focus attention and non-verbal gestures (Al-Hmouz & Arabiat, 2015). One significant addition to their study was the incorporation of grooming and personal interactions with the horse that was not seen in some of the other studies. However, one drawback to this study was they did not confirm whether the facility that they used was accredited with an overseeing body, therefore causing questions regarding the standards of practice used.

A study by Ward et al. (2013) also focused on the benefits of therapeutic horseback riding on communication skills in children on the autism spectrum. However, their methodological approach was much different from that of other researchers since they had participants take part in an accredited therapeutic riding program and then stop it for a period of time to see if the benefits obtained through the therapeutic riding program continued once the intervention stopped. Ward et al. (2013) found that there were positive changes in social functioning and communication skills during therapeutic riding sessions but these changes were not maintained once the program stopped. Clearly, their results indicate that therapeutic riding needs to be an ongoing treatment in order to produce long-lasting benefits.

There was one study conducted by Anderson & Meints (2016) with a focus on social functioning and communication skills, that did not produce any increase in these areas but instead revealed an increase in empathy and reduction in maladaptive behaviours. Anderson & Meints (2016) *Brief Report: The Effects of Equine-Assisted Activities on the Social Functioning in Children and Adolescents with Autism Spectrum Disorder*, created in the United Kingdom provided an exceptional overview of the different categories and programs under the umbrella of equine-assisted interventions. The chart that was created for this literature review to show the breakdown of the different programs/disciplines was actually inspired by the one created from their study (refer to page 9). Compared to the other studies, Anderson & Meints (2016) only had fifteen participants, ranging from five to sixteen years of age and were mostly non-verbal. The study took place at an accredited riding centre, under the British Horse Society (BHS) and Riding for the Disabled (RDA), that had been established for twenty years. In their results, Anderson & Meints (2016) found no change in social and communication skills but found improvements in the participants' ability to demonstrate empathy when interacting with horse companions, stating that the participants consistently wanted to be in "direct physical contact with the horse" (p. 3349). Anderson & Meints (2016) note that the results did not show improvement in social functioning and communicational skills possibly due to the small sample size and limited program timeframe of just six weeks.

There were also two studies that explored the benefits of therapeutic horseback riding on attention, sequencing and problem-solving skills in children and youth on the autism spectrum. The first study, *an experimental analysis of the effects of therapeutic horseback riding on the behaviour of children with autism* was conducted by American researchers Jenkins & DiGennaro-Reed (2013) and focused on the participants' behaviour and attention when asked to perform tasks during therapeutic riding lessons. The study only included seven

participants between the ages of six and fourteen (Jenkins & DiGennaro Reed, 2013). The therapeutic riding sessions occurred after school at a local therapeutic riding centre and the researchers did not reveal if the riding centre was accredited under PATH International. The study took place over a nine-week time frame (Jenkins & DiGennaro Reed, 2013). Jenkins & DiGennaro -Reed (2013) concluded that while they did not see any major effect on attention behaviours, they did see some improvement in language development. Jenkins & DiGennaro-Reed (2013) did discuss however, that there were several limitations related to their study with regards to sample size, lack of input with how the lessons were designed and that the program structure may have been too short to see any major benefits in attention.

A study conducted by Borgi et al. (2016) revealed benefits in executive function, sequencing and problem-solving in children on the autism spectrum through the incorporation of both mounted and unmounted activities with horses. The study included twenty-six male participants on the autism spectrum, all in the age range of six to twelve, who took part in a session once a week over a six-month period (Borgi et al., 2016). The study took place at a riding centre associated with the Italian Equestrian Federation and had various accredited instructors that came from different riding stables to participate in the study (Borgi et al., 2016). They concluded that therapeutic horseback riding can result in significant improvements in social and executive functioning in children and youth on the autism spectrum especially with regards to reduced latency to problem solving tasks.

Lastly, the study *Therapeutic Horseback Riding Outcomes of Parent-Identified Goals for Children with Autism Spectrum Disorder: An ABA' Multiple Case Design Examining Dosing and Generalization to the Home and Community* conducted by Holm, Baird, Kim, Rajora, D'Silva, Podolinsky, Mazefsky & Minshew (2013) examined how the benefits of therapeutic riding on children on the autism spectrum could be transferrable to their home environments. The study by Holm et al. (2013) included parents and researchers evaluating

target behaviours previously discussed between both parties and documented any improvements in social functioning, hyperactivity and systematic behaviours during the riding lesson and at home. Holm et al. (2013) found that there was a decrease in systematic behaviours as well as an increase in social functioning skills, which also transferred over to the home environment. While the purpose of the study was to determine if therapeutic riding would be an adequate treatment option where skills could be transferable to everyday life, there were some limitations to the study with only three participants as well as concerns of parents claiming benefits, leading to possible skewed results.

Results revealed in each study do demonstrate that the interactions between participants and horses can have a significant benefit for children on the autism spectrum and can be a viable treatment option. The studies do indicate however that there are a lot of variations within the research (sample size, timeframe, lack of standardized curriculum) and some also highlighted where there could be more one-to-one interaction with the horse that could add additional benefits (such as Al-Hmouz & Arabiat, 2015; Anderson & Meints, 2016; Borgi et al., 2016). Therefore, the studies support the premise that there is a benefit related to interactions between horses and participants but that different approaches and strategies might need to be explored.

Discussion: Gaps Within Literature Regarding the Benefit of the Human-Horse Bond for Individuals on the Autism Spectrum

While reviewing the literature on achieving the human-horse bond has provided me with a strong insight into the type of programs that I believe would be beneficial for individuals on the autism spectrum, there were many gaps that I feel still need to be addressed through continued research. Many of the programs and research studies had good flow and followed a slow process over many weeks (5-10 weeks) to establish a connection between the human participant and horse. The studies also provided critical aspects regarding

standards of practice and safety for both human and horse participants. However, one aspect that was not explored in great depth was what happens after the program is completed. *Equine-Facilitated Psychotherapy and Learning: The Human-Equine Relational Development (HERD) Approach* by Veronica Lac (2017) was one of the very few texts that highlighted equine-assisted programs as being on-going. Lac (2017) discusses how the program includes: (1) understanding the goals of the client; (2) a needs assessment; (3) the design of the equine-assisted program 4) delivery of experimental learning through the equine-assisted program and (5) program evaluation and follow up. Once the follow-up session is complete, Lac (2017) then goes back and revaluates the next steps for the client. Again, while all the other literature highlighted the learning and benefits that occurred during the sessions, Lac (2017) was the only scholar that recognizes that the learning cycle is an on-going process.

However, while Lac (2017) does provide exceptional program design, it is tailored to a variety of target populations in a generalized manner and not specifically for those on the autism spectrum. She does focus heavily on Attention-Deficit Hyperactivity Disorder (ADHD) when referring to several case studies in her text, but still, her approach is meant to be a generalized approach to equine-therapy. I have yet to review any other text that highlights on-going learning specifically for individuals on the autism spectrum and is outside of a five to ten-week program for a targeted need within a research study.

Another gap within the literature is that only a few stated how the knowledge or skills learned within the sessions applied or were transferrable to everyday life. There were texts such as Buzel (2016), Kohanov (2001); Lac (2017), Nussen & Becker (2012); and Strozzi (2014) who either made the transfer of skills to daily life an essential part of their program or at least touched on it. But again, all of these texts were focused on how the human-horse bond can apply to a variety of target populations and not just solely on autism spectrum

disorder. With relation to the studies examined that do focus on autism spectrum disorder, the authors also highlighted changes in behaviour, attitude, outlook or development of participants as they progressed through the program and they did explore how it impacted the participants' everyday life. While harnessing the human-horse bond can clearly have such a powerful impact on individuals on the autism spectrum, this is a gap that needs to be addressed in future research through longer term-systemic interventions.

The last and most significant gap identified within the literature is a lack of application and connection between equine-assisted interventions to the educational community such as school boards, private schools, special educational schools, universities or higher education. The *Handbook on Animal-Assisted Therapy: Theoretical Foundations and Guidelines for Practice*, edited by Aubrey Fine (2011), was the only research piece that provided suggestions for future program design and made connections to the wider educational community. However, other than Green Chimneys, (which is a private school for special educational needs where animals are incorporated into the learning), Fine (2011) does not provide any other examples of where current programs have an on-going relationship with school boards or other educational institutions. This is disconcerting as my research is based on creating a curriculum guide for therapeutic riding that connects therapeutic riding facilities to local school boards in Ontario. If there are limited program designs currently in place for the autism population, it will be a challenge to share and implement my own curriculum guide with the wider educational community. However, developing a curriculum manual with a focus on therapeutic horseback riding for individuals on the autism spectrum, could provide the opportunity to explore how other animal-assisted interventions and farm-based/outdoor activities support the overall wellbeing of children and youth with special needs. Additionally, a curriculum guide could spur greater practical, evidence-based research on the benefits of human-animal interactions for children and youth with special needs.

Reflection of Literature: What is the Ideal Equine-Assisted Program for Individuals on the Autism Spectrum?

After reviewing a wealth of literature about achieving the human-horse bond for individuals with both special needs and those on the autism spectrum, equine-assisted intervention articles provide a variety of techniques and strategies in order to target a specific need for that participant. Furthermore, when exploring the techniques and strategies in greater detail, I discovered an ideal program structure that could cater to the gamut of needs experienced by individuals on the autism spectrum. The ideal program structure would follow a strong standard of best practice where the facilitator, therapist or instructor will meet with the client/client's family in order to gain the context of their particular challenges and begin an appropriate plan of action. Once that is established, the facilitator or instructor will then begin the sessions with an introductory lesson observing the horses in their natural environment (paddock) in order to understand or witness the use of nonverbal communication within the herd. Following that introductory lesson, the instructor will then proceed with a targeted program that either includes both unmounted groundwork exercises/activities and mounted adaptive riding that are tailored to the specific need of the participant. The program should also include the participant's family to help promote social interaction, empathy development, self-regulatory skills, and communication and language skills.

However, when reviewing the literature about creating the human-horse bond, my beliefs about the ideal equine-assisted program for individuals on the autism spectrum has changed. I had previously been adamant that therapeutic riding was the best service under the umbrella of equine-assisted interventions because it could provide both the benefits of the human-horse bond and the learning of a new skill set when riding a horse. However, upon reviewing the literature/studies that were geared toward therapeutic riding (such Anderson & Meints (2016), Bass (2009), Borgi (2016), Gabriels (2012) and Holm et al. (2017)), I felt that

while there was some discussion on the bond between human participant and horse and its benefit, the connection between rider and horse was not the main focus. I also noticed that in some of the studies (Al-Hmouz & Arabiat, 2015; Anderson & Meints, 2016; Gabriels, 2012; Jenkins & DiGennaro Reed, 2013; Ward et al. 2013) although there was an appreciation for the horse, the horse was still viewed as a tool for the participant and not so much a partner in the process.

From examining each program structure, the best way to create the human-horse bond and to benefit from it is through unmounted activities. The reasoning for this is that the human participant has to learn more about body language, non-verbal cues and energy output from the horse. Also, the human participant has more control over the horse when riding, either through personal direction or assistance from side walkers/leader. Whereas on the ground they learn that the horse has the right to make its own decisions. This is further supported by the work of Buzel (2016); Hallberg (2018b), Kohanov (2001); Lac (2017); Nussen & Becker (2012) and Strozzi (2014) who provided either lesson examples or case studies where they used groundwork to build the connection between human and horse. I also felt that while several of their examples were geared toward a variety of target populations, some strategies would be highly beneficial to individuals on the autism spectrum. On the other hand, none of the studies or texts that were geared toward mounted activities provided any detailed lessons on how the human-horse bond could be achieved through mounted work. Therefore, a strong human-horse bond could be achieved through mounted exercises but the available literature that explores this phenomenon is scarce.

Upon this discovery, I have concluded that if I am to create a therapeutic riding program in the future for my curriculum manual that focuses on those with autism spectrum disorder, it has to have groundwork/unmounted activities or exercises before the participant can proceed to learning to ride the horse which ensures the participant will benefit from the

emotional connection with the horse and the horse will be able to build that trust with the human participant. When the human participant then proceeds to the riding section of the program, they will have a stronger respect for their horse companion and recognize them as a sentient being as they go through the lesson. Which in turn the human participant will be more observant to the needs of the horse. This process or program decision will evidently be more mutually beneficial to both parties in changing the traditional way of thinking from the horse being a tool to being a sentient being.

PART2: Review and Evaluation of Current Equine-Assisted Programs

In order to obtain a strong understanding on how an ideal equine-assisted program should be designed to best support individuals on the autism spectrum, I needed to look at current, fully established facilities that offer one of the services under the umbrella of equine-assisted interventions. In this literature review, I selected, reviewed and evaluated four programs in particular that each caters to a specific population of autism spectrum disorder. The goal of this process is to recognize unique and specifically tailored programs/sessions that offer opportunities for a person with autism to benefit from the human-horse bond.

Green Chimneys

Located in Brewster, New York, Green Chimneys is one of the few fully established facilities that combines farming, equine-assisted therapy and animal-assisted therapy within a school setting (Green Chimneys Organization, 2020). Green Chimneys (2020) focuses on incorporating and combining academics within a behaviourally and emotionally supportive learning environment for children with a variety of different exceptionalities. Green Chimneys operates two campuses. The Brewster campus provides both a day and residential school for children that are unsuccessful in traditional mainstream schooling and the Carmel campus provides a smaller day schooling program (Green Chimneys Organization, 2020).

They both provide variety of nature-based and animal-related programs for the broader educational community (Green Chimneys Organization, 2020).

All programs and schooling are overseen by certified special education professionals or by individuals with graduate degrees in fields related to the human-animal bond (Green Chimneys Organization, 2020). Green Chimneys is considered the exemplar of institutions that harnesses the human-animal bond to benefit a wide population of children who are in need of an alternative learning environment (Fine, 2011). Another interesting point about Green Chimneys (2020) is that student enrolment at the school is actually covered by the student's local school district that provides funding for their programs. However, some parents who may have difficulty getting their local school district to pay for the enrolment can choose to pay for their child's tuition (Green Chimneys Organization, 2018).

All of the nature-based and animal-related programs connect with the learning that occurs within the classroom setting (Green Chimneys Organization, 2020). They currently have over two hundred animals at their facility located on a 350-acre farm. Also located on the farm is a teaching barn, horse barn and wildlife centre that provide nature-based programs to over 10,000 students per year (the majority of those students are from the broader educational community) (Green Chimneys Organization, 2020).

One of the main programs at Green Chimneys (2020) is their equine education and intervention program. There are five main components of their equine education program which include: equine-assisted learning, equine-assisted psychotherapy, therapeutic riding, therapeutic carriage driving and barn management (Green Chimneys Organization, 2020). Green Chimneys' equine education program is a certified premier facility under PATH International and is a leading place for research for the International Association of Human-Animal Interaction Organizations (IAHAIO). The IAHAIO along with the Institute for Human-Animal Connection out of the University of Denver hosted a conference at Green

Chimneys in the spring of 2019, which provided future researchers and educators knowledge on how to design programs to achieve the human-animal bond (Green Chimneys Organization, 2020). I had the privilege of attending this conference.

It is evident that Green Chimneys is a wonderful example of how programs should be designed in order to form strong connections between animals and children with special needs and also to connect those programs to the wider educational community. In the spring of 2019, I attended the IAHAIO conference and the knowledge I acquired there will assist me with future designs that I hope to implement at facilities offering a service under equine-assisted interventions. The only critique is that their target population is grades K-12 and does not provide as many programs for adults with special needs. I believe that there could be more opportunities or programs they offer for all ages.

WindReach Farm

WindReach Farm (2020) is a 105-acre property that provides educational and nature-based programs to the wider community of Whitby, Ontario. WindReach Farm (2020) was founded in 1989 by Sandy Mitchell. As a child, Sandy was diagnosed with cerebral palsy and struggled to find farm-based programs that were offered to all abilities (WindReach Farm Organization, 2020). When Sandy moved to Canada from Scotland, he purchased a piece of farmland and decided to begin building an inclusive and educational centre for individuals of all ages and abilities (WindReach Farm Organization, 2020). One of Sandy's first programs was equine services, providing therapeutic riding lessons to local schools (WindReach Farm Organization, 2020). WindReach Farm's (2020) therapeutic riding program has now grown substantially and currently has over one hundred students, all ranging in ages and ability. Also, out of that population of students, a majority are on the autism spectrum. WindReach Farm (2020) therapeutic riding program is CanTRA certified which requires their facilities to have a high standard of care and proper certification of instructors.

In addition to their therapeutic riding program, WindReach Farm (2020) also provides a variety of other programs such as community engagement, life skills, horticulture, day visits and adaptive sports. WindReach Farm (2020) provides a fully accessible facility and a sensory trail for children and adults to interact with nature. One of their main educational programs is Beyond the Farmgate, where they take several small animals such as guinea pigs, rabbits, chickens, etc. to local community centres, schools, retirement homes and organizations (windreach.org, 2018). Through this program, people are able to receive the therapeutic benefits that animals provide in addition to learning to interact with animals they would not usually engage with (WindReach Farm Organization, 2020).

While WindReach Farm (2020) provides a variety of beneficial programs, a majority of their clientele only attend for day visits or participate in a program a few times per week. WindReach Farm (2020) does not provide schooling or residential services to their clients. Furthermore, WindReach Farm's (2020) programs are usually provided to parents or guardians wishing to have their child/family member participate with some educational opportunities for local school boards to send their special education classes to their facility. The therapeutic riding program does have a great connection with the Durham Catholic School Board in that special education teachers can send some of their students once a week for a short riding session which also includes grooming the horses and learning about barn management (Bullock, personal communication, 2018). There is still a lot of growth and connection that could be made to the wider educational community in order to utilize the programs offered and ultimately benefit from bonds formed with the animals on the premises.

Furthermore, WindReach Farm (2020) only provides therapeutic riding as their form of equine-assisted intervention. While there are bonds formed through this type of intervention as previously stated, incorporating further groundwork and unmounted activities associated with equine-therapy would have a substantial benefit through the human-horse

bond to enhance the overall well-being and quality of life for their clients on the autism spectrum. WindReach Farm (2020) does offer their riding facility to Can-Praxis, an organization that uses equine-therapy to help veterans suffering from PTSD. While this is an excellent service, Can-Praxis oversees the sessions themselves and none of the staff at WindReach Farm (2020) partakes in the sessions (Bullock, personal communication, 2020). Therefore, one suggestion to the equine-assisted program at WindReach Farm is to incorporate more activities or exercises associated with equine-assisted therapy.

Healing Hooves

Healing Hooves (2019) is an equine-assisted therapy, psychotherapy and professional development program located in Cremona, Alberta. Healing Hooves (2019) offers counselling services to those with a variety of needs including anxiety, depression, trauma, parent-child conflict, ADHD, attachment struggles and disorders, grief and loss, self-esteem struggles, stress and behavioural problems. For each of these diagnoses or situations, Healing Hooves (2019) provides a detailed description of how horses help to improve symptoms related to a specific challenge. Their mission is to "nurture our clients' discovery, healing and growth through respectful and ethical counselling services, parent consulting, professional training and resources, within the context of mutually beneficial relationships and interactions with horses and other animals" (Healing Hooves Organization, 2019, para. 1).

The facility at Healing Hooves (2019) is associated with several professional overseeing bodies which include EFW Canada, Canadian Counselling and Psychotherapy Association, Alberta College of Social Workers, Neufeld Institute, CanTRA and PATH International. All counsellors at Healing Hooves (2019) are required to be trained through the Neufeld Institute that embeds its programming in attachment theory. Healing Hooves (2019) also speaks highly of the important and integral role that their equine-therapists play in helping establish the human-horse bond and attachment for clients. They then expand to

discuss how this bond and attachment can help their clients heal and overcome challenges or obstacles in their lives (Healing Hooves Organization, 2019). In addition, Healing Hooves (2019) provides a strong code of ethics with regards to every member of their program: clients, horses, counsellors and their professional practice. Within the code of ethics for their animal partners, Healing Hooves (2019) states that they regard their horses as sentient beings, deserving respect and dignity, cherish their unique personalities, to never incorporate practices that could physically, verbally or emotionally abuse their animals and to make sure that the horses are provided with utmost care.

It is clearly evident that as a program geared towards equine-assisted therapy, Healing Hooves (2019) provides a high standard of practice for all parties involved. Their services have also been recognized in the local and national media such the Globe and Mail, Alberta Herald and Canadian Horse Journal (Healing Hooves Organization, 2019). Their session designs incorporate new and innovative approaches such as therapeutic stories for children, ages five to twelve, that introduce storytelling with the horses which relate to a certain theme of development (Healing Hooves Organization, 2019). Another benefit is that they provide detailed manuals and resources such as their therapeutic stores for children to help other professionals in this field (Healing Hooves Organization, 2019). Furthermore, Healing Hooves (2019) provides a variety of professional training and workshops for anyone pursuing equine-assisted therapy as a career. Since this is a career path that I wish to pursue in the future, I will consider taking part in one of the workshops.

The only gap that I see within their program is similar to the one at WindReach Farm (2020). While the services provided can be covered through medical insurance or “funded through Children’s Service, Supports for Permanency or Family Supports for Children with Disabilities”, there is no link to providing services/programs to the wider educational community. However, it is noted that clients have to be referred to this service through

accredited institutions, therefore designing programs directly with school boards could be difficult.

High Hopes

While attending the Triennial Conference, hosted by the International Association for Human Animal Interaction Organizations (IAHAIO) at Green Chimneys in April 2019, I was introduced to the therapeutic riding facility at High Hopes. High Hopes is located in Connecticut, United States and for the past forty-five years has been considered an exemplar for all therapeutic riding centres with regards to standards of practice, training of future therapeutic riders and ongoing research in the profession (High Hopes Organization, 2020). High Hopes is only one of six facilities that can provide the three-level instructor certification exam through PATH International; helps in the design of curriculum for PATH International therapeutic riding programs, and has successfully trained two hundred riding instructors from across the globe (High Hopes Organization, 2020).

After hearing about High Hopes through the IAHAIO conference at Green Chimneys, I wanted to explore what aspects of their therapeutic riding organization make it so successful and recognized on an international level. First, High Hopes offers several equine programs such as therapeutic riding, therapeutic carriage driving, equine-assisted learning, regular riding lesson to the local community, and veteran support programs. One video on their website also highlights a particular client who, unfortunately, due to his Cerebral Palsy, could not participate in regular riding activities (High Hopes Organization, 2020). High Hopes then decided to have the client take part in therapeutic carriage driving in a carriage specifically designed for his particular needs (High Hopes Organization, 2020). The client has accredited High Hopes for having a significant impact on his life and giving him the life skills, he needs to succeed in other life ventures (High Hopes Organization, 2020).

Furthermore, there are several features associated with High Hopes that I did not necessarily see in the other therapeutic riding centres evaluated. One aspect, in particular, is that High Hopes openly provides on their website, demographic information about their programs, such as client population, finances, strategic plans, what programs are most popular/utilized as well as including their improvement plans and their commitment to help better their programs. With regards to statistics and annual reports, High Hopes, has provided services to those affected by forty-six different diagnoses and autism spectrum disorder is the largest client population they serve (High Hopes Organization, 2020).

High Hopes is also taking part in an upcoming research study with The Therapeutic Riding Assessment of Impact Network (TRAIN) to create different attainment scaling methods which will measure outcomes of riders taking part in therapeutic riding lessons to utilize in future studies (High Hopes Organization, 2020). They have participated in one study, *Building Capacity for Evaluating Outcomes in Therapeutic Riding Using GAS and a Collaborative Approach: A Summary of the Lessons Learned* conducted by Smith Hybels (2014) where two therapeutic riding facilities, one being High Hopes, were involved in introducing Goal Attainment Scaling (GAS) to therapeutic riding practices. High Hopes also provides internships and consulting services to help educate future instructors/facilities on best practices (High Hopes Organization, 2020). Lastly, out of all of the equine programs and centres evaluated, High Hopes is the only facility that has a sensory trail which they utilize on a regular basis to enhance the learning and experiences of their clients (High Hopes Organization, 2020).

High Hopes is an exemplary facility I hope to explore more fully in order to adapt my own programming in the future. The only suggestion is for High Hopes to expand upon their level of engagement with local school boards and provide better programming to connect to educational communities. However, when looking upon the 2019 Annual Report, High Hopes

highlights that one goal going forward is to build on their "recent collaborations with local social services agencies and area schools, focus on programs which respond to the critical substance abused and mental health needs of our region (High Hopes Organization, 2020, 3). I think that this particular focus of their improvement plan and mission statement will be an aspect I will closely follow in the upcoming months. As stated previously within the literature review, the benefits of the human-horse bond to mental health are of interest of mine. Therefore, after reviewing High Hopes in greater depth, I believe it is a highly regarded facility that will support my research, curriculum manual and on-going practice.

Conclusion

Through this careful exploration of the strategies used by experts in the field of equine-assisted interventions and the human-horse bond, coupled with the evaluation of high-quality programs that apply these approaches to practice to support individuals on the autism spectrum, I plan to take this newfound learning and apply it to a standardized curriculum manual. While there are many strategies, educational constructs and benefits that the human-horse bond has on supporting individuals on the autism spectrum, there are still many gaps within the literature and practical resource guides on how to specifically build that bond. The concepts and approaches uncovered in the literature review assisted me in developing a curriculum manual that will provide a variety of activities for future therapeutic riding instructors to utilize within their lessons with a high standard of practice.

Chapter 3: How the Tasks Were Created

I grew up on a horse farm outside of Barrie, Ontario and since then horses have always been an integral part of my life. Often, I would refer to them as my closet companions and I certainly benefitted from the therapeutic benefits they provide. Additionally, during my time as an educator, I have become very passionate about supporting students with special needs and providing them opportunities to reach their fullest potential. Over time, I began to realize the benefits that therapeutic riding could have on students with special needs and I wanted an opportunity to bring my two greatest passions together. Fortunately, the portfolio route in the M.Ed program allowed me to do this. My portfolio includes a scholarly component (the literature review), a technical component (the curriculum manual) and a creative task (the sensory riding trail).

During the fall of 2018, my supervisor Dr. Sonia Mastrangelo introduced me to the staff at WindReach Farm in Durham. She was already in the midst of developing a prospective research project on self-regulation. During one of her visits at WindReach Farm, Dr. Sonia Mastrangelo had informed the executive director and members of the board about my research interests and they were keen for me to conduct my research at WindReach Farm. Shortly thereafter, I contacted the executive director, Ross Ste. Croix and together decided on the plan to design a curriculum manual for their therapeutic riding program with a focus on children and youth on the autism spectrum. My learning journey included the development of a literature review on the benefits of equine-assisted interventions for students on the autism spectrum. My second task involved the development of a curriculum manual for educators (see Chapter 4) that was based on my action research at WindReach farm (observations and 1:1 interview with riding instructors). For my third task I created a sensory riding trail (see Chapter 5). This portfolio is a reflection of the inspiration I drew from the therapeutic riding

instructors at WindReach and the knowledge I acquired from seminal works, such as Dr. Shanker's *Calm, Alert and Learning,* which helped framed my curriculum manual.

Chapter 4: A Therapeutic Riding Curriculum Manual for Students on the Autism Spectrum

Introduction

Understanding the Human-Horse Bond and its Benefits

The benefits of the human-animal bond are profound and form the foundation for exploring how it can be utilized in structured interventions. The human-animal bond has been defined in various ways. Ethologist, Konrad Lorenz argued that a human's wish to keep and take care of an animal represented a longing to connect with nature (Fine, 2011). Leo Bustad (1983), the founder of the idea of human-animal interactions, argued that the bond between humans and animals "is similar to human functions that go hand in hand with the emotions of love and friendship in the purest and noblest forms" (p. 5). The last definition of the human-animal bond was suggested by both Barba (1995) and Beck (1999), where the bond between human and animal is similar to the relationship between parents and their children. This last definition has also been referred to "motherese" where humans have an intense attachment to their animals and feel a strong requirement to protect and care for them (Fine, 2011, p. 5).

There has also been a wealth of research discussing the benefits that the human-animal bond has on humans. Some physical benefits for human handlers include: "lowered blood pressure, decreased risk of cardiovascular disease, increased motivation to exercise, decreased doctor visits and increased tolerance for pain" (Hallberg, 2018a, p. 20). Fine (2011) also provides social and cognitive benefits from animal interaction such as increased oxytocin receptors, reduction in anxiety, improved concentration as well as increased compassion and empathy towards all living beings.

Horses, in particular, have been documented to have specific benefits for humans. It has been argued in a variety of texts, that horses' ability to mirror and project the emotions of the human, allows the human to explore deeper, unexplored areas of their psyche (Buzel,

2016; Kohanov, 2001; Lac, 2017; Strozzi Mazzucchi, 2015). Furthermore, horses are not judgemental, as their only demand from humans is to feel protected and safe (Strozzi Mazzucchi, 2015). Therefore, the human-animal bond can be highly beneficial for students with special needs since the interaction requires them to constantly be self-regulating their behaviour and begin to connect and care about what the horse is feeling (Buzel, 2016; Shanker, 2013).

The impact that equine-assisted interventions have on children with communication and intellectual exceptionalities is also significant. Students are required to provide voice commands to the horse and as a result, research has recognized a significant increase in social engagement as well as language development (Al-Hmouz & Arabiat, 2015; Ward et al, 2013). Animals, including horses, also respond with non-verbal communication and mirror the emotions of the participant (Anderson & Meints, 2016: Trotter, 2012). Additionally, since horses have been found to improve participants' emotions, students struggling with social interactions are able to read non-verbal cues and develop an increased sense of self. As a result, Hallberg (2018a & b), a mental health practitioner who has done extensive work in equine-assisted therapy, observed her clients demonstrate improved self-regulation and stress management skills and increased displays of empathy and motivation.

Children and youth on the autism spectrum have also demonstrated an increased development in their transferable skills within their riding sessions such as following commands, providing riding cues to the horse and following a series of sequences of tasks through games and steering activities (Borgi et al, 2016; Scott, 2005). In addition, the multisensory environment and the requirements of horseback riding such as: balance, steering the horse, maintaining an upright sitting position, following the instructor's directions and listening to the horse, requires multitasking skills of the students (Scott, 2005).

Why Therapeutic Horseback Riding?

Although therapeutic riding is unregulated by the health care system in both Canada and the United States, it has many benefits in comparison to other equine services. Therapeutic riding allows instructors to design lessons that are individualized to a particular student, while still teaching them riding skills. Learning to ride a horse will boost students' confidence as they acquire the new skill set of learning to ride a horse. Furthermore, students will be able to receive physical activity through riding and partake in engaging games to enhance a variety of physical, cognitive, social and emotional skills. Most importantly, therapeutic riding sessions, if designed alongside a trained professional who has followed a particular set of criteria, can provide strategies from each of the services under the equine-assisted interventions industry.

Therapeutic riding is the most recognized and popular choice of equine-assisted interventions for students on the autism spectrum (Hallberg, 2018a). Furthermore, autism is the second most chosen exceptionality by researchers to investigate the benefits of therapeutic riding (Hallberg, 2018a). Therefore, although there is a wide selection of studies on therapeutic riding and its benefits for students on the autism spectrum, a curriculum manual will help instructors develop strong session/program structures and/or provide a framework for how lessons are delivered.

Location of Therapeutic Riding Program for Research Project: WindReach Farm

During the summer and fall of 2019, I had the privilege to observe lessons at the therapeutic riding program at WindReach Farm, a fully accessible and educational farm-based learning centre located in Ashburn, Ontario. WindReach Farm (2020) was founded in 1989 by Sandy Mitchell who wanted to create a welcoming and inclusive environment where people of all abilities feel inspired and empowered. Sandy Mitchell, diagnosed with cerebral palsy himself, recognized the benefits of horseback riding to his own overall well-being and

wanted to make it a core component of his programs at WindReach Farm (WindReach Farm, 2020).

WindReach Farm "strives to enrich the lives of persons of all ages with disabilities and/or special needs by providing opportunities to enjoy experiences in farming, nature, outdoor recreation and other activities" (WindReach Farm, 2020, para 2). In order to achieve this mission, WindReach Farm (2020) provides five core services for clients using their facility. These include but are not limited to, Adult Day Services, Education and Recreation Services, Overnight Visitor Services, Volunteer Services and Equine Services. Under each of the core services, there are a variety of programs that WindReach Farm (2018) offers to their clients such as Learning 4-Life Adult Day Program, the Get Outside! adaptive sport and recreation program, Beyond the Farm Gate program, integrated summer day camps for children, Harvest of Health Horticultural Therapy Program, Homespun Wool Program and a variety of others.

Under their equine services, WindReach Farm provides "therapeutic and recreational horseback riding lessons to students with special needs" (Windreachfarm.org, 2018, para.1). Furthermore, WindReach Farm (2018) is a facility certified under the Canadian Therapeutic Riding Association CanTRA that offers training and certification to potential instructors. They also offer their facilities to the local Durham Region Therapeutic Riding Association as well as CanPraxis, an organization that helps veterans suffering from Post-Traumatic Stress Syndrome through equine-therapy (WindReach Farm, 2018).

Research Project

In order to develop practical strategies for inclusion in a curriculum manual, I observed and participated in therapeutic riding lessons overseen by certified instructors. I had the opportunity to observe four exceptional riding instructors at WindReach Farm over a period of three months and how they develop lessons and activities for children and youth on

the autism spectrum. Data obtained from both observations and interviews have become a crucial element in the design of this curriculum manual.

Methodology

In order to observe the instructors and their lessons, I had to receive ethics approval and provide a detailed overview of the research project to all of the instructors involved. Each instructor was provided an information package that included an overview of the research project, what the lesson observations and one-to-one interviews would entail, my plans to design a curriculum manual, and the compensation they would receive for their involvement in the one-to-one interviews (refer to Appendix A for participant information letter given to instructors detailing the research project and Appendix B for consent form provided to instructors).

I also obtained permission from parents/guardians of students on the autism spectrum who wanted to participate in the project (refer to Appendix C for participant information letter for parents/guardians and Appendix D for consent letter provided to parents). Parents and guardians were informed of the research project through email sent by WindReach Staff and flyers advertising the research project. Parents and guardians were invited to an informational evening prior to data collection in order to receive clarification on the research process and project. The information session also allowed parents/guardians to know more about my role and the work I would be engaged in.

Throughout the observation period, I observed a total of eight students, all of whom ranged in ability and had their own specific strengths and learning goals. During lessons, I participated as either a leader or sidewalker, interacting with students and following the direction of the riding instructor. The focus during every lesson was to observe specific strategies, activities and instructional tools, etc. that were utilized by instructors to help their students reach a targeted goal. I observed every student at least two to four times throughout

the research period in order to determine how the students were able to work towards specific learning goals with the support of the instructors. Some students were observed more than others due to summer vacation schedules which resulted in student absences from riding lessons. Proceeding every lesson, I would take observational notes on strategies, learning goals and activities I thought would be particularly beneficial to the self-regulatory needs of children and youth on the autism spectrum.

Following the observational period, I conducted one-on-one interviews with the four instructors participating in the research project. Interview questions were comprised of strategies used to develop the human-horse bond for students on the autism spectrum (see Appendix E for a list of questions asked during the interview), how to set up the learning environment in order to best support children and youth on the autism spectrum, strategies or lesson ideas that align with each of the self-regulatory domains (biological, emotional, cognitive, social and prosocial) and an exploration of passion for therapeutic riding. Following observations and interviews, all of the learning activities and strategies were organized under the appropriate self-regulatory domain (please refer to Appendix F for instructor responses to interview questions).

This curriculum manual is comprised of a combination of data collected from lesson observations and interviews, as well as strategies and activities suggested by experts in the field of equine-assisted interventions. The majority of the observations taken from data collection to be included in this curriculum manual will fall under mounted activities as information obtained from resources on equine-assisted interventions will be utilized in unmounted activities. By combining observations taken from the research project in addition to strategies taken from additional resources, the manual will provide future therapeutic riding instructors with an array of strategies to support children and youth on the autism spectrum.

Supporting Children and Youth on the Autism Spectrum

What is Autism Spectrum Disorder?

Autism spectrum disorder is a diverse diagnosis that is highly dependent upon the individualized characteristics of each person (Simpson & Myles, 1998). Some students on the autism spectrum have excellent cognitive abilities and language skills and yet have challenges with social interaction and daily living, while others have "significant intellectual disability or no expressive language and severe behavioural and social abnormalities" (Simpson & Myles, 1998, p. 3). Therefore, labelling autism as a spectrum of exceptionality with various subtypes and unique characteristics is necessary.

The symptoms of autism spectrum disorder are usually present before the age of three and results in a diagnosis for life (Simpson & Myles, 1998, p. 3). Symptoms of autism spectrum disorder include but are not limited to: lack of or unusual social and sensory responses, delays in speech, repetitive behavioural patterns, limited eye contact, inability to recognize non-verbal communication and body language, and strong interest to a specific object (Simpson & Myles, 1998). Students on the autism spectrum can also have severe sensory responses to their environment that are atypical such as becoming upset over minor sounds, sights, odours or textures (McCoy, 2011). Also, depending on the severity of the diagnosis, students on the spectrum can experience heightened anxiety that can lead to uncontrollable behavioural patterns or tantrums (Grandin, 2011). In many cases, students with autism spectrum disorder turn to systematic behaviours and patterns in order to make sense of or to control the confusing environment around them (Simpson & Myles, 1998).

While a person on the autism spectrum may have some challenges that inhibit their daily function or their ability to communicate with those around them, they also have several unique qualities and strengths. Some of these strengths include strong rote memory skills, unique perspectives to the world around them, attention to detail, and being visual learners

(McCoy, 2011; Simpson & Myles, 1998). Fine (2011) and Grandin (2011) state that some students on the autism spectrum think in pictures and interact heavily with their environment, which is known as sensory-based thinking. Animals are also constantly interacting with their environment and remember places/people based on pictures and scents. Due to this type of sensory processing, children on the autism spectrum find it easier to connect with/understand animal behaviour (Fine, 2001; Grandin, 2008). All of the challenges and unique characteristics related to autism spectrum disorder can be addressed through interactions with horses.

General Approaches When Working with Children on the Autism Spectrum

According to the Ontario Ministry of Education, there are five categories of exceptional needs: physical, behavioural, communicational, intellectual and multiple diagnoses (Ontario Ministry of Education, 2017). Equine resources such as the *Clinical Practice of Equine-Assisted Therapy: Including Horses in Human Healthcare* by Hallberg (2018a) have documented the benefits of equine-assisted interventions in each of the following categories: equine-assisted therapy, equine-assisted psychotherapy, hippotherapy, equine-assisted activities, equine-assisted learning, therapeutic riding. Since a horse's movement closely emulates that of the natural human gait, the benefits for students with physical exceptionalities have been well documented (Hallberg, 2018a). Through this rhythmic motion, external researchers have seen an increase in gross motor skills in participants on the autism spectrum including improved balance, coordination, posture, weight-bearing ability, circulation and muscle toning (Gabriels et al, 2012; Scott, 2005). The position in which students hold onto the reins and the constant but sensitive interaction with the horse's mouth also improves fine motor skills (Ratcliffe & Sanekane, 2009).

Under the Ontario Ministry of Education's five categories of exceptionalities (physical, intellectual, communicational, behavioural and multiple) autism spectrum disorder

falls under the category of communication due to most students on the autism spectrum having difficulties with social interaction and communication skills. However as previously noted, autism is a spectrum where every student has their own unique characteristics and challenges. Therefore, when supporting children and youth on the autism spectrum in a therapeutic riding lesson, an instructor needs to get an overall assessment of the student and find appropriate strategies, some of which are provided within this manual.

The first approach to support a student on the autism spectrum is to connect with parents/guardians of the student. Parents are crucial in developing an individualized program for their child as they know their child best and will be able to give an overall description of the child's strengths and challenges, health issues, interests, sensory sensitivities, and potential stressors (Ontario Ministry of Education, 2007). Furthermore, parents can provide strategies they use which might be transferrable to riding lessons. Continuing ongoing discussions and updates with parents/guardians is crucial in making sure that the student is receiving the best opportunities and enjoyment from the therapeutic riding lessons.

After communicating with parents, the next step is to create a learning profile for the student. The learning profile can include current development skills, challenges, strengths, interests, and social language skills (Ontario Ministry of Education, 2007). Paying particular attention to any sensory challenges will provide insight into how to set up the barn and riding environment (Ontario Ministry of Education, 2007). The learning profile can be updated frequently when more observations of the student are made and will ensure that the student is reaching goals set out during therapeutic riding lessons.

As riding lessons progress it is crucial for the instructor to perform ongoing assessments to assist the student in achieving goals and fully enjoying the therapeutic riding experience. Assessments can include observations, tasks tailored to the student's needs, interviews/discussions with student/parents (Ontario Ministry of Education, 2007).

Observations should be documented through anecdotal notes that the instructor can later refer to when designing future lessons and activities. Ongoing program review will help instructors determine what is working and what needs to be changed.

Since many students on the autism spectrum are visual, sensory-based learners, setting up appropriate environmental and learning aids is crucial to ensure the student is enjoying the riding lesson and not experiencing high levels of stress. Learning aids include visual supports accompanied with verbal instructions such as pictures of tasks to be completed with the horse when grooming, mounting or steering (Ontario Ministry of Education, 2007). Some students on the autism spectrum may be non-verbal and an instructor might need to develop different approaches such as tapping the neck of the horse, in order to indicate transitions.

Lastly, in order to reduce the heightened stress of a student on the autism spectrum experiencing a new situation or task, it is important to set up a routine for every lesson. Setting up a routine allows the student to know what is coming next within the lesson and helps reduce any potential stress or systematic behaviours to arise (Ontario Ministry of Education, 2007). At WindReach Farm lessons usually follow the routine of mounting, stretching, warm-up trotting, learning tasks involving steering manoeuvres, followed by either games or trail riding, and then dismounting. Establishing a clear routine will have a positive impact on learning while reducing elements of stress.

The resource *Effective Educational Practices for Students with Autism Spectrum Disorders* by the Ontario Ministry of Education (2007) explains strategies and approaches great detail. A variety of the strategies proposed in this document are designed for an educational classroom setting but could easily be adapted to a therapeutic riding lesson. This resource provides a variety of tips for educators, insights into better understanding autism

spectrum disorder, and additional tools, techniques and resources that instructors can refer to for supporting students on the autism spectrum (Ontario Ministry of Education, 2007).

Creating a Welcoming and Safe Environment for All

Requirements of Instructors

Although therapeutic riding facilities are not regulated under the health care and education system, they still offer a service to students with exceptionalities. As a result, these facilities follow strict guidelines under the Home Care and Community Services Act (1994) as well as Section 82, Special Education of the Education Act (2017). Therefore, in order to maintain strict rules and regulations, instructors need to be certified under a governing body such as the Canadian Therapeutic Riding Association (CanTRA). CanTRA organization offers exemplary lesson structures and designs. Instructors also have to fulfil a certain amount of volunteer hours at a certified CanTRA facility, be First Aid & CPR certified, have a Rider Level 2 certification under Equine Canada to demonstrate basic riding skills, barn management and horse care skills, and take part in a year-long course that presents a certification of completion after passing a final exam (CanTRA, 2018). Facilities must also be CanTRA certified for liability purposes, have ongoing risk management assessments, high safety standards and all instructors must be CanTRA certified (CanTRA, 2018).

Standards of a Safe and Welcoming Learning Environment

The Ontario Ministry of Education (2010) document *Caring and Safe Schools in Ontario* reveals that a caring and safe learning environment is "where all students, staff, parents and community members treat each other fairly, with respect and kindness, and act in a socially responsible way towards all members" (pg. 11). The learning environment must also be "an inclusive community where diversity is affirmed within a framework of common values, and where all members participate in decision making and cooperate to promote the well-being of all" (Ontario Ministry of Education, 2010, pg. 11). All students, no matter their

race, gender and socio-economic status should not be limited from achieving their goals and aspirations (Ontario Ministry of Education, 2010). In order to achieve a caring and welcoming learning environment, instructors are required to make everyone feel safe, comfortable and accepted; create a positive and encouraging atmosphere; provide high expectations for students in regards to both their learning and behaviour; value teamwork and cooperation; and offer opportunities for students to develop stronger self-esteem and respect for themselves and others (Ontario Ministry of Education, 2010).

Rights of Participants

In addition to the standards of a safe and welcoming school, other Ontario Ministry of Education's resources such as *Caring and Safe Schools in Ontario* (2010) and *Special Education in Ontario* (2017) clearly state that students also have the right to successful and differentiated instruction alongside a learning environment that supports their unique pattern of learning and where students are inspired to meet high expectations of learning. Both of these resource documents follow guidelines presented under the Education Act that "ensure appropriate special education programs and services are provided for exceptional pupils in accordance with the Act and the regulations" (Ontario Ministry of Education, 2017, p. A2).

By providing a community service to students with exceptionalities, all riding facilities and instructors must also follow the *Home Care and Community Services Act* (1994). Under this act, all participants and their families involved in a community service have: the right to be treated in a courteous and respectful manner, their individuality and needs recognized, and have any concerns or questions about service answered respectfully. Additionally, the participants and their families should be able to assess the plan of service by the provider and to be informed of laws, rules and policies affecting the operation of the service (Ontario Ministry, 1994).

Animal Advocacy

Since Equine-Assisted Interventions are essentially appropriating horses for human benefit, the horse's welfare must always be respected. Providers of equine-assisted interventions have an ethical responsibility to all horses being used for riding sessions and each horse must be provided the Five Freedoms (Hallberg, 2018a). The Five Freedoms include:

1) freedom from hunger or thirst
2) freedom from discomfort
3) freedom from pain, injury or disease
4) freedom to express normal behaviour
5) freedom from fear and distress

(Hallberg, 2018a, pg. 175).

While some studies have shown that the horses seem to enjoy the work and have not shown any indication of stress during the session (Hallberg, 2018a; McKinney et al, 2015; Johnson et al, 2017), instructors and facilitators must be able to recognize emotional and physical stress in horses. Additionally, instructors should educate participants in recognizing signs of equine stress as this will help develop respect and empathy for the horse. Hallberg (2018a & b) provides a list of criteria in assessing stress in horses. Some of these include: moderating temperature, increased pulse and respiration; worsening of the horse's body condition; swelling on the horse's body; demonstrating aggressive and/or withdrawn behaviour; sensitivity to different types of footing, etc. Hallberg, in her text *The Equine-Assisted Therapy Workbook (2018a)* also provides detailed observation techniques that facilitators of the learning session can use in order to get the participant to better understand horse behaviour. In her book, *Humane Livestock Handling* (2008), Temple Grandin provides specific detail of stress behaviour and how it is presented in horses.

Humans also have a history of wanting to *anthropomorphize* equine behaviour in which "human place values, judgements and human constraints onto the horse" (Hallberg, 2018a, pg. 193). In order to recognize how their judgements can negatively impact the horse, participants must learn humane education skills by the instructor through a variety of scenarios. Humane education encourages the practice of valuing all living things and "not only the desire and capacity to live with compassion, integrity and wisdom, but as a process, it also provides the knowledge and tools to put our values into action in meaningful and far-reaching ways" (Pederson, 2010, p. 69). The instructor can provide opportunities for humane education by creating activities where the participant learns how to care for an animal in a respectful manner and observes the animal in their natural environment (Pederson, 2010). When using humane education in regards to horses, instructors and participants must work under four key elements. These are:

1) Relationship – Does the horse feel comfortable around the instructor and participant?
2) Understanding – The instructor and participant invite the horse to ask questions through non-verbal cues. In return, the instructor and participant provide respectful direction.
3) Communication – Participant must modify their behaviour in order to communicate with the horse. The participant must learn the language of the horse through non-verbal cues. These cues are usually associated with body language as opposed to sounds.
4) Trust – The most difficult of the four tasks. By learning certain techniques that avoid any fast movements, force, or being trapped/ cornered, the participant can slowly learn to build the trust of the horse. When an animal begins to trust their handler, fear and stress are diminished

(Grandin, 2008; Trotter, 2012).

How to use the Curriculum Guide

Stuart Shanker's Five Domains of Self-Regulation

The structure of the curriculum manual follows the theoretical model of self-regulation developed by Dr. Stuart Shanker. As defined by Shanker, self-regulation is how a person responds to stress and includes understanding the "underlying state of energy and tension when a stressor is encountered" (MEHRIT Centre, 2020, para.1). Students with special needs can have difficulties coping with high amounts of stress as well as processing and making meaning of multisensory stimuli (Shanker, 2013). Furthermore, Temple Grandin (2011) states that students with ASD can be hypersensitive to different stimuli. In his text *Calm, Alert and Learning: Classroom Strategies for Self-Regulation*, Stuart Shanker (2013) provides a variety of teaching strategies that educators can use to in order to support students with self-regulatory difficulties or with specialized needs.

Shanker (2013) separates the stressors into five specific domains, each with their own unique characteristics as well as teaching strategies for the educator to use to support the individualized needs of students. The five domains include: biological, emotional, cognitive, social and prosocial. The biological domain refers to how the student reacts to stimuli within the physical environment or biological processes that might cause stress which make the student unable to process the environment (Shanker, 2013). The emotional domain refers to a student's behaviour and mood when they are faced with a stressor. The cognitive domain provides insight as to how the student reacts during a sequence of tasks or problem-solving situation (Shanker, 2013). The social domain focuses on how the student is able to interact with others in an appropriate manner. The prosocial domain refers to how the student is able to express concern or empathy for another human or non-human being (Shanker, 2013).

Shanker's five domains are used as core sections of the curriculum manual since many of the teaching strategies suggested by Shanker are closely related to the instructional

strategies used by therapeutic riding instructors or experts in the field of equine-assisted interventions for children and youth on the autism spectrum. Some domains, such as the biological and cognitive, generated more activities and strategies for the therapeutic riding lessons than the others. This is due to the nature of the biological domain because it involves setting up the learning environment to prepare the students for the lessons. The cognitive domain also generated many activities and strategies because, through the use of games, students experience a myriad of learning opportunities that benefit cognition and learning. The emotional and social domains are very similar since social interactions and co-regulation both play a crucial role in a horse's emotional regulation (Buzel, 2016; Kohanov, 2001. Therefore, in order to avoid repetition of ideas and strategies, the emotional and social domains were shortened.

For each of the five domains, there is a brief description discussing the particular challenges that students on the autism spectrum may encounter in relation to that domain. Suggested learning expectations for students have also been included to assist riding instructors with their planning.

Program Structure to Achieve the Human-Horse Bond

Instructional strategies which address each of the five domains of self-regulation include three core approaches to building the human-horse bond: observation, groundwork/unmounted activities and mounted/adaptive riding activities. Observations were made of activities or prompts the instructor asked students while observing the horses in their natural environment. Observation discussions included some aspects of equine therapy but were more targeted to helping the students on the autism spectrum understand horse behaviour, to the best of their ability in order to build a greater appreciation for horses as a sentient being. By understanding horse behaviour, the student may be able to connect to the horse based on how they themselves react to stressful situations or social interactions. The

second approach of groundwork and unmounted activities helped establish a connection between the student and horse while also providing activities for each domain to support specific needs for that student. The last section of mounted activities allows the student to learn and apply various cognitive and communicational skills which support their overall wellbeing.

Section 1: The Biological Domain

The biological domain is comprised of three crucial factors: maintaining physical activity that enhances coordination and overall wellbeing, incorporating strategies to either down-regulate or up-regulate energy levels and understanding how students may become hypersensitive to environmental stimuli (Shanker, 2013). Self-regulatory challenges that students may have in the biological domain can also carry over to the other four domains: emotional, cognitive, social and prosocial (Shanker, 2013). Therefore, it is often best for educators to start incorporating strategies and activities that support self-regulatory skills in the biological domain such as physical activities that are enjoyable, management of auditory or visual stimuli in the known environment, and creating a supportive, welcoming and calming learning environment (Shanker, 2013).

Autism spectrum disorder is a neurological condition that significantly impacts a student's ability to self-regulate factors under the biological domain. Sensory and environmental stimuli can greatly increase levels of stress and anxiety for students with autism, often resulting in systematic behaviours like rocking or tantrums (Simpson & Smith Myles, 1998). Since autism is a complex and diverse diagnosis, some students might have hypersensitivities to some stimuli yet hypo sensitivities to others (Simpson & Smith Myles, 1998). It is crucial to become familiar with each student individually and to speak with parents in order to understand which environmental stimuli might heighten a particular student's anxiety.

Horses and therapeutic horseback riding can provide a variety of benefits to supporting students on the autism spectrum with self-regulatory challenges in the biological domain. The physical act of riding a horse promotes physical exercise that enhances wellbeing. Various postures and stretches while riding a horse activate proprioceptors in the body and play an important role in either up-regulating or down-regulating energy levels in

the body (Hallberg, 2018a; Shanker, 2013). The barn setting and interaction with horses provides the opportunity for students on the autism spectrum to be exposed to a multisensory environment but in a calming and enjoyable atmosphere (Hallberg, 2018a & b). Included in the next sections are a variety of strategies garnered during the observations and interactions with the horses in the therapeutic riding setting that promote self-regulatory skills under the biological domain.

Overall Learning Expectations:

Students who engage in therapeutic riding activities may be expected to develop self-regulatory skills in the biological domain through the following overall learning expectations:

- Recognize stimuli in their environment that cause tension or stress and find activities/strategies to alleviate/release that tension;
- Ability to recognize and understand physiological responses that indicate stress and tension as well as physiological responses that support a calm, relaxed state of being;
- Recognize activities that either up-regulate or down-regulate energy levels and use them for appropriate situations

Observation:

Being in the natural environment can expose students on the autism spectrum to a multisensory environment but can also provide a calming effect (Shanker, 2013). Observing horses in their natural environment can also educate students about how to interact with their environment in order to be more connected to the world around them (Hallberg, 2018b). The process of how to set-up observations to target the biological domain include:

- Set up a quiet and comfortable sitting area outdoors. The seating area should not be within the horses' personal space, but instead should be just outside the paddock where the observers (instructor and student(s) can easily see the horses but not directly interact with them (Hallberg, 2018b).
- Ensure that the space around the sitting area is absent of any clutter or distracting colours (Shanker, 2013).
- If needed, provide quiet fidget toys or disc cushions to help maintain focus in the present moment (Shanker, 2013). If providing fidget toys, ensure that the observation

area is far away from the paddock in case student decides to throw an item. This will prevent it from getting into paddock.

- For no longer than ten to fifteen minutes, have the student observe the horses in their environment.

- Ask the students about what they felt, heard, saw and smelled in their surroundings (Hallberg, 2018b). Ask students about what animals they saw, smelled, and/or heard? (these are appropriate questions to ask if the environment has animals other than simply horses).

- Ask students to observe how the horses interact with the world around them (Hallberg, 2018b). What in their environment makes them calm and relaxed? What triggers in their environment might cause them to become stressed or anxious? (Hallberg, 2018b). What activities/movements does the horse do to remain calm/relaxed (down-regulating)? What activities/movements gets the horse excited (up-regulating)?

- If possible, have the student write or draw about what they saw in their surroundings and anything that the horses did during the session (Hallberg, 2018b) which allows the student to internalize/reflect on the observation and also to remember the experience.

Unmounted Activities:

Interacting with horses can have several benefits on the biological domain; touching and grooming horses can increase oxytocin levels and provide a calming effect while also introducing the student to new textures, scents and smells (Fine, 2011). Furthermore, taking care of a horse can teach students on the autism spectrum how they also need to take care of their own physical wellbeing (sleeping, movement, feeding schedules, healthcare, hygiene). There are a variety of activities that instructors can incorporate prior to and following riding sessions to help children and youth with autism to be aware of physiological responses to stress and how the horse can help in recognizing/releasing that tension.

Full Body Scan:

An effective mindfulness activity that instructors can ask students to partake in prior to interacting with the horse or even entering the barn environment is doing a full body scan. Instruct students that when working with horses they need to be aware of how their body lets off non-verbal shifts/reactions that horses are very sensitive to (Buzel, 2016; Hallberg,

2018b). Horses interact with their herd members through non-verbal communication and being very alert to any sensitivity in energy levels of other members (Buzel, 2016). Therefore, before entering into their space, the student needs to be mindful of their own energy levels and stress responses.

- In a quiet space, ask the student to take a few minutes to scan their body for any tension.
- Student should stand, feet apart and hands softly by their side (Hallberg, 2018b).
- Ask the student to close his/her eyes and take three deep breaths (breathe in through the nose and out through the mouth.
- Invite the student to focus on their feet, wiggle their toes and how their feet are connecting to the ground underneath them (Hallberg, 2018b)
- Ask the student to move attention to their ankles, shins, calves and to knees. Ask if they are feeling any tension in these areas (Hallberg, 2018b)
- Then ask the student to move to the middle section of their body (thighs, hips, abdomen, lower back, ribs) and feel for any tension (Hallberg, 2018b).
- Proceed to shoulders, where they can roll their shoulders and stretch out, down to their arms, elbows all the way down to their fingers (Hallberg, 2018b).
- Next, ask the student to bring their focus up to their head, the neck to the jaw (move neck and open and close jaw) and cheeks, nose, eyes, forehead (Hallberg, 2018b).
- Lastly, ask the student to focus on the top of their head, to take three deep breaths and release any tension through the top of their head like a "trap door releasing into the universe" (Hallberg, 2018b, 6).
- Once they feel the tension release from the body, ask them to start being attuned to their natural environment. Ask them what they smell, hear, taste, and feel (Hallberg, 2018b). Then when ready, ask them to open their eyes and look at the environment around them and how they feel (Hallberg, 2018b).

Mindful Breathing:

Another excellent activity to help children and youth on the autism spectrum understand physiological reactions to stress is through mindful breathing with a horse. Mindful breathing with a horse can initiate what is known as affect regulation, "the ability of a person to calm down an exaggerated emotional response via somatic cues such as deep and

quiet breathing" (Buzel, 2016, p. 39). Horses, in a calm and relaxed state, breathe much slower and deeper than humans and asking a student to try and synchronize to the horse's breathing can provide a better understanding of their own physiological reactions (Buzel, 2016).

- Ask or guide the student to place his/her hand on the "horse's withers or shoulder and one hand on their chest" (Buzel, 2016, p. 39).
- Then ask the student to rest their head against the horse's neck (Buzel, 2016).
- Ask the student to try and match the breaths of the horse (looking at their flanks and inhaling/exhaling when they do so) (Buzel, 2016).
- Watch the horse's responses to see if he/she is alert/anxious (i.e. raising of the head, ears straight and alert, not relaxed and focused on student, breathing shallower, widening eyes) (Buzel, 2016). If the horse has any of these non-verbal responses, it means that the student is becoming more tense/anxious and the horse is feeding off of this response. Take this time to redirect the student, either by rhythmic strokes of the horse's chest or providing steps and modelling on how to monitor their breathing (breathe through the nose, hold for three seconds then breathe through the mouth) (Buzel, 2016; Hallberg, 2018b).

Activities for Optimal Regulation:

If possible, have the student take part in caring for, grooming and tacking up the horse for the riding lesson. It will provide an opportunity for the student to learn about the physical needs of the horse. Taking care of a horse is like taking care of themselves (needing a clean sleeping environment, healthy diet, grooming and bathing to reduce the likelihood of getting sick). Suggested activities can include helping muck out the horse's stall, filling the water bucket, preparing grain and hay for the horse when they have finished their riding lesson, grooming the horse, and preparing tack for the riding lesson. The suggested activities could be used prior to the lesson (preparing tack and getting food ready) to up-regulate the student's energy levels in preparation for physical activities or after the lessons (grooming) to help down-regulate their energy levels. Grooming a horse is an excellent method to down-regulate from a high energy/high tension as it lowers the heart and breathing rate as well as establishes a stronger bond between horse and student (Buzel, 2016).

Mounted Activities:

A good approach to overall lesson designs is that prior to teaching a concept (such as steering, transitions, circles, changing of rein, etc.) instructors should prepare the student for physical exercise through stretches as well as increase their energy levels through faster gaits (trotting). The rhythmic motion of trotting, especially when asking the student to do rising trot, engages their proprioceptors as well as the vestibular system. Engaging of these physiological responses in the body can have several benefits in either up-regulating the student's energy levels (proprioceptors) or increasing verbal communication (vestibular) (Hallberg, 2018a), both of which will help in preparing the student for being alert and engaged during any learning activities within the riding lesson.

Warm-up and Cool-down:

After the student(s) have mounted their horses, ask leaders to walk the horses in a twenty-meter circle with the instructor in the centre. The instructor will be directing the students through a series of stretches to warm up their bodies for any upcoming physical activities. Students who are capable of holding the reins should have the reins secured for this activity as they will need both arms for stretches. Depending on the developmental capabilities of the student, a sidewalker might need to support them through the stretching routine.

Stretching routine can include:

- Start with the neck; Ask the student to slowly roll the neck from side to side.

- Move to shoulders, and invite the student to roll shoulders and then push shoulders up to the ears then to soften them.

- Proceed to arms. Arm stretches can include windmills (rotating in both directions and changing size—large, slow rotations to very small, fast rotations). Next will be the elbow stretch where the student will grab their one outstretched arm with their other and press it to their chest; switch arms.

- Then to target the core, invite the student to outstretch his/her arms like they did with the windmills but to keep them completely straight. Ask the student to rotate the mid-section/ twist the body by first having the chest facing towards the centre of the circle then twisting and having the chest facing the wall of the arena (or fence if outside).

- After finishing twisting, ask the student to take the right hand and stretch as far forward to the horse's forelock, feeling the horse's mane along the way, however, ask the student to stay in the saddle while doing this to prevent him/her from getting off balance (if present, ask a sidewalker to assist if needed). Then ask the student to take the right hand and turn the upper body as much as possible towards the horse's rear, getting him/her to try and touch the dock of the horse's tail. Depending on the student's balance, the instructor can also ask the student to take the right hand and stretch down to the right foot and then take the same hand and try to touch the left foot. Repeat this stretching activity for the left hand.

- Once finished with the upper body, ask the student to take his/her feet out of the stirrups and to rotate the ankles. If the student has strong balance or the assistance of a sidewalker, ask the student to lift up the left ankle to the saddle (mimicking a quad stretch) and after a few seconds ask them to put the ankle back and to do the same for the right ankle.

- Side note: The student might not understand the difference between right and left. One good strategy is to use the inside hand (one facing towards the inside of the arena/towards the instructor) and the outside hand (hand facing towards arena wall or fence line).

Warming up – Trotting:

Proceeding the stretching routine, it is a good idea to have the student warm-up by trotting along the long sides of the arena. Depending on the developmental capabilities of the student, he/she might be learning to do more advanced trotting activities because that is the learning goal for the particular lesson. Incorporating some form of trotting proceeding stretches will up-regulate the body and energy levels in order to be in optimal regulation (fully alert and focused) for the learning portion of the lesson.

Starting with one direction (left or right rein), first, ask the leader to guide the horse down the long side (K-H or M-F on right rein/H-K or F-M on left rein). It is best to ask the leader to lead the horse through the first few trotting sequences so that the student is able to focus on form and become accustomed to the movement of the horse. If the student is able or has previously learned the rising trot, ask him/her to attempt to do rising trot since this will

increase engagement and warm-up of the student's joints and muscles. At the arena letter, either A or C, begin to invite the student to focus on form (heels down, head up, eyes forward, hands on the pommel of the saddle) and prepare for the transition of moving into a trot. At the corner, have the horse and rider transition into a trot, continue down the long side, and slow down back into a working walk at the next corner. Continue to trot along long sides a few times in one direction then change rein and proceed with trotting exercises in the other direction.

Cool Down:

After taking part in various learning activities that require a lot of energy from the student, it is a good idea to include a cool-down activity at the end of the lesson. Not only will it calm and relax the student after completing physical exercises, but it will also support the horse in muscle relaxation after any potentially strenuous exercise.

Within the arena, the leader can take hold of the horse and slowly walk around the arena for a few laps in both directions. Meanwhile, the student can be taking this time to interact with the horse such as scratching the horse's neck and talking. With the assistance of a sidewalker to hold their legs, the student can also bend over and rest their head on the horse's neck, arms draped over either side. Ask the student to close their eyes and focus on the movement of the horse, and follow the 1, 2, 3, 4 beats of their steps.

Another wonderful cool-down activity is to take the student, or class on a short trail ride following the lesson (depending on the facility and weather conditions). Even a short five to ten-minute trail ride around the premises, with the leader holding the horse and a sidewalker for safety, will provide excellent opportunities for the student to interact with the natural surroundings in a calming environment. Along the trail ride, the instructor can ask the student about what they can see, touch, smell, and hear within the environment around them.

Figure 2

Sample Lesson Plan: Biological Domain

OVERALL CURRICULUM EXPECTATIONS

Identify activities that either up-regulate or down-regulate energy levels and use them appropriately in a variety of situations

LEARNING GOALS

Are specific curriculum expectations rephrased in learner-friendly language- What will learners learn? Why this lesson?

I will learn about activities that make me excited/ready for lessons.
I will learn about activities that help calm me down after a lesson.
I will practice my upward halt to walk transitions.
I will practice my downward walk to halt transitions.

SUCCESS CRITERIA

"I can" statements that specifically outline what the learners need to do to achieve the learning goal.

I can take part in activities that get me ready for lessons.
I can take part in activities that help calm me down/are relaxing.
I can identify activities that get me excited.
I can identify activities that are calming and relaxing for me.
I can successfully ask the horse to go into walk.
I can successfully ask the horse to halt.

ASSESSMENT TASKS & TOOLS ('as/for/of' learning)

Will you check to see what learners know already? (assessment for learning, i.e. KWL/questioning)
How will you check learner understanding? (assessment as learning, i.e. self assessment/high five)
What are the key tasks, performances, activities, (assignments) in this lesson that will allow learners to best demonstrate that they have achieved the Learning Goals?
What assessment tools will be most appropriate to collect data? (eg. Rubric, anecdotal, check list, etc.)

To help up-regulate your student's energy level prior to the lesson, allow them to help in prepping the horse for the lesson as well as partake in stretching and trotting exercises before any learning component within the lesson.
To help down-regulate your student's energy level proceeding the riding lesson, take them on a trail ride with their horse companion or help groom their horse after finishing the lesson.

Anecdotal notes/ observations will be taken to observe the student's demeanour, tension, and energy levels before, during and after the lesson.

RESOURCES

List of resources that will be used to facilitate learning. Include a list for both the teacher and the learner.

Horse
Riding Tack
Team of Leader and Sidewalker
Outdoor riding trails
Arena
Pylons

ACCOMMODATIONS

Example of at least one accommodation that might be used for a learner with specific needs.

For transitions to different gaits student might need to tap shoulder to tell the horse to move on (if non-verbal).
Leader to guide horse so that student can focus on body posture during transitions.
Ask the student to do sitting trot if unable to do rising.
Work on walk to trot transitions for more able riders.

INTRODUCTION

The "HOOK", Motivator, Introduction to the Lesson
Explains the purpose of the lesson
Engages and motivates learners

Before the lesson, you can ask the student to help prepare their horse for the upcoming lesson (help get riding tack together, if capable do up the girth and put on bridle). This will help with up-regulating their energy before mounting the horse.
After grooming the horse and putting on riding tack, you can lead the rider and their horse to the arena and go through necessary steps (mounting, adjust stirrups if needed) to prepare for lesson.
Even if the rider is capable of steering the horse during learning parts of the lesson, you should have the leader walk the horse during the stretching section of the lesson. Have the leader walk the horse in a twenty-meter circle around "A". As the horse walks in a twenty-meter circle around "A", you can use this time to go through a series of stretches (head to shoulders/arms to mid-section then legs) with your student.

BODY OF LESSON

Includes a STEP by STEP process as to how the lesson will be carried out
Explain in detail, what exactly you will do and what you expect the learners to do.
Break up the lesson into clear sections and think about transitions from task to task.
Time needed to distribute and collect resources
Assessment of tasks or assignments

Proceeding stretching exercises, you can then lead the student through trotting exercises to help up-regulate their energy levels for the learning component of the lesson.
Depending on the student's riding ability, you should allow the leader and sidewalkers assist the student in first part of the trotting exercises.
At the arena letters, A or C, you should have the group (student, horse, leader and sidewalker) prepare for transitions into trot. You can use the arena letters in each corner as starting/end points as the group trots down the long sides of the arena. For example, on the right rein, you will have the group prepare for trot at C and into the corner of the arena. At the letter M, you will ask the group to trot down the long side of the arena until the get to the letter F. At the letter F, the group should begin to transition back into a working walk and at A prepare for another transition into trot along the opposite long side of the arena. You can have the group continue through this pattern until you either feel that the student, depending on their riding ability, is able to trot the horse independently or change rein and continue trotting pattern in other direction.

After you feel the student is up-regulated and prepared for the learning component, transition into the main learning concept for the lesson which will be focusing on

transitions. The main transitions that will be targeted in this lesson will be the upward transition from halt to walk and the downward transition from walk to halt.
During this time go through the process of gradual release where you will first model to the student proper riding aids for upward transition (squeeze with legs and in a peppy voice say walk on). You will also model downward transitions of walk to halt (gently pull back on reins and in a deep low voice say whoa or halt). If student has already been learning transitions in previous lessons and you are using this time to practice, you can ask the student (if verbal) to instruct you how to go through riding aids when transitioning to different gaits.
Once you have modelled to the student the proper use of riding aids, have the student practice the transitions (with the support of their leader and sidewalkers if necessary) through listening to the vocal commands "walk" or "halt" that you will say aloud. You can either stand in the centre area of the arena or also walk with the student to help provide additional support and input.
When you feel the student will be successful in completing the transitions on their own, select different points in the arena such as arena letters A, B, C, E that they have to ask their horse to transition from walk to halt. Here the student will need to go through the process of transitions on their own without verbal commands from their instructor. At each letter, you can ask the group to halt for three to five seconds before the student is to ask the horse to walk on.

After a few practices in both directions around the arena, you can then get the student to play a game of *Red Light, Green Light* to apply transitions from walk to halt and halt position to walk in a fun, engaging manner. You can ask the student to steer the horse and halt at the far end of the arena near letter "A" but have them facing their horse towards the letter "C". When you say "Green Light", the student needs to perform an upward transition with their horse into walk and keep walking until they hear "Red Light". When the student hears "Red Light" they need to perform a downward transition with their horse to halt. You can continue this process until the student and horse reach the letter "C". You should then have the student, with the assistance of their leader, turn the horse around so that they are facing towards "A". You can then have the student play another game of Red Light, Green Light until he/she reaches the letter "A".

CONCLUSION, REVIEW, WRAP UP OF LESSON

After the game is over, you can lead the group outside for a trail ride around the premises. During the trail ride you can ask the student to practice transitions of walk to halt at certain points and ask the student to observe scenery. When observing the scenery some questions you can ask the student are *What do you think is around this bend? How many horses are in this paddock? What colours do you see around the barn? Can you spot any different animals around the farm?*
You should also be constantly checking in on the student in regards to how he/she is feeling and when he/she feels relaxed.
When you feel the student is relaxed, return back to barn/arena, dismount and get the student to thank their team and horse.

REFLECTION OF LESSON

Which instructions/directions given to the student were successful in pushing their learning forward? What instructions/directions did they have difficulty following? How might you alter these instructions/directions for them to be successful for upcoming lessons?

What are some new techniques/strategies that you used during this lesson that you think could be used for this student in future lessons? What techniques/strategies used will be omitted from future lessons? What part/section of the lesson did the student enjoy the most? When was he/she engaged? When was the student not particularly excited/engaged? What resources/activities did you feel were helpful in supporting the student's learning? What resources/activities might you omit from future lessons with this student?

Section 2: The Emotional Domain

The emotional domain focuses on how students are able to monitor their emotions and demonstrate emotional resiliency when faced with difficult situations (Shanker, 2013). The emotional domain also comprises of the student's overall mental wellbeing including their self-esteem, their ability to up-regulate positive emotions and down-regulate negative ones (known as emotional regulation), the motivation in learning and desire to explore new activities (Shanker, 2013). When children are not proud of themselves or are experiencing negative emotions such as anxiety, frustration or anger, they will not be in a mindset to learn or focus (Shanker, 2013). Therefore, understanding the "emotional dimension" of their behaviour and how to support it is crucial in making learning activities engaging and beneficial to the student (Shanker, 2013, 28).

According to Temple Grandin, an adult on the autism spectrum and an expert in the field of animal-assisted interventions, some students on the autism spectrum have immature neuron development in the limbic system, the part of the brain in charge of basic emotions and the mind's response to potential danger (Buzel, 2016), which results in "abnormal emotional responses", especially with regards to sudden changes in routine (Grandin, 2010, p. 87). These abnormal emotional responses can include a major tantrum when angry, or a panic attack when feeling anxious (Grandin, 2010). In addition, students on the autism spectrum might be unable to experience more complex emotions and only understand simple emotions (fear, anger, happiness, sadness) (Grandin, 2010). But Grandin (2010) states that "people with autism are capable of forming very strong emotional bonds" particularly with animals (pg. 94).

Horses are the experts of emotional regulation. In the herd dynamics, they rely heavily on the energy output and subtle emotional cues of each other in order to survive (Buzel, 2016). Horses do not even have to make a sound in order to communicate to the rest

of their herd about potential threat since making any sort of noise could put one of the members of the herd in danger of a potential predator (Buzel, 2016). Instead, they have to be in tune with each other's emotions and how those emotions are translated into their physical, non-verbal cues (Buzel, 2016). Therefore, horses are exceptional in reading emotions in humans through non-verbal gestures (also known as affect signals). Often, horses will either project or mirror the emotions that the student is feeling though instant biofeedback, maybe not necessarily openly expressing them, but giving off cues through affect signals (Buzel, 2016; Kohanov, 2001). If the student is anxious or fearful, the horse might become more alert, widen eyes and have more shallow breathing. If the student is upset or angry, the horse might become grouchy or pushy (Buzel, 2016). Lastly, if the student is happy or excited, they might be "dealing with a playful, animated horse" (Buzel, 2016, p. 27). Even a horse giving off small cues can give huge insight into how the student is feeling and what steps to take going forward.

Generalized Approach:

One strategy to use throughout each of the three lesson components (observation, unmounted activities and mounted activities) is to ask the student three questions in order to understand how they are feeling in that moment. *What are you thinking about right now*? refers to their cognitive thinking processes. *How are you feeling right now*? refers to their emotions and what they are feeling. *Where do you feel these emotions*? refers to the somatic or body responses to those thoughts and feelings (Buzel, 2016). Asking students these questions during the lesson allows them to not only reflect on how their thoughts impact their emotions but also on how the body responds to those emotions (Buzel, 2016). Asking these questions also allows the instructor to decide what next steps need to be taken in order to reduce any stress or to include more challenging learning tasks.

Overall Learning Expectations:

Students that engage in therapeutic riding activities may be expected to develop self-regulatory skills in the emotional domain through the following overall learning expectations:

- Recognize non-verbal/affect signals in themselves and in others that indicate what emotions they are feeling (Shanker, 2013);
- Be able to reflect and monitor their own emotions based on non-verbal feedback given from the horse;
- Take part in activities with their horse companion that build responsibility and self-esteem;
- Take part in activities with their horse companion that promote/up-regulate positive emotions and emotional regulation.

Observation:

When focusing on the emotional domain, a great strategy is to ask students to select a horse in the field and ask them to state what they think the horse is feeling (if the student is verbal about their emotions) or provide images of different facial emotions they think the horse is feeling (Buzel, 2016). If the horse is not giving off non-verbal cues that actually indicate the emotion (sadness, excited, angry) students might actually be projecting the emotion they are internally feeling (Buzel, 2016). If this is the case, and the student is expressing that the horse is feeling sad or angry, it might be a good opportunity to incorporate activities such as grooming or fun mounted activities within upcoming lessons to provide the student with strategies/tasks to release any tension or negative emotions.

Noticing Non-Verbal Cues:

Depending on the developmental capabilities of the student, it is also a good strategy to teach them about non-verbal or affect cues that the horse gives off in order to demonstrate what they are feeling. If the horse is angry, he/she will swish the tail, paw the ground, arch the neck and back, pin back the ears, or try to snap at another horse

(Kohanov, 2001). If the horse is anxious, he/she might have shallow breathing, ears straight forward, eyes widen and the coat will be sweaty (also depends on temperature) (Hallberg, 2018a). A happy or playful horse might also have his/her ears alert and forward, but will try to interact with other horses or nudge them to try and play, or neigh to get their attention (Buzel, 2016). Lastly, a relaxed horse will have a relaxed tail, soft eyes and ears relaxed, possibly flopped down.

It might also be a good suggestion to talk to the student about what non-verbal cues humans give off that indicate how they are feeling. When looking at the horses are there also any non-verbal cues humans give off when feeling anxious, angry, excited that are similar to horses (Buzel, 2016)? After discussing observations of how horses show their emotions, ask the student to draw a picture/diagram showing the difference between a happy horse and an upset horse (Hallberg, 2018b). This will help them in the future when interacting with horses.

Unmounted Activities:

One great activity to help a student with challenges in the emotional domain is to incorporate the horse in external regulation, by discussing with the student that when the horse might be expressing certain emotions when the student is near them, the horse might be mirroring how the student is feeling internally (Buzel, 2016). During grooming or leading activities with the horse, get the student to pay attention to the horse's nonverbal cues, and if anxious or angry responses are being expressed by the horse, it might mean the student is feeling anxious or upset. If this occurs, ask the student the three thinking, feeling and body questions and if feeling anxious, it might be a good idea to take a moment and a few deep breaths, and even get the student to talk to the horse about why they are feeling the way they are (Buzel, 2016). Horses are not judgemental and often children feel much safer opening up to a horse than to adults (Fine, 2011; Hallberg, 2018a; Kohanov, 2001).

Another great method to help a student on the autism spectrum who might be having difficulties with regulating their emotions is getting them to be part of caring for the horse and performing tasks that they will be successful in accomplishing (Shanker, 2013). Teaching the student tasks that they can learn to perform on their own such as picking out the horse's feet, grooming their coat or combing their mane; getting the saddle and bridle together for the upcoming lesson; filling the horse's bucket with water or getting their flake of hay together after the lesson. All of these tasks will allow the student to feel that they are responsible, independent and take pride in caring for another being (Shanker, 2013). In doing so, it will increase the student's self-esteem and confidence which play a huge role within the emotional domain.

Mounted Activities:

Two major aspects with regards to supporting the emotional domain through mounted riding activities are to create a routine to every lesson with consistent discussions of upcoming transitions and to create activities that challenge the student but can be achieved through scaffolding and supportive environment.

Providing a routine for every lesson (mounting, stretches, trotting, learning component, game and cool down/trail ride) will lessen stress behaviour or outbursts as well as maintaining a commonality and consistency when coming to a therapeutic riding lesson. If for any reason the lesson routine needs to be changed, it is best to let the student know beforehand of this change (Shanker, 2013). Another good strategy is at the beginning of the lesson inform the student of what is the learning goal for that lesson (focusing on transitions between different gaits, learning to steer, learning to change directions through different manoeuvres) as they will already be prepared for what is coming up in the lesson. Also, between each section of the riding lesson, inform the student that he/she will begin another activity since the student might need certain equipment (stirrup length changes for example)

to be successful at that task. This also gives the instructor an opportunity to gauge how the student is feeling with that upcoming activity, and determine how slow he/she might need to progress through it.

The second strategy involves supporting the student's confidence and self-esteem in riding ability. Therapeutic riding provides students on the autism spectrum a wonderful opportunity to learn a new skill set that makes them feel unique and proud. Ongoing assessment of the student needs to occur to determine which developmentally appropriate activities will be easily accomplished and which activities might be particularly challenging. It is important to find that balance between activities that are engaging and easily achievable versus those which are overly challenging that could lead to emotional outbursts and stress behaviours (Shanker, 2013). If the task is very challenging yet beneficial to the student, break it down into several mini-lessons or steps over several lessons. Also, reassure the student that learning a new skill is not solely about the end product but instead the process to achieve that goal matters (Shanker, 2013). By implementing the approaches of a structured routine and achievable goals students will find the lesson an enjoyable and calming learning experience.

Figure 3

Sample Lesson Plan: Emotional Domain

OVERALL CURRICULUM EXPECTATIONS Recognize non-verbal/affect signals in themselves and in others that indicate what emotions they are feeling (Shanker, 2013)
LEARNING GOALS Are curriculum expectations rephrased in learner-friendly language- what will learners learn? Why this lesson? *I will be learning about signs a horse gives me when I am upset.* *I will be learning about signs a horse gives me when I am calm.*
SUCCESS CRITERIA "I can" statements that specifically outline what the learners need to do to achieve the learning goal. *I can identify signs that a horse is anxious.* *I can identify signs that a horse is angry.* *I can identify signs that a horse is relaxed.*
ASSESSMENT TASKS & TOOLS ('as/for/of' learning) Will you check to see what learners know already? (assessment for learning, i.e. KWL/questioning) How will you check learner understanding? (assessment as learning, i.e. self assessment/high five) What assessment tools will be most appropriate to collect data? (eg., anecdotal, check list, etc.) Assessment Task will be observation of horse behaviour when the student is preparing their horse for the lesson. Assessment tool: Checklist for how many times the student recognizes emotions in the horse based off of the horse's non-verbal gestures. Anecdotal notes detailing successful understanding or next steps needed to help understand behaviour responses in the horse.
RESOURCES List of resources that will be used to facilitate learning. Include a list for both the teacher and the learner. Observation space (table and chairs, picnic table, bench) enough space from paddock Horses (located in their paddock) Laminated images of horses in different emotional states (happy, relaxed, playful, angry)
ACCOMMODATIONS Example of at least one accommodation that might be used for a learner with specific needs. You should provide ongoing scaffolding on how to interact with a horse Also provide fidget toys or disc cushions when sitting and observing
INTRODUCTION The "HOOK", Motivator, Introduction to the Lesson Explains the purpose of the lesson Engages and motivates learners You can begin the lesson by bringing the student to the observation area. Prior to the lesson you should have various images of different emotional states in horses displayed on the observation table. When seated at the observation area, you can ask the student to look at the images and allow him/her to pick up any of images to look at. The student can select an image they really like and explain what they like most about it.

After exploring the images, you can then ask the student which images he/she thinks represents a happy horse and which one he/she thinks represents an angry horse. The student can also pick out an image of a horse that looks relaxed, playful, sad, scared, etc.

BODY OF LESSON

Includes a STEP by STEP process as to how the lesson will be carried out
Explain in detail, what exactly you will do and what you expect the learners to do.
Break up the lesson into clear sections and think about transitions from task to task.
Time needed to distribute and collect resources
Assessment of tasks or assignments

After the student has selected images of a horse to correspond with the appropriate emotion, you can both tidy up the observation area and get in a comfortable position to observe the horses in the paddock.

Once you are comfortable and have a spent a few moments watching the horses in their natural environment interacting with one another, you can then ask the student to think about which horse in the paddock they think is happy. Also have the student discuss why they know the horse is expressing those emotions (why response might depend on developmental capability of the student). After the student has responded about which one he/she thinks is happy, you can then repeat the same question for the emotions of angry, relaxed, playful, etc.

When you have gone through the various emotions, you can pack up the observation area and return to the barn to prepare for the upcoming riding lesson.

While grooming the horse, you can ask the student to observe any non-verbal responses that might indicate how they are feeling and why. Some responses from the student might include *relaxed when the he/she is grooming the horse; angry/grumpy when instructor is doing up the horse's girth*.

CONCLUSION, REVIEW, WRAP UP OF LESSON

Recap of lesson to determine that the learners understand what you have taught. Assign seatwork/homework to the learners.

There are two concluding activities that you can perform with the student in order for them to apply what they have learned during the observation activity. The first one might involve having the student pay close attention to non-verbal responses that their horse expresses during the lesson and explain why the horse might be feeling that way (*grumpy if the student is pulling too hard on the reins; excited when going into an upward gait such as trotting; relaxed when walking around the arena when warming up or cooling down*).

Another activity to demonstrate their learning from the observation activity is after lesson, invite the student to draw a picture of an angry horse and a picture of a happy, relaxed horse. The picture can either go home with the student or be placed in their learning profile.

REFLECTION OF LESSON

Which instructions/directions given to the student were successful in pushing their learning forward? Which instructions/directions did they have difficulty following? How might you alter these instructions/directions to set the student up for success in upcoming lessons?

What are some new techniques/strategies that you used during this lesson that you think could be used for this student in future lessons? What techniques/strategies used will be omitted from future lessons?

What part/section of the lesson did the student enjoy the most? When was he/she most engaged? When was the student least excited or engaged?

What resources/activities did you feel were helpful in supporting the student's learning? What resources/activities might you omit from future lessons with this student?

Section 3: The Cognitive Domain

The cognitive domain focuses on the student's executive functioning, meaning how he/she is able to process or "regulate areas such as planning, working memory, problem solving, mental flexibility and multi-tasking" (Shanker, 2013, p. 46). The cognitive domain also highlights the use of metacognition, or a student's awareness of their thinking and knowledge of learning style and strategies needed to be successful (Shanker, 2013). Another crucial element of the cognitive domain includes a person's ability to execute a task in several steps or sequences and while maintaining focus and concentration on a task (Shanker, 2013). In order to be successful in how a student processes a task or challenge, he/she may come up with their own strategies or methods in order to maintain focus and be successful in accomplishing that task (Shanker, 2013).

Students on the autism spectrum can have several unique strengths when it comes to their cognitive processing. Some of these strengths include: being visual-spatial thinkers, thinking in patterns or exceptional rote memory, and having attention to detail or knowing a variety of facts about one subject (Grandin, 2011; Simpson & Smith Mills, 1998). While there are an array of strengths that students on the autism spectrum may have in their cognitive capacity, they may also struggle with maintaining attention, shifting their attention from one topic to another, or the ability to follow a sequence of tasks or recognize that one task relates to another (Grandin, 2011; Simpson & Smith Mills, 1998). Furthermore, students on the autism spectrum may have challenges in metacognition or self-awareness of their "behaviours and thoughts and using that information to adjust thinking, feelings and behaviours" (Simpson & Smith Mills, 1998, 122). The cognitive process of being aware of one's behaviour and emotions is connected to the emotional domain and achieving optimal emotional regulation (Shanker, 2013; Simpson & Smith Mills, 1998).

Therapeutic horseback riding and interaction with horses offer a variety of opportunities to support children and youth on the autism spectrum with executive functions like planning a sequence of tasks, incorporating metacognition and self-awareness when being around horses, and incorporating enjoyable activities that require constant focus and attention. When in the presence of a 1200-pound animal, a student needs to constantly be aware of where they position themselves and how to behave around a horse (Kohanov, 2001; Strozzi, 2014). Furthermore, taking care of a horse includes a variety of tasks that need to be followed in a sequence to make sure the horse is receiving the utmost care or that everyone is safe. Lastly, learning to ride a horse requires a person to consistently be multi-tasking and reflecting on their posture and the natural riding aids given to the horse as well as directing the horse on where to go. Therapeutic riding can also include other aspects of executive functioning such as: planning riding manoeuvres and problem solving through engaging activities and games.

Overall Learning Expectations:

Students that engage in therapeutic riding activities may be expected to develop self-regulatory skills in the cognitive domain through the following overall learning expectations:

- Be able to approach and respond to a horse based on non-verbal cues the horse is expressing;
- Understands that their own behaviour/actions can have consequences or can impact those around them;
- With support/scaffolding, can follow and execute a sequence of steps in order to perform a task with little to no difficulty;
- To be able to focus and have prolonged attention when playing/participating in activities and games with their horse companion.

Observation:

Observing horses in their natural environment can provide great opportunities for students to reflect on how they should behave when they come into close proximity with a

horse. During this observational period, the instructor can begin by asking guiding questions related to the emotional and social domains in how horses display their emotions to members of their herd. The instructor should then build on these questions by also asking the student that if the horse demonstrates a certain gesture towards them, how should he/she respond? The instructor can ask students to think about how they should respond if they see the horse swishing its tail, ears pinned back or eyes wide (student may respond with give them space, make sure that they themselves are not upset or anxious, see if there is a certain space they are touching on the horse that the horse might not like, etc.) (Buzel, 2016; Lac, 2017). The instructor could also ask the same question if the horse has floppy ears, soft eyes and lowered head (can slowly enter into their space or gently stroke their nose or neck, can put on a halter to lead them into the barn or if in cross ties can start grooming/prepare for the lesson) (Buzel, 2016; Kohanov, 2001).

Role-playing and re-enacting potential scenarios would be an appropriate activity to build on the discussion about non-verbal gestures and observational strategies used in the emotional domain (Shanker, 2013; Simpson & Myles, 1998). The instructor can pretend to be the horse and the student(s) have to approach the instructor based on the non-verbal cues the instructor is demonstrating. It would provide an excellent opportunity to also teach how to approach the horse from the side rather than from behind or in front, known as the horse's blind spots.

After the discussion and role-play activities, the instructor can invite the student(s) to assist them in deciding barn rules in order to be safe when interacting with horses. Here the student has to think carefully about the ramifications of not following the rules (might cause injury to themselves, the horse or someone else, scare the horse, cause damage to the barn, etc.). When students lead and co-create the barn rules, it encourages their self-awareness of their own behaviour and the consequences for breaking any of the rules implemented

(Shanker, 2013). Lastly, by generating a physical copy of the rules together and posting it in the stables, students will feel as though influenced and contributed to the list.

Unmounted Activities:

The inclusion of small task sequences such as grooming procedures or tacking up a horse in preparation for a riding lesson can be a terrific way to exercise executive functioning. It is important to take one task, such as combing the mane or picking out a horse's hoof, and break it "into step-by-step sequences, relating parts to the whole" so that the student can "stay on task, and experience a sense of personal accomplishment" (Grandin, 2011, p. 67). Once the student has been able to complete the task effectively, the instructor can then introduce another task and follow the same procedure.

Furthermore, since children and youth on the autism spectrum can have challenges with following verbal directions, it would be highly beneficial to provide a supplementary visual chart with steps to follow and images they need to select in order to groom or tack up the horse. Written instructions accompanied by the visual images should be simple for the student to follow independently. The visual chart can be posted to an area close to the cross ties or can be placed above the brush box for easy access to the student.

Another suggestion is to laminate the images with simple written instructions and place velcro on the back. On the task table, the student can move the task from "need to complete" to "completed." A white board marker could also be used to check off the task when it has been completed. This will also help the student ensure they have completed the task and creates predictability by informing the student of what comes next. Furthermore, the instructor should always be present when the student is grooming or helping tack up the horse in order to provide scaffolding/modelled direction of how to perform the task in an appropriate manner as well to ensure the safety of the student and horse.

Mounted work:

Lev Semyonvich Vygotsky (1978), a Russian educational theorist, believed that a student's actual developmental level and learning capacity is limited when they have to complete a problem-solving task independently. However, when working collaboratively with peers or under the guidance of an adult, a student's level of potential development is greater and he/she is more capable of grasping the problem-solving task (Vygotsky, 1978). Therefore, when supporting a student in achieving a challenging task, an instructor needs to utilize scaffolding, a type of modelling process where the instructor provides a variety of teaching techniques in a supportive and collaborative manner. Additionally, the instructor needs to design a task that will be challenging for the student to complete, but with the proper supportive environment, can have a much stronger opportunity to accomplish the task successfully. Furthermore, the incorporation of the horse in the learning process can have a significant positive impact on a student's learning because the bond and emotional relationship built with the horse allows them to trust the learning process and to have a stronger sense of self (Trotter, 2012). Furthermore, "learning is retained more when students are emotionally invested and learning is maximized when it occurs within significant relationships" (Trotter, 2012, p. 6). Proceeding through tasks as a collective group (instructor, student, horse and leaders/sidewalkers) provides optimal learning experiences for the student.

Modelling Approach:

After determining a variety of tasks that are developmentally appropriate for the student and that can provide enough challenge (whether independently steering the horse or with the assistance of a leader) the instructor should then begin to plan how to model that learning task. An excellent modelling approach observed during research observations was the inclusion of the gradual release of responsibility, which many educators utilize in the regular classroom environment. Gradual release is essentially the process of "I do, We do,

You do". The instructor starts off the task by modelling or physically walking through/demonstrating how to approach the obstacle (transitions of halt, walk and trot, twenty-meter circles, changing rein through diagonal/centre line, figure eights, musical rides, obstacle courses, etc.). Once the instructor has physically demonstrated how to approach the obstacle, he/she will then guide the students through the task by walking beside them. After a few attempts of the task together and providing feedback, the instructor will then provide distance between themselves and the group (student, horse and leader/sidewalkers) and have the group attempt the task without the instructor's assistance. Depending on the capabilities of the student, the instructor might ask the leader and sidewalkers to also leave the group and join them in the centre of the arena.

The scaffolding approach used within the therapeutic riding lessons I observed was also used during group sessions. It included a similar process of the instructor physically modelling the task to the group, but the instructor would have the group in single file and would walk along with the student at the front of the line. Once that student had completed the task with the instructor's assistance, the instructor would ask the student to steer their horse to the back of the line and the second student and their horse would take up the lead. The instructor would then assist the student in line and once they completed the task the student would also be asked to go to the rear of the line. The instructor would continue this instructional method until all the students in the lesson attempted the task. This method gave the instructor the opportunity to support each student independently and provided him/her the level of individual scaffolding needed to be successful in the task. It also allowed the students in the back of the line to follow and practice the obstacle before they had the one-on-one session with the instructor. Proceeding the one-on-one conferencing with every student, the instructor would either continue with inviting every student to attempt the task independently or would apply the learning task to engaging games.

Visual Aids:

Since children and youth on the autism spectrum often struggle with following verbal instructions alone, it is important to include visual aids in the learning task to help them process the steps involved. Within therapeutic riding lessons, physical aids such as dressage letters placed along the outside of the arena, as well as pylons and trotting poles, can be effective in serving as directional markers and physically outlining paths the student has to follow. The physical markers that outline the path for the student allow him/her to visualize the task and how to approach it (pylons which mark the circumference of the twenty meter circle; poles placed a meter apart to indicate a path the student has to walk the horse through; approaching a letter along the arena wall indicates that they either have to turn their horse towards the inside of the arena or begin to transition to a different gait). Below are a variety of set-ups used by instructors to teach a specific manoeuvre that the student is easily able to visualize and complete independently.

Figure 4: Layout of a typical riding arena

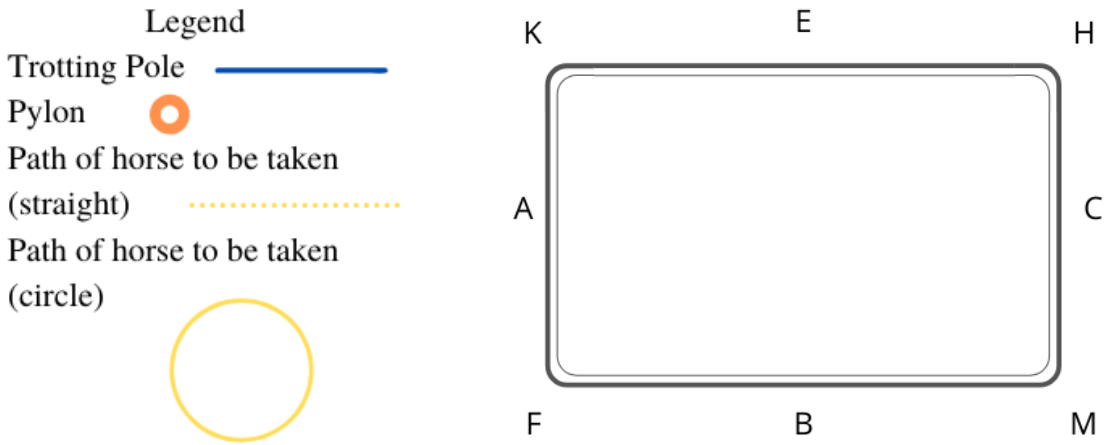


Figure 5: Physical Setup for 20 Meter Circle

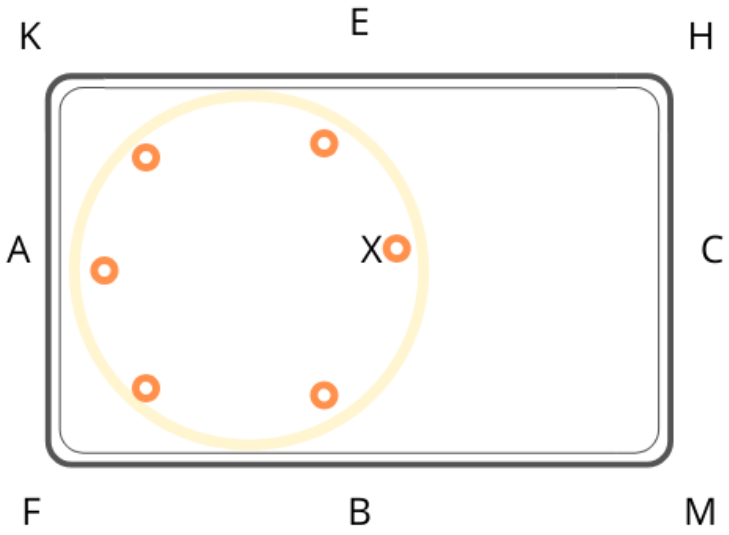


Figure 6: Physical Setup for Figure 8 Manoeuvre

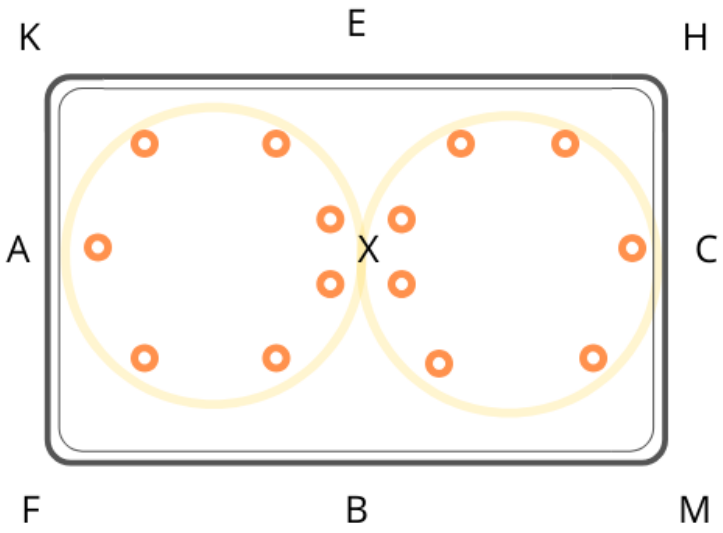


Figure 7: Physical Setup for Centre Line Directional Change

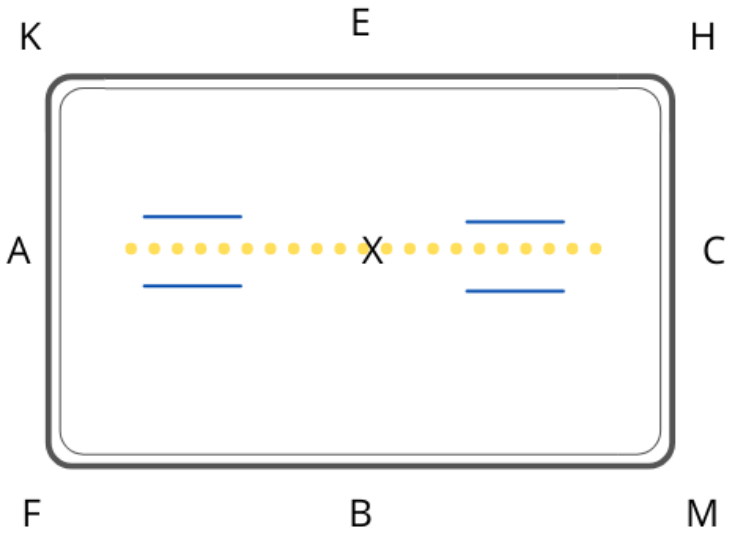


Figure 8: Physical Setup for E-B/B-E Directional Change

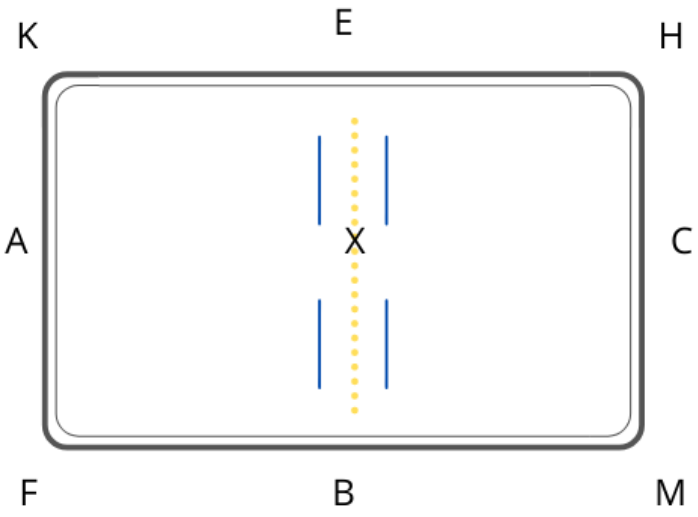


Figure 9: Physical Setup for Diagonal Change of Rein/Directional Change

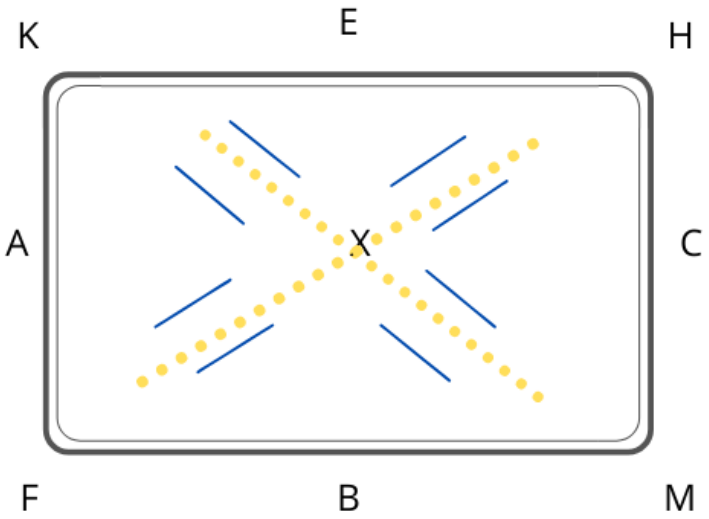
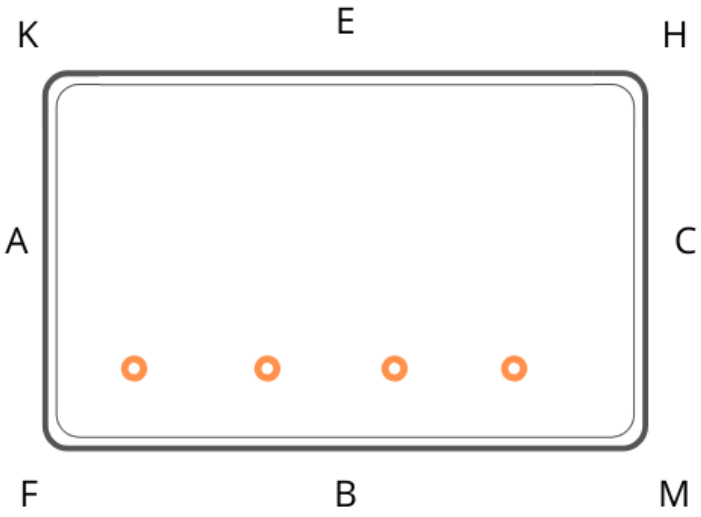


Figure 10: Physical Setup for Weaving Activity



Incorporating Games into Lessons:

The use of games proceeding a lesson can be an effective method for gaining a student's attention and maintaining it and applying concepts recently learned (Shanker, 2013). Furthermore, certain types of games such as obstacles courses, can strengthen poor motor-coordination and improve the ability to follow a sequence of tasks (Shanker, 2013). Obstacle courses can be "tailored to suit the particular needs of individual students. It is also easy to scaffold by adding steps to increase the challenge, or by introducing elements to help students work on impulse-control" (Shanker, 2013, p. 60). Suggested activities that can be incorporated into an obstacle course include: going over trotting poles, weaving through pylons, barrel racing pattern, having to turn a horse in a key, halting the horse for three seconds at a given letter, trotting from one point to another, tossing a hoop onto a pole or throwing a bean bag/ball into a bucket/net. The obstacle course does not necessarily have to include one student competing against another. It could be focused on the student trying to beat his/her own time or performing each task with little to no difficulty (Shanker, 2013).

Other games that enhance attention are: *Red Light, Green Light*, *Around the World* or *Musical Pylons*. *Red Light, Green Light* entails the instructor lining all the riders/horses at one end of the arena and inviting them to listen for either Green Light (walk forward) or Red Light (Halt). Students have to listen carefully to the instructor in order to give the horse the appropriate commands.

Around the World includes the instructor placing free-standing poles in each corner of the arena (inside of riding path). Each rider/horse is assigned to their own pole and is handed two hoops of the same colour. When the instructor says go or gives a command to go forward (plays music), the rider can drop one hoop through the pole and then proceed to walk their horse around the entire outside of the arena back to the pole they started at. When the student returns to their pole, he/she has to drop the second hoop through the pole to finish.

Whomever gets both hoops through the pole and completes an entire lap around the arena wins.

The last game that targets the student's focused attention is *Musical Pylons*. Depending on the number of riders in the lesson, the instructor will place pylons along the centre line and space them appropriately to reduce riders bumping into one another. The instructor will begin to play music and all students have to start walking around the outside of the arena. When the instructor stops the music, the student has to direct the horse to the pylon within closest proximity. Instead of taking away pylons, when a rider is unable to obtain a free one before anyone else, the instructor will just take count of who was able to arrive at the pylon first. In order to ensure the horses are not interacting or bumping into one another, the instructor should speak with leaders/sidewalkers beforehand so that they stop the horse if needed before two students/horses come close to one another.

If possible, an instructor could also take the student out for a trail ride at the end of the lesson and play games such as *I Spy* and *Simon Says*. *I Spy* and *Simon Say*s can be effective activities which enhance attention while adding a calming and down-regulating end to the lesson (Shanker, 2013). When playing *I Spy*, the instructor can ask a variety of questions that help a student engage with, observe and process elements of their surroundings. *I Spy* can help develop a student's understanding of colours, numbers, and shapes. Playing *Simon Says* at the end of the lesson can be an enjoyable activity that still incorporates careful listening, impulse control, observation and emotional regulation (having to stay calm when engaged in manoeuvres while on top of the horse) (Shanker, 2013).

Figure 11

Sample Lesson Plan: Cognitive Domain

OVERALL CURRICULUM EXPECTATIONS With support/scaffolding, can follow and execute a sequence of steps in order to perform a task with little to no difficulty
LEARNING GOALS Are specific curriculum expectations rephrased in learner-friendly language- what will learners learn? Why this lesson? *I will learn to complete several small tasks in a sequence.*
SUCCESS CRITERIA "I can" statements that specifically outline what the learners need to do to achieve the learning goal. *I can complete two to three tasks in a row.* *I can steer my horse through a task.* *I can maintain proper riding position while completing a riding task.*
ASSESSMENT TASKS & TOOLS ('as/for/of' learning) Will you check to see what learners know already? (assessment for learning, i.e. KWL/questioning) How will you check learner understanding? (assessment as learning, i.e. self assessment/high five) What are the key tasks, performances, activities, (assignments) in this lesson that will allow learners to best demonstrate that they have achieved the Learning Goals? What assessment tools will be most appropriate to collect data? (eg. Rubric, anecdotal, check list, etc.) Self-Assessment Task Chart for student to monitor their completion of grooming tasks. Anecdotal notes to observe student's overall concentration and demeanour when taking part in riding tasks.
RESOURCES List of resources that will be used to facilitate learning. Include a list for both the teacher and the learner. Horse Riding tack Sidewalkers and leaders Pylons, hoops and standing poles, bean bag and bucket.
ACCOMMODATIONS Example of at least one accommodation that might be used for a learner with specific needs. You can provide various images displaying grooming items and how to use them properly as well as a task chart to help keep track of steps in grooming process. Throughout the lesson you should be providing different forms of scaffolding to support the student when approaching each task. Depending on the student's riding abilities, you can also increase the number of tasks if the student is successful.

INTRODUCTION

The "HOOK", Motivator, Introduction to the Lesson
Explains the purpose of the lesson
Engages and motivates learners

Prior to lesson you can help reinforce the learning goal by allowing the student to help in preparing the horse for the lesson. You can begin the grooming sessions by getting the student to take part in one task such as the curry comb or combing the mane. You should model how to perform this task successfully and allow the student to attempt it independently. If necessary, you may need to take this task and break it down into smaller steps. You should also have the student talk through (if capable) what he/she is doing while performing the task. If the student is able to complete the first tasks successfully, you can then ask student to go to the self-assessment task chart, check off which task has been completed, and attempt the next step.

BODY OF LESSON

Includes a STEP by STEP process as to how the lesson will be carried out
Explain in detail, what exactly you will do and what you expect the learners to do.
Break up the lesson into clear sections and think about transitions from task to task.
Time needed to distribute and collect resources
Assessment of tasks or assignments

After bringing student and horse to the arena and the mounting and riding equipment is secure, you will then proceed to the stretching exercises. If possible, you can ask student to walk through stretching routine with you. After stretching, you should then have the student and their team perform the regular trotting activity to warm up his/her body for the learning component.

After the trotting exercises, you will then introduce the student to the steering activity through weaving pylons. There will be four pylons spaced two meters inside of the outer arena track (quarter mark). Pylons should have a few meters spaced between them for steering room. (Recommendation of placing one inside of F, one a little right of B, one a little left of B and last one inside of M).

In order for the student to be successful at steering through the weaving poles, it is recommended that you go through the process of gradual release in modelling how to approach and steer through the weaving pylons. You can do this by asking the student and their horse to halt at the beginning of the weaving pole pattern and you will then walk through the weaving pylons on your own, giving necessary instruction where needed. After providing the demonstration you will then walk beside the student and the horse, providing feedback to the student as needed. After a few attempts, you will then ask the student to practice weaving independently (depending on their ability).

For the student to continue to apply his/her learning transitions from previous lessons, and further practice his/her steering, you will need to set up an obstacle course as the game activity for this lesson. The obstacle course can consist of various activities that are of personal preference, but one suggested course can contain weaving pylons (already set up for learning component), two standing poles located on opposite length of the arena (one could be spaced just inside of "H" and another spaced at "K"). At "A" you will position a basket (sidewalkers will hand two beanbags to the student to toss in). You will need to model the obstacle course by walking through weaving pylons (line from F-M) over to H where hoops will be handed to the student and have to toss one onto standing pole at H. You will then proceed to walk down to K where next standing pole will be located. Toss hoop onto that standing pole. You will continue to walk over to basket at "A", and throw two beanbags into basket.

After modelling the obstacle, you will then walk with student and their horse through the obstacles course, providing feedback where necessary. After walking through course together, the student will attempt the obstacle course independently or at least with the assistance of a sidewalker. Depending on the riding ability of the student, you could also ask the student to attempt weaving through the pylons completely independently and the sidewalker can wait at H to give hoops and assist.
It is recommended that you have the student attempt the obstacle course at least twice to see if he/she made any improvements from one attempt to the next.

CONCLUSION, REVIEW, WRAP UP OF LESSON

Recap of lesson to determine that the learners understand what you have taught. Assign seatwork/homework to the learners.

After completing the obstacle course, you can conclude the lesson by going for a trail ride and playing "I Spy" with the student while riding around the premises.

When finished the riding lesson, you and the student will return back to arena, dismount and have the student thank their team and horse.

REFLECTION OF LESSON

Which instructions/directions given to the student were successful in pushing their learning forward? What instructions/directions did they have difficulty following? How might you alter these instructions/directions for the student to meet success in upcoming lessons?
What are some new techniques/strategies you used during this lesson that could be used for this student in future lessons? What techniques/strategies used will be omitted from future lessons?
What part/section of the lesson did the student enjoy the most? When was he/she most engaged? When was the student least excited or engaged?
What resources/activities were helpful in supporting the student's learning? What resources/activities will you omit from future lessons with this student?

Section 4: The Social Domain

The social domain explores how students are able or unable to recognize certain social stressors and whether or not they understand the type of impact their own behaviour or decisions may have on those around them (Shanker, 2017 & 2013). In order to better support a student in the social domain, an educator needs to incorporate activities and strategies that help develop their social skills. There are three types of social skills (emotional, mind reading/theory of mind, communication) that help a student in better recognize social stressors and have a stronger understanding of how their behaviour can impact those around them (Shanker, 2013). Emotional skills include: "knowing which emotions are considered appropriate in certain situations, modulating emotional responses, and understanding more complex human emotions, such as trust, envy and resentment" (Shanker, 2013, p. 75). Mind-reading skills, also known as Theory of Mind, focuses on a person's ability to recognize how those around them are their own individual, have their own thoughts and how one's actions can impact another person (Grandin, 2011; Shanker, 2013). Lastly, communication skills refer to the socially appropriate rules and behaviours that a student should follow when interacting with others (taking turns, the context of the situation, and implications of behaviour) (Shanker, 2013).

The social domain further explores the process of co-regulation where "two students observe and understand each other and adjust their behaviour to help each other reach optimal levels of regulation" or when two "individuals are socially in sync with each other" (Shanker, 2013, p. 76). All of these essential skills help students develop strong relationships with their family, friends and peers.

Most students diagnosed with autism spectrum disorder struggle with some form of social functioning. Students who have high functioning autism typically have difficulties with social conventions and non-verbal gestures (Grandin, 2011). Students on the severe end of

the autism spectrum usually have challenges in all social functioning skills (Grandin, 2011; Simpson & Smith Myles, 1998). Difficulties in social functioning include: an inability to make eye contact, limited understanding of body language, challenges with following a conversation or comprehending what the other person is saying, etc. (Grandin, 2011). Furthermore, some students on the autism spectrum are non-verbal or do not have a wide vocabulary. Temple Grandin (2011), an adult on the autism spectrum and an expert on animal-assisted interventions states that in order for students on the autism spectrum to be successful in understanding and applying social functioning skills, they need to be taught these skills through a slow process and apply them to a variety of settings.

Therapeutic riding is a socially rich environment and relies on the collaborative group dynamic of the instructor, horse, leader, and sidewalker to support the student in the learning process. Riding requires the use of natural aids, voice being one to alert the horse of upcoming transitions. On the ground, interacting with horses can also teach a student respect for one's personal boundaries and how horses have their own personalities (Buzel, 2016). When working with horses, a student also has to be constantly in tune with the horse's energy and non-verbal responses, therefore requiring the student to give complete attention to the horse's cues and finding appropriate methods to respond to them (Buzel, 2016; Kohanov, 2001; Strozzi, 2014).

Overall Learning Expectations:

Students that engage in therapeutic riding activities may be expected to develop self-regulatory skills in the social domain through the following overall learning expectations:

- Able to use non-verbal cues in order to determine whether or not they can enter another being's personal space;
- Able to recognize and understand non-verbal modes of communication in horses;
- Use an appropriate tone of voice for the context of the situation (peppy voice for upward transitions and exciting situations, and low, deep voice for downward transitions and calming situations);

- Use verbal commands along with other riding aids to demonstrate their intentions to the horse.

Observation:

Following sessions discussing how horses express their emotions to each other, the instructor should also invite students to observe how horses communicate with one another through non-verbal communication. The instructor should invite the student to observe how horses ask one another horse for permission before entering into one's personal space. When one horse has respect for another, he/she will approach slowly and watch for cues being given from the other horse before closing in (Kohanov, 2001). Also, the horse that is wanting to enter into another herd member's space would signal with eyes and ears, in an alert and focused manner, that they want to approach (Kohanov, 2001). However, sometimes horses who are young and immature will not listen to these cues and will enter into the other horse's space without permission (Kohanov, 2001). When the horse's space is being invaded it will demonstrate angry non-verbal emotional cues (Kohanov, 2001). An effective observational activity is to invite students to watch for cues being demonstrated by the horse that indicate the other horse can approach them. These typically include a relaxed demeanour with floppy ears, tail not swishing, and soft eyes.

In summary, the alertness and attentiveness demonstrated by the horse approaching indicate the respect being expressed for the other horse and their way of asking for permission to approach. The horse knows if it enters into the other horse's space without permission, it could have negative consequences.

Proceeding this interaction between the two horses it is advisable to have students discuss how they could use some of these interactions when approaching another person. For example, when approaching a person, students need to watch for cues on how close they can come into another person's space. Students also need to be attentive to when another person

is speaking by maintaining eye contact and showing alertness through their own facial expression.

An effective activity to follow would be to incorporate the role-play activity described in the cognitive domain section. Students could be asked to stop and think about where they should space themselves from the person based on the cues given by the instructor. They can observe that some people give off non-verbal cues and that it is okay to come close into their personal space whereas others do not like people very close to them (Kohanov, 2001).

Unmounted Activities:

One important way to build strong social relationships for students is to have them partnered with one horse during their entire riding program. The consistent interaction between the student and horse helps them build a repertoire with one another. Additionally, this helps the horse feel comfortable with students and it is an opportunity for them to learn the personality of their horse companion. This partnering would also mimic similar relationships in herd dynamics in that while there might be several horses in one herd, a horse usually has only one particular horse they share a close bond with (Buzel, 2016; Kohanov, 2001; Strozzi, 2014). Often this pair will be partners for life within the herd and will be in sync with each other's personality and demeanour (Buzel, 2016; Kohanov, 2001; Strozzi, 2014).

An activity to help students become attuned with the demeanour and personality of their horse companion is to get them to create a profile of their horse. It can be an art activity where they draw their horse companion or are given a basic black and white template of a horse that they colour in. Throughout various interactions with their horse, students can write down or ask their instructor to write down traits about their horse that they notice. Taking part in this task can be a great opportunity for students to get to know another being, their traits, and intentions.

Approach and Retreat:

To practice boundaries and building respect for a student's horse companion, the instructor can lead the student into the horse's paddock or stall. The student is to quietly walk towards the horse with arms extended and palms out, letting the horse know that he/she is wanting to touch the horse (Buzel, 2016). The instructor and student will be mindful of signals that the horse gives off indicating that they can either enter the horse's space or should approach respectfully in small increments. The instructor will then let the human participant touch the horse's nose and subsequently walk back, releasing the pressure (Buzel, 2016). By releasing the pressure, it is like asking the horse if the student can enter their space and show that they are not threatening (Buzel, 2016). With the guidance of the instructor, they will continue this process until the horse feels comfortable and will begin to walk forward toward the student. The process allows for both the student to learn to respect the space of the horse, gaining the trust of the horse and welcoming them into the horse's sharing space (Buzel, 2016; Lac, 2017).

Participating in this activity allows the student to practice with their horse companion the importance of walking into the horse's space with respect in a calming but alert demeanour (Buzel, 2016). By always inviting the student to practice the approach and retreat activity whenever asked to retrieve their horse in the horse's space (stall or paddock), it will also make this process an expectation whenever interacting with any living being.

Mounted Activities:

Therapeutic riding is a collaborative and social environment that has been proven to increase expressive language and social functioning (Al-Hmouz & Arabiat, 2015; Bass, Duchowny & Llabre, 2009; Gabriels, 2012; Ward, Whalon, Rusnak, Wendall & Paschall, 2013). Riding horses requires the student to use natural riding aids, including leg pressure, hands for steering, seat weight to apply pressure to slow down or speed up and voice to add

additional cues to change transitions. When the instructor teaches a student to transition to an upwards gait, they will ask a student to increase leg pressure and say “walk on” or “trot” in a peppy, expressive voice. To transition into a downward gait, the student is to apply gentle pressure with the reins and in a deep low voice say “whoa” or “halt”. Through teaching these natural riding aids, the student is also able to learn which verbal cues should be used for each situation, which is vital in developing social intelligence.

An interesting technique observed during the visits to Windreach Farm involved teaching a non-verbal student to tap the horse’s shoulder to get the horse to move onwards. While the student may not be able to express verbal commands to the horse, this strategy still allows them to express their requests in an appropriate, calm manner.

Importance of leaders and sidewalkers:

Leaders and sidewalkers are essential in not only maintaining safety and supporting the instructor in the learning process, but they also play a key role in promoting social interactions with the student. The leaders and sidewalkers can support the student in relaying or repeating information/instructors by the instructor and can give instant, positive feedback to the student. During mounting, warm-up walks and trail rides, the leaders and sidewalkers can also interact and talk with students about their personal lives, therefore practicing communication skills.

Games that insight vocabulary:

Games that allow students to describe or instruct where they need to direct their horse benefits the cognitive domain and also helps in developing social intelligence and vocabulary skills. One game observed during the Windreach visits is called *Zoo Escape.* All of the dressage letters around the arena (A, K, E, H, C, M, B, F) were stuffed animals whose names began with that letter (Elephant for E; Bear for B; Kangaroo for K, etc.). The instructor gave the students and their team leader and sidewalker one to two cards with an image of the

animal they had to bring back to the zoo (a bucket located at the centre of the arena or X). The students then had to tell their leader and sidewalker which letter they have to direct their horse toward in order to find the escaped animal. If the students did not know which letter the animal name began with, the leader and sidewalker could help with pronunciation and the phonetic sounds of that word. When the students provided the proper pronunciation of the animal's name, they then had to tell the leader to take them to that letter or if a particular student was steering the horse, they had to take the group over to that letter to pick up the animal that was shown on their card. Once they had the animal, they then had to lead/steer the horse to the bucket in the centre of the riding arena. Depending on how many cards each student was given, he/she might have to find another stuffed animal at a different letter. Incorporating games like *Zoo Escape* into the riding lesson can help students learn new vocabulary, discuss their thought processes with the leader and sidewalker, provide directions on where to go and move through a sequence of steps in order to return the stuffed animal back to the centre of the arena.

Figure 12

Sample Lesson Plan: Social Domain

OVERALL CURRICULUM EXPECTATIONS

Use an appropriate tone of voice within the context of situation (peppy voice for upward transitions and exciting situations and low, deep voice for downward transitions and calming situations);

Use verbal commands along with other riding aids to demonstrate their intentions to the horse.

LEARNING GOALS

Are specific curriculum expectations rephrased in learner-friendly language- what will learners learn? Why this lesson?

I will use verbal commands to tell my horse companion and team on what to do.
I will use my tone of voice to let my team know what transition I will perform.

SUCCESS CRITERIA

"I can" statements that specifically outline what the learners need to do to achieve the learning goal.

I can use my voice to lead my horse companion through a task.
I can use my voice to lead my team through a task.
I can use a peppy/excited voice to indicate going forward.
I can use a deep/low voice to indicate slowing down.

ASSESSMENT TASKS & TOOLS ('as/for/of' learning)

Will you check to see what learners know already? (assessment for learning, i.e. KWL/questioning)
How will you check learner understanding? (assessment as learning, i.e. self assessment/high five)
What are the key tasks, performances, activities, (assignments) in this lesson that will allow learners to best demonstrate that they have achieved the Learning Goals?
What assessment tools will be most appropriate to collect data? (eg. Rubric, anecdotal, check list, etc.)

Checklist – how many times the student was able to use voice commands to indicate his/her thought process and did he/she use voice appropriately
Anecdotal notes and observations on what the student completed successfully and what might be next steps for upcoming lessons.

RESOURCES

List of resources that will be used to facilitate learning. Include a list for both the teacher and the learner.

Horse
Team of leader and sidewalkers
Riding tack

ACCOMMODATIONS

Example of at least one accommodation that might be used for a learner with specific needs.

For students who are non-verbal you can teach them non-verbal commands/expressions such as tapping shoulder of horse to indicate upward transitions or pointing to leader and sidewalkers where to go.

INTRODUCTION

The "HOOK", Motivator, Introduction to the Lesson
Explains the purpose of the lesson
Engages and motivates learners

Prior to lesson, have the student groom the horse and discuss with you what he/she is doing. You can also talk about what they are feeling and if they are looking forward to the upcoming lesson. During grooming, you can also ask the student what tone of voice he/she should use when around horses on the ground (their response should *be a low, deep calming voice*). You can take this conversation further by asking the student why it is dangerous to use a high pitched, loud voice or scream (their response should be *because it will scare the horse or make them tense*).

BODY OF LESSON

Includes a STEP by STEP process as to how the lesson will be carried out
Explain in detail, what exactly you will do and what you expect the learners to do.
Break up the lesson into clear sections and think about transitions from task to task.
Time needed to distribute and collect resources
Assessment of tasks or assignments

The lesson should begin with routine stretches and trotting exercises. Proceeding these two activities, you will introduce the learning component of continuing to work on transitions and steering. However, the focus of this lesson will be the student using expressive voice when instructing the horse on transitions or directions.

You will again go through the process of gradual release where you will model to the student how to use proper riding aids to indicate an upward or downward transition. But for this lesson, you will focus on the natural riding aid of the student using his/her voice to tell the horse to go into an upward or downward transition. The student should have control of the reins for this activity. If the student is unable to control the horse on their own, still provide the reins to the student to hold, but have the leader apply the pressure in getting the horse to walk on or slow down to a halt. In this lesson, the main focus is getting the student to use their voice or tapping the shoulder if non-verbal.

When halting, you will demonstrate a deep low voice when saying "whoa" or "halt" accompanied with gentle pressure on the reins. As for transitioning into a walk, you will demonstrate the use of a peppy upbeat voice when saying "walk on" accompanied with a strong squeeze with the legs.

In order to practice the use of voice as a natural riding aid, you can have the student practice transitions and changing directions through the centre line pattern. Have the student work through the pattern of walking down the centre line from A, halting at X and walking onto C where he/she will change the rein to go in the opposite direction. For the first couple of attempts you should be walking alongside the student to reinforce that he/she is using voice to indicate transitions. When comfortable, you can back away from the group and have the student attempt the centre line pattern independently, making sure that they are halting on X for a short period of time before walking on to "C".

After the learning component of the lesson, you can apply the student's learning through playing a game of musical pylons (please refer to page 68 for instruction) or command class (where riders walk around outside of arena and instructor tells them a transition – halt or walk on at any time). Depending on the student's riding ability, they should have control of the reins to practice and steer, but you can also have the leader assist if needed. The focus of either of these games is to get the student to give verbal instructions to the horse with an appropriate tone of voice as they perform the transition.

CONCLUSION, REVIEW, WRAP UP OF LESSON

Recap of lesson to determine that the learners understand what you have taught. Assign seatwork/homework to the learners.

After playing either musical pylons or command class with the class, you can conclude the lesson with a cool down walk around the arena. You should get the leader to take back control of the horse while walking around the arena for a couple of laps so that the students can interact with their horse companion and talk/pet them.

After a couple of cool down laps around the arena, have the student dismount and thank team and horse.

REFLECTION OF LESSON

Which instructions/directions given to the student were successful in pushing their learning forward? Which instructions/directions did they have difficulty following? How might you alter these instructions/directions to ensure success for upcoming lessons?

What are some new techniques/strategies that you used during this lesson that could be used in future lessons? What techniques/strategies used will be omitted from future lessons?

What part/section of the lesson did the student enjoy the most? When was he/she most engaged? When was the student least excited or engaged?

What resources/activities did you feel were helpful in supporting the student's learning? What resources/activities might you omit from future lessons with this student?

Section 5: The Prosocial Domain

The prosocial domain is essentially a student's ability to demonstrate empathy, honesty and compassion toward others (Shanker, 2013) and it examines how learning and developing these positive character traits supports better social acceptance and friendship with peers (Shanker, 2013). The predominant focus of the prosocial domain is on empathy development in students and evaluates two key aspects of empathy: "the emotions that one feels and connecting the emotions to someone else" (Shanker, 2013, p. 95). There are many approaches to encouraging empathy and prosocial behaviour in students. The inclusion of animals in learning about empathy is one of the most recommended options.

Empathy has a strong reliance on social understandings related to Theory of Mind (or cognitive empathy). As stated in the section on the social domain, students on the autism spectrum can have varying challenges with understanding what others are thinking or feeling (Grandin, 2011; Simpson & Smith Myles, 1998). However, students on the autism spectrum can also have a strong desire to care and feel for another being (Simpson & Smith Myles, 1998) and have a passion for social justice and seeing real positive changes in the lives of those around them or in society in general (Grandin, 2011).

Research exploring the benefits of therapeutic horseback riding for children and youth on the autism spectrum indicate that interacting with horses increased levels of empathy within their participants (Anderson & Meints, 2016). As explored in the section under the social domain, instructors can provide various activities in mounted and unmounted activities to support students with understanding nonverbal communication that can indicate what others, horses and humans, are thinking or feeling. Instructors can also expand on other prosocial strengths that children and youth on the autism spectrum have with being given opportunities to take care of a horse and show appreciation for their horse companions.

Overall Learning Expectations:

Students that engage in therapeutic riding activities may be expected to develop self-regulatory skills in the prosocial domain through the following overall learning expectations

- Understand how horses show appreciation and compassion towards each other;
- Understand ways to show appreciation and empathy to horse companion;
- Take initiative to help care for horse companion without expectations of anything in return;
- Work together with horse companion as a collective unit and view the horse companion as a learning partner not as a tool.

Observation:

After getting students to observe how horses communicate through nonverbal gestures and how horses display respect and full attention to one another, it would also be effective to invite students to observe how horses show appreciation and compassion to one another (through mutual grooming, standing near a horse lying down to protect them from danger, being in close proximity to one another, bringing food over to another horse)(Kohanov, 2001). Depending on the developmental stage or severity of the autism diagnosis, the instructor can also ask the student to think about similar ways that humans show compassion and appreciation for one another.

Proceeding this interaction and discussion, the instructor could then ask the student to observe items in the horse's paddock or actions that horses need in order to feel cared for and appreciated. Some observations of the paddock might include a large space for the horse to run around and release energy, having another horse in the paddock to interact with, shelter for the horse to escape from the elements, food and water to survive (Hallberg, 2018b). Actions can include being groomed and having their stall cleaned every day, check-ups with the vet when the horse is sick, baths and massages, treats, etc (Hallberg, 2018b). The instructor could also ask the student how the horse would feel if people did not show those

necessary actions of care and appreciation. This could lead to a conversation about why it is important for the student to show appreciation to their horse companion and how some horses and animals are not as fortunate.

Building on this discussion, the instructor could also invite the student to list various activities discussed that they could perform to show gratitude and appreciation for this horse companion (Hallberg, 2018b). The instructor can also tell the student that when he/she has time before or after riding lessons, he/she could perform some of these actions of appreciation and figure out which one they think the horse enjoys the most (Hallberg, 2018b).

Unmounted Activities:

The best method to develop prosocial behaviour for students on the autism spectrum is to have them perform various tasks to benefit their horse companion, without expecting anything in return. Tasks students can perform include the list they developed with the instructor during the observation session. The tasks can include grooming, taking the horse out for a hand graze, getting a bath, giving them extra bedding, discovering which treats the horse enjoys eating, etc. (Hallberg, 2018b). The instructor should also have the student notice the horse's demeanour when the student performs an action of gratitude.

Mounted Activities:

During lessons instructors should be mindful of the language that they use towards the horse. The student should view the horse as their companion and learning partner, not a tool for the student's enjoyment (Lac, 2017; Trotter, 2012). Therefore, when asked to perform a task, the instructor might use both the horse's and student's names together and recognize them as a collective unit. By recognizing the pair as a team, it promotes the notion that the horse is an equal partner in the learning process and that their feelings and wellbeing should be respected.

Additionally, the instructor should find moments within the lesson to show appreciation toward the horse. After finishing a task, the instructor could ask the student to pat the horse's neck and congratulate him/her on doing it successfully or thank the student for working hard. An effective approach observed during the research visits at Windreach entailed the student turning to every volunteer and thanking them for their help at the end of each lesson. Then the student would turn to the horse and stroke his/her neck or nose, saying thank you for a great lesson. By having the student show of appreciation toward the horse, it builds upon the student's innate desire to help and care for another being and it also builds respect and appreciation for the horse.

Figure 13

Sample Lesson Plan: Prosocial Domain

OVERALL CURRICULUM EXPECTATIONS

The student / learner / student takes initiative to help care for horse companion without expectations of anything in return

LEARNING GOALS

Are specific curriculum expectations rephrased in learner-friendly language- what will learners learn? Why this lesson?

I will plan and perform a task for my horse companion to show my appreciation.

SUCCESS CRITERIA

"I can" statements that specifically outline what the learners need to do to achieve the learning goal.

I can plan a task to show appreciation to my horse companion.
I can perform a task that shows appreciation to my horse companion.

ASSESSMENT TASKS & TOOLS ('as/for/of' learning)

Will you check to see what learners know already? (assessment for learning, i.e. KWL/questioning)
How will you check learner understanding? (assessment as learning, i.e. self assessment/high five)
What are the key tasks, performances, activities, (assignments) in this lesson that will allow learners to best demonstrate that they have achieved the Learning Goals?
What assessment tools will be most appropriate to collect data? (eg., anecdotal, check list, etc.)

Assessment Task: Task designed to show appreciation to horse companion, such as….??

Anecdotal notes will be used to observe if student needs a human to give them positive feedback or does the horse's demeanour/appreciation suffice.

RESOURCES

List of resources that will be used to facilitate learning. Include a list for both the teacher and the learner.

Brush box, halter, wash stall and bathing kit, treats
Horse companion
Paper and markers

ACCOMMODATIONS

Example of at least one accommodation that might be used for a learner with specific needs.

Depending on the student's ability level, you should design activities that they will be successful at accomplishing independently such as getting a treat bag together.

INTRODUCTION

The "HOOK", Motivator, Introduction to the Lesson
Explains the purpose of the lesson
Engages and motivates learners

You should begin the lesson by reviewing how horses show appreciation to one another (mutual grooming, standing near a horse lying down to protect them from danger, being in close proximity to one another, bringing food over to another horse), Some suggested questions can include: *What are some ways that horses protect one another?* (standing over horse lying down). *How do horses show they are close friends?* (want to stand near

each other or will share food together). *What is the biggest display of affection and care that horses show on another?* (mutual grooming). *Why do you think mutual grooming is the biggest display of affection?* (Horses are in close proximity and it requires a lot of trust/respect).

During the previous lesson you and the student should have created a list of activities that the student can perform to show gratitude to their horse companion. You can both add to the list if desired.

BODY OF LESSON

Includes a STEP by STEP process as to how the lesson will be carried out
Explain in detail, what exactly you will do and what you expect the learners to do.
Break up the lesson into clear sections and think about transitions from task to task.
Time needed to distribute and collect resources
Assessment of tasks or assignments

Once you and the student have created a sufficient list of activities, ask the student to decide on which one they would like to perform for their horse companion. After the student has made their choice, you will then discuss with them how they will design that task and the steps they need to take to carry the action out. A good suggestion would be to write out the steps together on a white board or piece of chart paper (accompanied with pictures if possible) to help the student later on when performing the task.
Together with the student, you will gather necessary items needed to perform the task. If bathing the horse, this might include writing down a time slot when the wash stall/outside hose is free, getting soap, shampoo and conditioner for coat, mane and tail, and a scraper for rinsing off water.
If the student decides on an activity such as grooming, which is a common practice before lessons, perhaps add to the process with detangling and braiding mane and tail, putting on hoof polish, etc. It could also include giving the horse a treat at the end in the feed bowl.
Once all the items are collected, you and the student can perform the task prior to or proceeding the riding lesson (for example bathing or taking the horse for a hand graze would follow lesson as grooming and braiding mane might be a fun activity before the lesson).

CONCLUSION, REVIEW, WRAP UP OF LESSON

Recap of lesson to determine that the learners understand what you have taught. Assign seatwork/homework to the learners.

After concluding the activity designed by the student, you should discuss with them how the horse feels when we show appreciation to them for all the work they do in lessons. If possible, you can also try to connect it to *how people should show appreciation when being helped by someone else?*

REFLECTION OF LESSON

Which instructions/directions given to the student were successful in pushing their learning forward? What instructions/directions did they have difficulty following? How might you alter these instructions/directions for upcoming lessons?
What are some new techniques/strategies used during this lesson that could be used for this student in future lessons? What techniques/strategies used will be omitted from future lessons?
What part/section of the lesson did the student enjoy the most? When was he/she most engaged? When was the student least excited or engaged?

What resources/activities did you feel were helpful in supporting the student's learning? What resources/activities might you omit from future lessons with this student?

Bibliography

Al-Hmouz, H. & Arabiat A. (2015). Therapeutic Horseback Riding and Children with Autism Spectrum Disorders. *The Journal of the International Association of Special Education*, Vol. 16, 42-50.

Anderson, S., & Meints, K. (2016). Brief report: The effects of equine-assisted activities on the social functioning in children and adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 46(10), 3344-3352. Retrieved from http://ezproxy.lakeheadu.ca/login?url=https://search-proquest-com.ezproxy.lakeheadu.ca/docview/1871582854?accountid=11956

Bachi, K. (2012). Equine-facilitated psychotherapy: The gap between practice and knowledge. *Society & Animals*, *20*(4), 364–380.

Barba, B.E (1995). A critical review of research on human/companion animal relationships: 1988 through 1993. *Anthrozoos*, 8 (1), 9-20.

Bass, M. M., Duchowny, C. A., & Llabre, M. M. (2009). The effect of therapeutic horseback riding on social functioning in children with autism. *Journal of Autism and Developmental Disorders*, 39(9), 1261-1267. Retrieved from http://ezproxy.lakeheadu.ca/login?url=https://search-proquest-com.ezproxy.lakeheadu.ca/docview/61851543?accountid=11956

Beck, A.M. (1999). Companion animals and their companions: sharing a strategy for survival. *Bulletin Science, Technology & Society*, 19(4), 281-285.

Bustad, L. K. (1981). Symposium Summary. In Paper presented at *The international symposium on human-pet relationship*; Vienna, Austria.

Buzel, A. H. (2016) *Beyond words: The healing power of horses*. Bloomington, IN: Authorhouse.

Canadian Therapeutic Riding Association. (2018). *CanTRA Services: Centre Accreditation and Instruction certification*. Website. Retrieved on March, 25th, 2018 from Retrieved from https://cantra.ca/en/our-services

Canva. (2020). Collaborate and create amazing graphic design for free. Retrieved 2020, from https://www.canva.com/

Fine, A. H. (2011). *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. London, UK: Elsevier.

Gabriels, R. L., Agnew, J. A., Holt, K. D., Shoffner, A., Zhaoxing, P., Ruzzano, S., Mesibov, G. (2012). Pilot study measuring the effects of therapeutic horseback riding on school-age children and adolescents with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 6(2), 578-588. http://ezproxy.lakeheadu.ca/login?url=https://search-proquest-com.ezproxy.lakeheadu.ca/docview/1023529156?accountid=11956

Grandin, T. (2011). *The way I see it: A personal look at autism and Asperger's*. Arlington: Future Horizons Inc.

Grandin, T. (2010). *Thinking in pictures: My life with autism*. New York: Second Vintage Books.

Grandin, T. (2008). *Humane Livestock Handling*. Storey Publishing.

Green Chimneys Organization. (2020). *About Us*. Retrieved from https://www.greenchimneys.org/about-us/

Hallberg, L. (2018a). *The clinical practice of equine-assisted therapy: Including horses in human healthcare*. New York: Routledge.

Hallberg, L. (2018b). *The equine-assisted therapy workbook: A learning guide for professionals and students*. New York: Routledge.

Holm, S. (2017). The effects of therapeutic horseback riding on communication in children and adolescents with developmental disorders. *Mississippi State University*, *Proquest LLC*. Retrieved from Proquest LLC Thesis Database

Kohanov, L. (2001). *The tao of equus: A woman's journey of healing and transformation through the way of the horse*. Novato: New World Library

Lac, V. (2017). *Equine-facilitated psychotherapy and learning: The human-equine relational development (HERD) approach*. London, UK: Elsevier.

Lakehead University Department of Education. (2020). Resources for your teaching practicum. *Lakehead University*. Retrieved from https://www.lakeheadu.ca/programs/departments/education/undergraduate/about-your-teaching-practicum/tbay-teaching-practicums/resources-for-your-practicum

McCoy, K. M. (2011). *Autism from the teacher's perspective: Strategies for classroom instruction*. Denver, CO: Love Publishing Company.

MERIT Centre. (2019, June 18*). Shanker Self-Reg® - Self-Reg with Dr. Stuart Shanker*. Retrieved from https://self-reg.ca/self-reg/

Ministry of Ontario (1994). *Home Care and Community Services Act*. https://www.ontario.ca/laws/statute/94l26

Ontario Ministry of Education (2017). *Special education in Ontario kindergarten to grade 12: Policy and resource guide*. http://edu.gov.on.ca/eng/document/policy/os/onschools_2017e.pdf

Ontario Ministry of Education (2010). *Caring and safe schools in Ontario: Supporting students with special education needs through progressive discipline kindergarten to Grade 12.*

Ontario Ministry of Education (2007). *Effective Educational Practices for Students with Autism Spectrum Disorder.* http://edu.gov.on.ca/eng/document/policy/os/onschools_2017e.pdf

Pedersen, H. (2010). *Animals in schools: processes and strategies in human-animal education*. West Lafayette, Indiana: Purdue University Press.

Ratcliffe, K. T., & Sanekane, C. (2009). Equine-assisted therapies: Complementary medicine or not? *Australian Journal of Outdoor Education*, 13(2), 33-43. Retrieved from http://ezproxy.lakeheadu.ca/login?url=https://search-proquest-com.ezproxy.lakeheadu.ca/docview/1720065448?accountid=11956

Shanker, S. (2013). *Calm, alert and learning: Classroom strategies for self-regulation. Toronto*: Pearson Education.

Simpson, R. L., & Smith Myles, B. (1998). *Education children and youth with autism: Strategies for effective practice*. Austin, TX: PRO-Ed Inc.

Strozzi Mazzucchi, A. (2015). *Equine guided education: Horses healing humans healing earth*. Casari Ranch, LLC.

Trotter, K. (2012). *Harnessing the power of equine assisted counselling: Adding animal assisted therapy to your practice*. New York: Routledge.

Vincent, A & Farkas, K. L. (2017). Application of attachment theory to equine-facilitated therapy. *Society Register*, Vol 1 (1), Pp 7-22.

Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

Ward, S. C., Whalon, K., Rusnak, K., Wendell, K., & Paschall, N. (2013). The association between therapeutic horseback riding and the social communication and sensory reactions of children with autism. *Journal of Autism and Developmental Disorders*, 43(9), 2190-2198. Retrieved from

http://ezproxy.lakeheadu.ca/login?url=https://search-proquest-com.ezproxy.lakeheadu.ca/docview/1651850687?accountid=11956

Weldon, T.,D. (2017). An evaluation of human-horse interactions, children's attachment and trust. *Northcentral University School of Psychology*. Retrieved from Proquest LLC Thesis Database.

Windreach Farm Organization (2020). Equine Services. *WindReach Farm*. Retrieved from http://windreachfarm.org/programs_services/equine-services/

Windreach Farm Organization (2020). Mission and Vision. *WindReach Farm*. Retrieved from http://windreachfarm.org/about-us/vision-and-mission/

Windreach Farm Organization. (2020). Programs and services. *WindReach Farm*. Retrieved from http://windreachfarm.org/programs_services/

Appendix A: Participant Information Letter for Instructors

Participant Information Letter

Project Title: Curriculum Manual on Therapeutic Riding Interventions for Children/Youth on the Autism Spectrum
Investigators: Allyson Lowe (Student Researcher) and Dr.Sonia Mastrangelo (Supervisor) Date: Post REB Approval, Mid-June 2019

Dear Riding Instructor,

I am a graduate student from Lakehead University in Orillia. I am writing to invite you to participate in my research project *Curriculum Manual on Therapeutic Riding Interventions for Children/Youth on the Autism Spectrum*. The purpose of this research project is to:

- Connect practical experience from therapeutic riding instructors with Ontario Ministry resource documents on Autism Spectrum Disorders;
- Generate a strong foundation of teaching strategies and learning goals that utilize the benefits of the human-horse bond for students on the autism spectrum;
- Categorize teaching strategies observed within lessons that focus on specific needs of students on the autism spectrum (communication, social, behavioural, problem-solving/sequencing and self-regulation skills);
- To create a practical resource that future riding instructors can utilize when designing programs, session structure and lessons for children/youth on the autism spectrum;
- Provide a strong link to current Ontario Ministry resources that will encourage educators and school boards to participate in alternative learning environments such as WindReach farm.

The duration of my research project will be from June, 2019 to August, 2019. Your participation will involve observations of your riding lessons throughout the course of this research project and a follow-up interview discussion at the end of the observational period. The purpose of the observations is to document how, you as the instructor, design lesson activities, learning goals and assessment of student progress that are specific to the needs of an individual rider. There will also be informal discussions prior and following the lessons to gain more insight into your lesson design and assessment. There will be no video or voice recording of riding lessons and only observational field notes will be taken after completion of the lesson. I hope to assist you wherever necessary during the lesson as a leader or side walker but will only be able to participate in lesssons in where the parents/guardians have agreed to have me observe their child. The intent of this research project is not to evaluate your practice or program but rather learn from your experience and collaboratively create a resource document you would be happy to use within your own riding lessons. All field notes will not include any personally identifying information and will only focus on lesson design ideas and activities used.

Another component of my research project is your participation in one to two one-on-one interviews at the end of the observational period. Each interview will include open ended questions focusing on how you plan for and assess your lessons, your training as a riding instructor and any recommendations you would suggest in order to make a therapeutic riding program successful. For your participation in the interview, you will receive a fifty-dollar gift card of your choice and lunch will also be provided.

Your participation in my research project is voluntary and has been approved by WindReach Farm. Your participation in this research project will have no impact on your employment at WindReach Farm. All observations of lessons are intended to have low risk of discomfort for you and your riders; however, having a new member/volunteer in your lessons could cause you or your students to experience discomfort. My presence in your lessons is intended to be unobtrusive and I also hope that my assistance in the lessons will help in the flow of activities. Should you consent to be involved in this research project, you can withdraw at any time and all data collected during observations will be excluded from the project.

All information you provide during the interview is voluntary and you may decline to answer any of the questions asked. The interview is meant only to discuss your planning and instructional tools, it is not meant to discuss students, their challenges or progress. In accordance with WindReach Farm's privacy and confidentiality policy, if any discussion about particular students arises during the interviews, I will ask participants to use pseudonyms and to keep the discussion confidential within the context of the interview. All data (observations, field notes and notes from interviews) will be kept in a locked filing cabinet at the university accessible only to myself and my supervising professor, Dr. Sonia Mastrangelo. After five years from the end of the research program all data and observation notes will be deleted and/or destroyed.

Upon completion of observations and interviews, I will then categorize ideas and teaching strategies used in therapeutic riding lessons into specific needs for students on the autism spectrum as defined by the Ontario Ministry of Education resource guide *Effective Educational Practices for Students with Autism Spectrum Disorder*. Along with your practical expertise, I will also be using other therapeutic riding manuals or resources for equine-assisted interventions to help design learning goals, activities, planning and assessment strategies for each of the specific learning expectations (behaviour, communication, social, problem-solving/sequencing and self-regulation skills). As I would like this project to be a collaborative effort between myself and WindReach Farm I may ask for your participatory input or reflection of certain points throughout the writing of the curriculum manual. Again, this will be voluntary and you may decline to provide feedback at any time.

If this curriculum manual does get published, it will not include any personal identifying information about the students, instructors and staff from Windreach Farm. There is no intention to present this document to the academic community in any form of poster presentation but only to my research committee upon completion of my Masters of Education portfolio research project, which includes my supervising professor (Dr.Sonia Mastrangelo) and my second reader (Dr. Gary Pluim). I do intend however to write blog posts about my research for the Self-Regulation Institute through Trent University. I have gained the

approval from WindReach Farm to do so and have stated that no identifying information about participants, instructors and staff will be discussed in these posts. I also intend to send across drafts to WindReach Farm of the blog posts to gain permission before I submit to the Self-Reg Institute. I will make the posts availble to WindReach Farm to share with participants, riding instructors and their families. Once the curriculum manual is completed, assessed and approved by my research committee, I will inform WindReach Farm of its completion and if they wish, will provide a copy to use or share with future clients. If you wish to have a personal copy of the curriculum manual upon informing WindReach Farm of its completion, please reach out to me at my contact information below.
If you have any questions or concerns about my research project please contact (705) 816-4924 or email aelowe@lakeheadu.ca .

This research project has been approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Board at (807) 343-82-83 or by email at research@lakeheadu.ca. If you wish to participate in the research project, please complete and return the attached consent form to signify your intention to participate. Thank you for your interest in my research. I look very forward to the opportunity to learn from your expertise and about the amazing riding program at WindReach Farm.

Appendix B: Participant Consent Form

Project Title: Curriculum Manual on Therapeutic Riding interventions for Children/Youth on the Autism Spectrum
Investigator: Allyson Lowe (Student researcher) and Dr. Sonia Mastrangelo (supervisor) Date: January 20th, 2019

___ No, I do not choose to participate in the research project.
___ Yes, I agree to participate in the research project. I consent to participate from June 2019 to August 2019, to design a curriculum manual on therapeutic riding for children/youth on the autism spectrum. I acknowledge that: (please check all that apply)

Consent to the Research Project, Acknowledgement of My Role:

o I have read and under the Participant Information Letter regarding the study.
o I agree to participate in the research project as described. I understand that my participation will consist of: (a) permitting observation of my lessons at times arranged with me in advance, (b) participating in a 30-60 minutes (maximum) one-on-one interview after observational period, (c) sharing my instructional plans for riding lessons.
Consent to Field Notes Guarantee of Confidentiality:
o I give permission to the researcher to take observational field notes of my lessons and interview discussions.
o I understand that my identity will not be shared and that my students will not be identified in the curriculum manual, or any publication and presentation of the research.
Right to Withdraw:
o I understand that I can withdraw from this research project at any time prior to the end of the data collection period (August, 2019), and that I may decline to answer any question.
o I have the right to withdraw the use of any portion of the data collected (field notes, answers to interview questions, instructional lesson plans) prior to the end of data collection. Specifically, I understand that my privacy and the privacy of support staff, volunteers and students will be protected by Miss Allyson Lowe and her supervising professor, Dr. Sonia Mastrangelo. I understand that all data collected will be kept securely for a minimum of five years from the end date of the data collection period where it will then be deleted or destroyed. I also understand that I will receive a $50 dollar gift card and a free lunch on the day of the one-on-one interview for my participation. I may also request to have a copy of the curriculum manual upon its completion. I understand that I will not be penalized by either Lakehead University or WindReach Farm if I decline to participate.

Name of Participant (please print): _____

Signature of Participant: _____

Appendix C: Participant Information Letter for Parents/Guardians

Participant Information Letter

Project Title: Curriculum Manual on Therapeutic Riding interventions for Children/Youth on the Autism Spectrum
Investigators: Allyson Lowe (student researcher) Sonia Mastrangelo (supervisor) Date: Post REB Approval, Mid-June 2019

Dear Parent or Guardian,

I am a graduate student at Lakehead University, Orillia, who is conducting an REB-approved research project under the supervision of an associate professor, Dr. Sonia Mastranagel from the Faculty of Education. I will be researching practical methods on how to utilize the human-horse bond to help children and youth on the autism spectrum. With the permission of WindReach Farm, your riding instructors have been invited to participate in a research project to help in the creation of a curriculum manual that combines Ontario Ministry resources on autism and the benefits of therapeutic riding. Your child's riding instructors have agreed to be observed during their riding lessons to help facilitate the discovery of new teaching and assessment strategies. All teaching and assessment strategies will be designed to better help students with behaviour, communication, social and self-regulation skills. The information obtained from these observations will provide the foundations of a new curriculum manual to be used by future therapeutic riding instructors when designing specific learning goals for their students on the autism spectrum.

The duration of my observations will be from July-August 2019. I will be conducting one-on-one interviews with instructors in late August 2019. During this time, I will be volunteering in the riding lessons as (either) a leader and/or walker. All observations will be documented through field notes which will only highlight how the lesson is designed for the needs and learning goals of your child. Any personal identifying information about your child, such as his or her name or the name of their instructors will not appear in the publication of the curriculum manual. All field notes will be kept in a locked filing cabinet at the university and will only be accessible to myself and my research supervising professor, Dr. Sonia Mastrangelo. The field notes will be stored for a maximum of five years from the end of said timeframe, where they will then be deleted or destroyed.

The riding lessons and barn activities are intended to be an enjoyable experience and my presence is meant to be as unobtrusive as possible. However, while the observations are meant to be low risk with minimum discomfort, my presence could still cause your child to be uncomfortable or shy. My observations will only be documented after the lesson has concluded and will cause no interruptions to his or her lesson or affect the services they are being provided at WindReach Farm.

If you have any concerns about the nature of my observation, please contact your riding instructors or me at aelowe@lakeheadu.ca or (705) 816-4924. For both options of having your child observed or excluded from the research project, please fill out the form

below and return it to your riding instructor so that I can receive it. If for any reason during data collection (July to August), you no longer wish to have your child observed, please let me know and I will no longer participate in their riding lessons. Also, all previous data collected (field notes and observations) about your child's lesson will be destroyed. You will be able to withdraw your child from the research project up until the end of August, when data collection ends. Your decision to either have your child participate/not participate will have no impact on the services you receive at WindReach Farm.

The goal of this research project is to create a curriculum manual that future riding instructors can utilize in designing specific learning goals for children and youth on the autism spectrum. This work is to help assist students wanting to enter the rapidly growing and changing industry of equine assisted interventions. Furthermore, by connecting this form of animal-asssisted intervention to the Ontario curriculum, my hope is that it will encourage the wider educational community to participate in alternative learning environment such as WindReach Farm.

If this curriculum manual is to be published or presented to the academic community, it will not include any personal identifying information about the students, instructors and staff from Windreach Farm. I do intend however to write blog posts about my research for the Self-Regulation Institue through Trent University. I have gained approval from WindReach Farm to do so and have stated that no identifying information about participants, instructors and staff will be discussed in these posts. I will make the blog posts available to WindReach Farm to share with participants and their families. Furthermore, once the curriculum manual is completed, assessed and approved by my research committee, I will share a copy with WindReach Farm and will leave my contact information with them, if you wish to receive your own personal copy.

If you have any questions or concerns about this research project or your child's participation, please contact your child's riding instructor, my supervisor Dr. Sonia Mastrangelo smastran@lakeheadu.ca or me directly at aelowe@lakeheadu.ca (Allyson Lowe).

This research project has been approved by the Lakehead University Research Ethics Board. If you have any questions related to the ethics of the research project and would like to speak to someone outside of the research team, please contact Sue Wright at the Research Ethics Boards at (807) 343-8283 or by email at research@lakeheadu.ca. If you wish to have you child participate in the study, please complete and return the attached consent form to signify your intention to participate.

Thank you for your interest in my research project.

Appendix D: Informed Consent Form

Permission to Participate in Research Project:

Please only fill out this section of the form if you agree to have your child participate in the research project: *Curriculum Manual on Therapeutic Riding interventions for Children/Youth on the Autism Spectrum*

I _____, give graduate student, Allyson Lowe, permission to observe my child's riding lesson for research purposes.

Opting out of Research Project:

Please only fill out this section of form if you **do not** want your child's riding lesson to be observed for the research project: *Curriculum Manual on Therapeutic Riding interventions for Children/Youth on the Autism Spectrum*

I _____, **do not** give graduate student, Allyson

Lowe, permission to observe my child's riding lesson for research purposes.

Appendix E: Interview Questions

How did you become involved in therapeutic riding?

What qualities do you think riding instructors need to have/predisposition before becoming involved in therapeutic riding?

What are some ongoing steps you have to take to ensure the program is in top working order?

Do you find your clients respond differently to different settings? (barn, indoor arena, outdoor arena?)

What are some resources you wish can be made available to you in order to improve the riding sessions?

How do you assess the progress of riders?

How do you like to end the riding sessions?

Have you noticed any changes in self-awareness and sense of personal control in the riders/clients since they have been involved in the program?

What techniques do you use within riding sessions to help improve self-awareness and sense of personal control within riders/clients?

What techniques do you use within the riding sessions to help riders/clients communicate their thinking/commands to horse?

How do you incorporate social interactions between clients, horse and staff during riding sessions?

What do you think helps a student in building a trusting relationship with a horse and vice versa? What are some strategies that you use in order to build this bond?

Why do you think therapeutic riding should be used a form of treatment/intervention?

Appendix F: Instructor Responses from One-to-One Interviews

Question	Instructor 1	Instructor 2	Instructor 3	Instructor 4
How did you become involved in therapeutic riding?	Volunteered at stables and then became barn manager Avid rider	Always been an avid rider and regular instructor Decided to volunteer at another therapeutic riding barn and pursue becoming a therapeutic riding instructor	Daughter no longer was taking part in recreational activities and was looking for something to do Signed up as a volunteer then became an instructor Learned through a place in Hamilton for six months and they sent me down to Virginia to be PATH certified Then went straight to WindReach	N/A (Time restrictions)
What qualities do you think riding instructors need to have/predisposition before becoming involved in therapeutic riding?	Patience Flexible Outgoing Horse experience	Focused on certification Rider levels under Ontario Equestrian Federation Needs to have horse experience	Love for horses Have a understanding and ability to work with so many different exceptionalities Was introduced to different exceptionalities through daughter – but never viewed	Certification Ability to relate and deal with different situations Outgoing Adaptable – flexible Patient Mediator Good listener

			them as being disabled Look past the label and treat them equally	Calm Engaging Stickler for safety Authority – take charge in situations
What are some ongoing steps you take to keep your therapeutic riding program in top working order? (Examples: grants, finding horses, construction, equipment?)	Constantly looking out for new horses Ongoing professional practice and learning	Consistently going to clinics and taking part in ongoing professional development Every three months either instructor goes to a professional development clinic, OEF clinic or they hold a clinic at WindReach Farm for others to come and learn.	(Did not apply to this instructor)	(Did not apply to this instructor)
Do you find your students respond differently to different settings? (For example barn, indoor arena, outdoor arena, trails) **How do you utilize the environment within your lessons?**	Students definitely respond to different environments Some however love the wind and some don't	Students definitely respond to different environments Outside instructor likes to incorporate different sounds, or	Lousy weather impacts ability to go outside Kids light up when they go for a trail ride/hack Just outside connecting with nature	Some students prefer with Some love to be outside Trails do break up the lesson

		counting of things they see in paddocks or environment Questions during trail ride of things they see or hear, etc.	No training differences	
How do you determine learning goals for your students? What determines the length of riding lessons/programs a child or adolescent with autism will receive?	Instructor used example of the musical rides as being an end goal and how lessons are taught and broken down in order to being to learn the larger sequence later Also uses example of some students may not be able to even use the reins to steer but can at least be taught how to hold them	Make sure to have long term goals and a bunch of short-term goals Change goals if necessary Notes of what to do for next session in case there is a substitute teacher	Anecdotal notes of each lesson and think of next steps – use a demonstration Stay with me long enough I want to get them to be independent Long term goals See joy of tackling something difficult Have a strong enough challenge Take off lead before ready but always have support there When they focus and attention	Reading background history of student Observing student in first couple of lessons in order to find out how I can motivate and engage them Break things down – lots of repetition Go back to basic if messed For example, with the posting trot, I repeat it often and incorporate it into as many aspects as possible Make sure that the activity is not too long, shorter

			Goal of independency	duration, no grilling them over minor aspects
What are some resources you wish could be made available to you in order to improve the riding lessons?	Letters, pictures based on season Cards with pictures of directions	FUNDING! But does depend on facility and what that facility offers For example, if the facility has fields or outdoor space they should definitely utilize them	Autism lecture Assistive technology Try to incorporate life skills into the lesson More resources and training for autism Tools for directions or teaching directions Word choices/phrases Story boards – watch lessons and create story boards	N/A (Time Restraints)
How do you assess the progress of your students? How does your assessment influence upcoming learning goals?	Goals – if they do not get there then the instructor needs to go back and revaluate Parent feedback to transfer to home environment	Attempt different methods and use tools to help Example of coloured reigns to help differentiate between turning left and right	Anecdotal notes Apply riding to all riding and incorporate games to apply their learning Creating a supportive communicate and thank students that help	Take anecdotal notes for next lesson Recognize if anything in particular stands out – positives and negatives Track them over time

How do you like to conclude/end the riding lessons?	Line up and thank horse and helpers Ask questions based on what they learned in the lesson Think of two stars and a wish as well as next steps	Line up and thank horse and helpers Find some form of evidence of learning	Always conclude on a high note On good thing they did Positives	Always end on a positive note – what they did well and followed through with Line up all students and have instructor talk with them/ recap what they learned Ask questions about part of horse of tack Get them to thank everyone
What techniques/lesson/activities do you use within riding lessons to improve self-awareness and sense of personal control in your students?	Interactions with horse – get them to pat and huge horse if stressed Stop activity and take break	Use interactions with horse Rely on worker and parent in what strategies they use	Look to parents – sometimes bring parents in to help with redirection Target to keep student focused – know they will get there Make a big deal of being off the lead	Distraction techniques to get them to forget about what they are fixated on Keep moving Talking calmly – quiet voice Get the child to focus on the movement of the horse Incorporate a connection with the horse as a lot of times they do not get that one-to-one opportunity

What techniques/lesson ideas do you use to help students communicate their thinking/commands to the horse? Also what are some activities you incorporate into your lessons to foster language development in students?	Commands or taps Spelling – animals with letters game Try to use tools with different colours Focus on progression over time	Finding different commands and cues to get the horse to move on or for transitions	Animal hunt – using arena letters and give card with visual of animal Steer horse to it Grab stuffy toys Real animal – abstract thinking Real world relationships Learn a lot from leaders and sidewalkers Team effort Learning can only work with the support of a team	Move on or halt Ask student to look at ears – see if the horse is listening to their commands Paying attention to the horse Say that we cannot do certain actions because it could hurt the horse Collect all the animals game – have them say letter and what words start with it Counting poles or pylons
How do you promote social interactions amongst student, horse and staff during riding lessons?	Games Cooperation and cheering plus positive feedback Encourage talking with volunteers and discuss personal life with them	Games Talking with volunteers (sidewalkers and leaders)	Some sidewalkers have great relationships with student – utilize that a Also ask sidewalkers for support in language development (some are teachers or educators)	Like to get riders to talk to each other Games really promote social interactions and working as team to engage with others Promote side walkers and leader to talk with students – act as

				educational assistants Talking with the student personally
What do you think helps a student in building a trusting relationship with a horse and vice versa? What are some strategies that you use in order to build this bond?	Size and movement of the horse Pairing child with same horse	Time to spend with horse on the ground or through grooming Same horse over a period of time	Make sure to thank their horse face to face Stay with the horse while helping other students dismount Have a few minutes with horse If horse is done the student walks out with them and helps prepare the horse to go outside	Like to make horse and rider pair consistent Get them to help with grooming and leading Always thank and pet the horse after the lesson Tell student that the horse is listening to them and the student needs to encourage their horse through being calm
Why do you think therapeutic riding should be a form of treatment/intervention for children and youth on the autism spectrum?	calming sensory No judgement Especially for teens where they can be in a group lesson and create friends	calming Some students are at so many therapies and that this offers something unique Not sure if they would call it therapy but that there	Seen the benefits Live in a world of these things they can't do and now they have on thing they can do Control this large animal gives them confidence	Some of the students do not feel engaged with their peers and therefore are able to feel a connection to their horse It is calming Able to engage and do things they wouldn't do otherwise

		are so many sensory activities that they can incorporate	Emotional and spiritual connections Seen the transition over many years Not a clinical or hospital environment Feels normal Majority of kids likes a horse. Only had one or two that did not.	Special bond and emotional connection where the student can tell them anything Freedom and trust

Chapter 5: Sensory Riding Trail Design

Lakehead University
Masters of Education
Portfolio Route

Spring 2020

Allyson Lowe

Design of Sensory Riding Trail

The following resource provides various activities and design ideas for therapeutic riding facilities considering implementing their own sensory riding trail.

Image used with permission from Pegasus Therapeutic Riding Organization, 2020

Therapeutic horseback riding and the human-horse bond can provide a multitude of benefits for children and adults with special needs, such as reduced hyperactivity and irritability, increased motor function, hand-eye coordination, improved communication and social skills, increased attention and motivation, and improved executive functioning (Hallberg, 2018). However, some individuals with special needs might not be able to retain or participate in adaptive riding activities due to an intellectual or physical exceptionality. Some riders might also have difficulties coping with multiple sensory stimuli at one time and a sensory trail allows them to be exposed to various stimuli but in a calming, safe and supportive environment (Cambridge Riding for the Disabled, 2020). Also, instructors might wish to further explore skills that students have acquired in lessons or just simply want to have an additional feature to add to their facility which can bring joy and excitement to their students (Smith, 2013). Incorporating a sensory riding trail to any therapeutic riding facility, big or small, can provide instructors with a variety of additional fun, interactive activities, that also connect students with the natural environment.

Another avenue that can be explored through a sensory riding trail is the equine-assisted intervention of hippotherapy. Hippotherapy is a form of equine-assisted therapy which uses "manipulation of equine movement to engage sensory, neuromotor and cognitive systems to achieve functional outcomes" (Hallberg, 2018, p. 41). Hippotherapy is overseen by a medical practitioner that specializes in occupational, physical and speech therapy to help support targeted needs of a child (Hallberg, 2018). By providing both adaptive riding and hippotherapy into their practice, a therapeutic riding facility can support a variety of individuals with special needs within their community.

What is a Sensory Riding Trail?

A sensory riding trail is "a rich learning environment of woodland paths that consist of slopes, turns, varied footing, natural sights and sounds, and man-made activity stations. This integrated environment challenges the students' balance, stimulates their senses and encourages them to interact with the world around them" (Pegasus Therapeutic Riding Organization, 2020, para. 1).

Lakehead University

Masters of Education
Portfolio Route

Map of Sensory Riding Trail

The above sensory trail design is separated into various trails, each providing their own tailored activity centres. One trail might have activities and games that focus on motor functioning and coordination, while another trail might allow a child to express their artistic talents of music, art and drama, all while on horseback.

A sensory trail also provides excellent opportunities for instructors to target specific needs of their students. While one student might have cerebral palsy or spina bifida which require more muscular toning and conditioning through physical play and movement, a child on the autism spectrum might need more support in cooperative, social play that requires the use of social and communication skills.

While there are several benefits and enriching activities to be explored in greater depth throughout the resource guide, one of the more rewarding aspects of a sensory trail is that it fosters independence, allowing a child to choose which activities they enjoy and what they would like to experience (Pegasus Therapeutic Riding Trail, 2020).

When an instructor provides children or adults with special needs the opportunity to decide which activities they would enjoy most with their horse companion, it gives them the freedom of choice, promotes their own decision-making skills and creates a tailored experience (Pegasus Therapeutic Riding Trail, 2020). While a sensory riding trail is supposed to have various activities, which are explored in this resource, its main purpose is to provide an enjoyable, calming experience for the child or adult in mind (Cambridge Riding for the Disabled, 2020). Providing a physical map (prior to entering the sensory trail) or pamphlet (such as the one designed above) for the sidewalker to carry, allows the rider to select which activities he/she would like to attempt with the team and horse companion (Pegasus Therapeutic Riding Trail, 2020). By giving children the independence and freedom of choice, it allows the riders to feel like they are going on an adventure and have to learn to navigate their way through the trail.

Map of Sensory Trail was Designed by Allyson Lowe using Adobe Illustrator and Adobe Stock. Activities in design were inspired by Cambridge Riding for the Disabled, 2020; The Discover Trail, 2020; Equuvation Inc., 2020; Heavenly Gaits Therapeutic Riding Center, 2019; Maryland Therapeutic Riding, 2019; New Zealand Riding for the Disabled, 2017; Pegasus Therapeutic Riding Organization, 2020.

Steering Through Intersections

Image used with permission from Pegasus Therapeutic Riding Organization, 2020

Incorporating directional and road signage, as evident in the image on the right (which includes stop/whoa, yield, windy path, uneven terrain or deer crossing) can provide a variety of benefits to executive functioning, communication skills and fine and gross motor skills (Heavenly Gaits Therapeutic Riding Center, 2019). The rider has to: plan out the sequencing of commands to give to the horse and team in order to slow down, turn, walk forward, etc. which all require focus and be attention to where they are going at the same time (Pegasus Therapeutic Riding Organization, 2020, Smith, 2013). Furthermore, the rider is learning rules of the road such as four-way intersections and yielding, which can be transferred to everyday experiences as well as understanding consequences that may occur for not following the rules (Pegasus Therapeutic Riding Organization, 2020; Shanker, 2013; Smith, 2013). The rider also has to give the appropriate expressive voice commands to tell the horse to move forward or to slow down. Providing expressive voice commands allows the rider to understand and develop auditory discrimination (Smith, 2013). Lastly, the child is engaging various proprioceptors in their joints when either applying pressure in the arms to slow the horse down or applying pressure in the legs to ask the horse to transition upwards. In performing activities such as transitions that incorporate the proprioceptors, the rider is being prepared for upcoming activities by up-regulating their energy levels (Shanker, 2013)

Different Terrain

Different terrain such as the drawing of different textured footing can be excellent in challenging “the rider's balance and awaken the senses of motion, of being aware of how one's body moves in space” (Smith, 2013, para.4). Different textured footing can also create different sounds that engage the auditory system and exposes the rider to various types of stimulation from the horse when walking on varied surfaces (Smith, 2013).
If a facility is able to incorporate a hill or different levels of terrain it will also be beneficial to helping riders in their balance and sense of gravity, which can improve their coordination (New Zealand RDA, 2017).

Soil

Image from Akyurt, 2020

Sand

Image from Wikimedia Commons, 2005

Logs/Poles

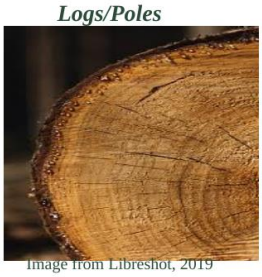


Image from Libreshot, 2019

Gravel

Image from Pikirepo, 2020

Mulch

Image from PIXNIO, 2017

Paved/Stone

Image from Pxhere, 2020

Dry Moss/Grass

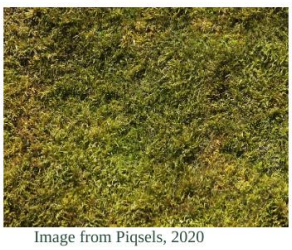


Image from Piqsels, 2020

Bridges and Planks

Image used with permission from Pegasus Therapeutic Riding Organization, 2020

Image used with permission from Pegasus Therapeutic Riding Organization, 2020

Image by Mahoney, 2020

Adding a plank for a sensory trail is another excellent way to work on a rider's balance, posture, and bilateral coordination (Pegasus Therapeutic riding Organization, 2020). The movement of the horse going up onto and off of the plank engages many different muscles in the legs, back, and core, which helps with muscle strengthening.

A bridge over a small stream or trench is another option to move from one terrain to another, as well as connecting with the natural environment (Smith, 2013). Walking on the planks of the bridge can also cause a "clip clop" sound from the horses' hooves which riders find very enjoyable and stimulating to the auditory system (New Zealand RDA, 2017). The New Zealand Riding for the Disabled Association also suggests putting different sculptures or items under the bridge near the stream or trench, so that the rider has to try and spot them as they cross over (New Zealand RDA, 2017).

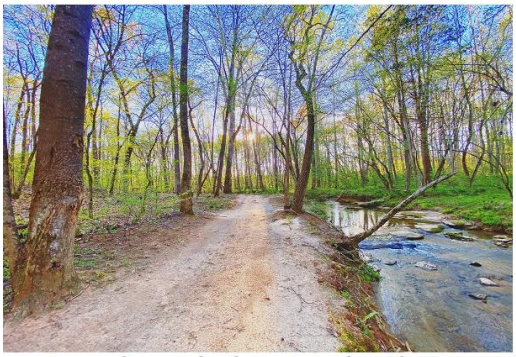
Mailboxes with Surprise Messages/Activities

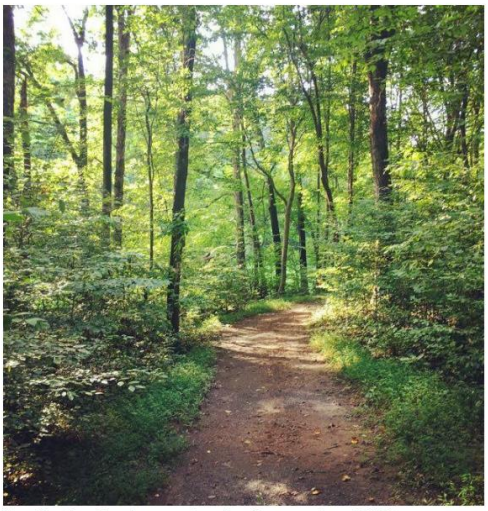
Compartment inside can store hidden messages, mini activities, toys or items with different smells or textures (Pegasus Therapeutic Riding Organization, 2020).

Image used with permission from Pegasus Therapeutic Riding Organization, 2020

Mailboxes or "Sniff Boxes" (Pegasus Therapeutic Riding Organization, 2020, para. 5) are a great way to add a surprise to any trail ride. Inside the mailbox can be a variety of activities such as small games, a list of a scavenger hunt they have to complete, toys, and different objects that might have a smell, texture of taste (Smith, 2013). Mailboxes could also allow the rider to work on communication skills by placing a message inside that the rider has to read aloud to the group and horse companion (with support of the team if needed). The mailbox activity gets the rider to interact with a variety of tactile objects and helps them get excited or up-regulated for other activities during the sensory trail ride (Smith, 2013).

Quiet Trail

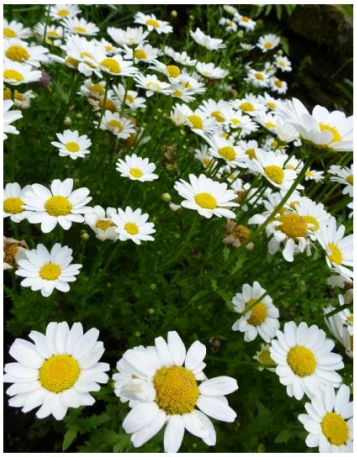




Images above used with permission from The Discovery Trail at Rocky Creek, a project by Equuvation, 2020

Incorporating a quiet trail, surrounded by thick bush and natural surroundings can be an exceptional choice for mindfulness and targeting the biological and emotional domains (Equuvation, 2018). A calm, relaxed walk along the quiet trail while practicing mindful breathing with the horse companion, can support an individual in deregulating after an exciting and physical therapeutic riding lesson (Buzel, 2016).
A facility can also add shaded trellises to their quiet walk if they do not have a thick, dense bush to provide a calming enclosure (Heavenly Gaits Therapeutic Riding Center, 2019. Along the trellises, jasmine or lavender flowers can be added to provide calming smells that can ignite the olfactory system (New Zealand RDA, 2017).

Flowers and Herbs to Ignite Senses



(Images from FreeImages.co.uk, 2020)

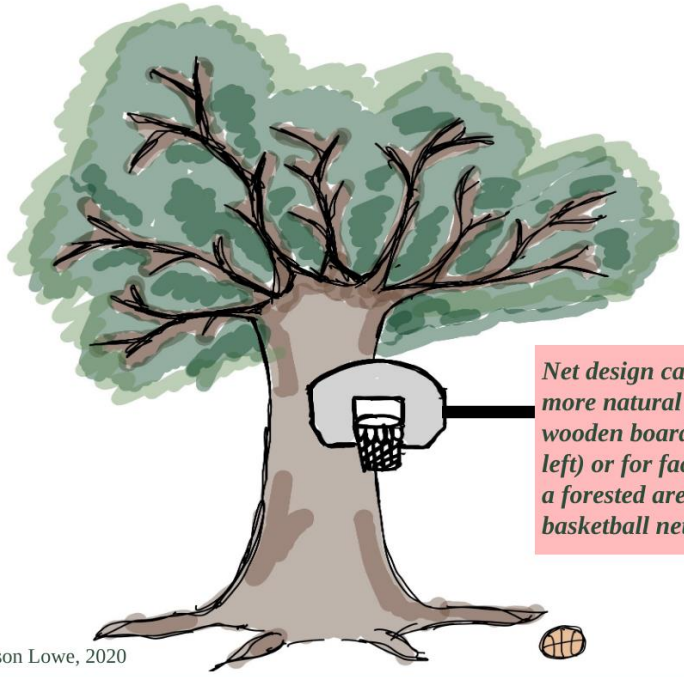
Incorporating an area along the sensory trail that is filled with wildflowers, natural flora and fruit (raspberries, blueberries, blackberries) with vibrant colours can expose riders to natural visual and olfactory stimuli in a calming environment (Heavenly Gaits Therapeutic Riding Center, 2019). Wildflowers and flora also attract an array of animals and insects that riders can observe during their trail ride (Heavenly Gaits Therapeutic Riding Center, 2019).

Planting pots of herbs in specific areas of the trail (quiet trail or near wildflowers) allows the rider to experience new textures and interact with new aromas (Pegasus Therapeutic Riding Organization, 2020). It can also provide an opportunity to engage the social domain in that the team can ask the rider about recipes which use some of the herbs that they saw, smelt or touched (Pegasus Therapeutic Riding Organization, 2020). These conversations could also lead to other discussions about healthy eating, benefits of herbs, "cooking and everyday household activities" (Pegasus Therapeutic Riding Organization, 2020, para. 6) that allows the rider to learn proper turn taking and social cues (Shanker, 2013).

Activities that Improve Motor Functioning and Coordination

Basketball Hoop

Throwing or shooting a ball into a net allows for the rider to practice bilateral and eye-hand coordination, posture and stability which helps in maintaining and conditioning muscles (Ward, 2014). It also allows the rider to partake in a fun game of ten to twenty shots and seeing how many they are able to get in. Depending on how close or far away the rider is from the net, he/she may need to stand up in their stirrups, requiring strong leg and core muscles as well as maintaining balance, all of which requires him/her to multitask in order to achieve the goal of getting the ball in the net.



Net design can either be built in more natural setting by nailing a wooden board to a tree (pictured left) or for facilities that do not have a forested area, a physical basketball net can be included.

Image created by Allyson Lowe, 2020

Tire Toss

Another great activity that is similar to a basketball net and that can be easily incorporated into the natural environment is the tire toss. The tire toss consists of five different tires attached together and hung along a plank or rope between two trees (as shown in design below by Maryland Therapeutic Riding, 2020). The rider positions their horse at an achievable distance from the tires and throws a ball into the appropriate tire. The tire toss is an excellent opportunity for the rider to practice their hand-eye coordination and aiming skills. Similar to the drawing above, some tires can be different sizes, requiring the rider to focus and practice their aiming skills. The tires can also be painted different colours, allowing the rider to practice colour recognition and vocabulary (Pegasus Therapeutic Riding Centre, 2020).

Image used with permission from Maryland Therapeutic Riding, 2020

Activities that Support Executive Functioning Through Play

X's and Horseshoes

X's and Horseshoes is a fun, interactive game that requires the rider to multi-task and improve executive functioning. The rider not only has to think of how to win the game but also stay focused on their balance and position while sitting on top of the horse. It can involve tactile learning in turning and feeling the blocks as they place them in the proper position.

The image right shows an X's and Horseshoes activity station that is versatile in providing various different learning experiences. While the regular games of X's and horseshoes are painted on some blocks, there are other images of different horse markings and riding equipment (Maryland Therapeutic Riding, 2020). Herein the rider could play a matching game that promotes rote memory.

Image used with permission from Maryland Therapeutic Riding, 2020

Beanbags and Shapes

The images pictured right are manmade wooden structures used as a bean bag toss. The cut outs are of various shapes that require the rider to throw the bean bag into the shapes (Maryland Therapeutic Riding, 2020). The instructor can play a game similar to Simon Says where the name of a shape is called out and the rider has to throw the bean bag in the appropriate slot. The bean bag toss is an excellent way to teach the rider about different shapes and works on hand-eye coordination (Maryland Therapeutic Riding, 2020).

Image used with permission from Maryland Therapeutic Riding, 2020

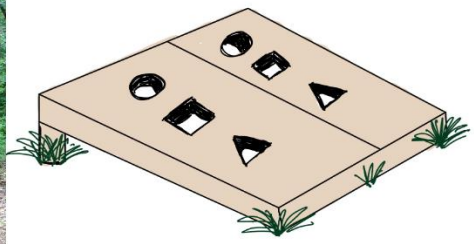


Image created by Allyson Lowe, 2020

Abacus/Counters on a String

The last activity pictured right is of various strings attached to two posts. Along those strings are several coloured balls (The Discovery Trail, 2020; Equuvation Inc., 2020). This activity is excellent to practice both colour recognition and simple math skills. The rider may have to count all the balls of a certain colour, separate the balls into different groups, and subtract or add one group to another, etc (The Discovery Trail, 2020; Equuvation Inc., 2020). The rider also has to maintain balance while on top of the horse, with the assistance of a sidewalker in order to physically move any of the balls on the line (The Discovery Trail, 2020; Equuvation Inc., 2020).

Image used with permission from The Discovery Trail at Rocky Creek, a project by Equuvation, 2020

Lakehead University

Masters of Education
Portfolio Route

Incorporating Arts into Sensory Trail

Wind Chimes

Image used with permission from Maryland Therapeutic Riding, 2020

Image used with permission from Pegasus Therapeutic Riding Organization, 2020

Implementing wind chimes as one activity centre is not only an excellent way to engage a rider's olfactory system, it also supports optimal self-regulation under the emotional domain as the rider is able to be creative and express themselves or their feelings through music (Shanker, 2013). To engage the olfactory system, the instructor can ask the rider to touch different wind chimes and differentiate which ones have a low, deep pitch, and which ones have a high pitch (Pegasus Therapeutic Riding Centre, 2020). Music or creative expression can also be a learning strength for riders, and having different melodies placed on a sign next to the windchimes (which should be changed every so often to incorporate new learning experiences) allows them to play and experiment while learning a new skill or interest (Shanker, 2013).

Drawing Station/Chalkboard

A drawing/chalkboard station can be added to a sensory trail to incorporate expressive play during the ride. A chalkboard or drawing station (pictured right) which is positioned at the horse/rider's height and be easily erased to allow the rider to create more pieces of artwork (The Discovery Trail, 2020; Equuvation Inc., 2020, Maryland Therapeutic Riding, 2020). The drawing station can also be on a paper backdrop where the art piece can be ripped off and brought home with the child to remember their experience.

Image used with permission from The Discovery Trail at Rocky Creek, a project by Equuvation, 2020

Image used with permission from Maryland Therapeutic Riding, 2020

Mirrors

Image used with permission from The Discovery Trail at Rocky Creek, a project by Equuvation, 2020

Incorporating mirrors along either side of the trail is another excellent way for riders to partake in expressive play (The Discovery Trail, 2020; Equuvation Inc., 2020). They can look at themselves in the mirror and pretend to perform a drama or skit while on horseback. The instructor may also provide some props that are soft and unobtrusive to add to the experience. Mirrors also provide the opportunity for riders to identify proper riding posture and to learn spatial recognition in how they position themselves while on horseback (The Discovery Trail, 2020; Equuvation Inc., 2020).

Bibliography

Akyurt, E. (2020). Brown soil - free stock photo. Retrieved May, 2020 from https://www.pexels.com/photo/brown-soil-3859201/

Bone, J. (2013). The animal as fourth educator: a literature review of animals and young children in pedagogical relationships. *Australasian Journal of Early Childhood*, *38*(2), 101–120.

Buzel, A. H. (2016) *Beyond words: The healing power of horses*. Bloomington, IN: Authorhouse.

Cambridge Riding for the Disabled. (2020). *Cambridge RDA proposed sensory trail*. Retrieved from https://www.rda-cambridge.com/page/sensory-trail-project/

Chevalier, G. (2016, November 9). *Riding center helps transform lives*. Retrieved from https://www.timesfreepress.com/news/community/story/2016/nov/09/riding-center-helps-transform-lives/396504/

The Discovery Trail at Rocky Creek. (2018). *Station guide A to Z: At-a-glance sharing and planning document*, [PDF File]. Equuvation Inc.

The Discovery Trail at Rocky Creek. (2020). *Sensory stations*. Retrieved from http://www.rcdiscoverytrail.org/sensory-stations

Equuvation Inc. (2020). The Discovery Trail. Retrieved May, 2020, from http://www.equuvation.org/the-discovery-trail

Freeimges.co.uk. (2020). Assorted wild garden flowers in summer. Retrieved May, 2020, from http://freeimages.co.uk/galleries/nature/flora/slides/wild_garden_flowers.htm

Freeimges.co.uk. (2020). Cultivated ornamental white daisies. Retrieved May, 2020, from http://freeimages.co.uk/galleries/nature/flora/slides/white_daisys.htm

Freeimges.co.uk. (2017). Cumbrian woodland landscape. Retrieved May 2020, from http://freeimages.co.uk/galleries/nature/woodland/slides/cumbriawoodland02961.htm

Freeimges.co.uk. (2020). Purple Flowers Growing in the Garden. Retrieved May, 2020, from http://freeimages.co.uk/galleries/nature/flora/slides/flora02030.htm

Freeimges.co.uk. (2020). Sky blue clusters of Valeriana. Retrieved May 1, 2020, from http://freeimages.co.uk/galleries/nature/flora/slides/lilac.htm

Hallberg, L. (2018). *The clinical practice of equine-assisted therapy: Including horses in*

human healthcare. New York: Routledge.

Heavenly Gaits Therapeutic Riding Center. (2019). *Sensory trails*. Retrieved May, 2020 from https://heavenlygaitstrc.weebly.com/sensory-trails.html

High Hopes Therapeutic Riding Organization. (2020). *Programs*. Retrieved from https://highhopestr.org/programs/

Libreshot. (2019, January 28). Cut Log: Free Stock Photo. Retrieved May 2020, from https://libreshot.com/cut-log/

Mahoney, J. (2020). Small wood bridge free stock photo - Public Domain Pictures. Retrieved May, 2020 from https://www.publicdomainpictures.net/en/view-image.php?image=11652

Maryland Therapeutic Riding. (2020, April 02). *Services: Maryland Therapeutic Riding: Crownsville, Maryland*. Retrieved April, 2020, from https://www.horsesthatheal.org/services/

NZRDA. (2017). *NZRDA case study: Building a sensory trail*. Retrieved from http://www.rda.org.nz/thearena/Resources/NZRDA%20Case%20Study%20-%20Building%20a%20sensory%20trail.pdf

Pikirepo. (2020). Royalty-free HD gravel photos. Retrieved May, 2020 from https://www.pikrepo.com/search?q=gravel

Piktochart. (2020). *Create Infographics, Presentations & Flyers*. Retrieved from https://piktochart.com/

Piqsels. (2020). Moss, background, nature, forest, background moss, pattern. Retrieved May, 2020, from https://www.piqsels.com/en/public-domain-photo-olqyi

PIXNIO. (2017, March 18). Free picture: Brown, wood, chipboard, mulch, texture. Retrieved May, 2020 from https://pixnio.com/textures-and-patterns/wood-texture/brown-wood-chipboard-mulch-texture

Pxhere. (2020). Free images: Grass, ground, texture, sidewalk, floor, cobblestone. Retrieved May, 2020, from https://pxhere.com/en/photo/697994

Shanker, S. (2013). *Calm, alert and learning: Classroom strategies for self-regulatio*n. Toronto: Pearson Canada Inc.

Smith, C. (2013). Being sense-ible: the beauty and fun of sensory trails. (Humans, Horses,

and Health). *Palaestra*, *27*(1), 49–50.

The Summer House. (2014). *The Discovery Trail - Preview Event*. Retrieved May, 2020, from https://thesummerhouse.pixieset.com/thediscoverytrail-previewevent/

Ward, E. (2014, June 6). Sensory trail for therapeutic horse riding. Retrieved May, 2020 from https://www.pinterest.ca/slamdi/sensory-trail-for-therapeutic-horse-riding/

Wikimedia Commons. (2005). File.Sand. Retrieved May, 2020 from https://commons.wikimedia.org/wiki/File:Sand.jpg

References

Al-Hmouz, H. & Arabiat A. (2015). Therapeutic horseback riding and children with autism spectrum disorders. *The Journal of the International Association of Special Education*, Vol. 16, 42-50.

Anderson, S., & Meints, K. (2016). Brief report: The effects of equine-assisted activities on the social functioning in children and adolescents with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 46(10), 3344-3352. Retrieved from http://ezproxy.lakeheadu.ca/login?url=https://search-proquest-com.ezproxy.lakeheadu.ca/docview/1871582854?accountid=11956

Bachi, K. (2012). Equine-facilitated psychotherapy: The gap between practice and knowledge. *Society & Animals*, *20*(4), 364–380.

Barba, B.E (1995). A critical review of research on human/companion animal relationships: 1988 through 1993. *Anthrozoos*, 8 (1), 9-20.

Bass, M. M., Duchowny, C. A., & Llabre, M. M. (2009). The effect of therapeutic horseback riding on social functioning in children with autism. *Journal of Autism and Developmental Disorders*, 39(9), 1261-1267. Retrieved from http://ezproxy.lakeheadu.ca/login?url=https://search-proquest-com.ezproxy.lakeheadu.ca/docview/61851543?accountid=11956

Beck, A.M. (1999). Companion animals and their companions: sharing a strategy for survival. *Bulletin Science, Technology & Society*, 19(4), 281-285.

Birke, L. (2008). Talking about horses: Control and freedom in the world of "Natural Horsemanship". *Society & Animals*, 16(2), 107-126.

Bone, J. (2013). The animal as fourth educator: a literature review of animals and young children in pedagogical relationships. *Australasian Journal of Early Childhood*, 38(2), 101–120.

Borgi, M., Loliva, D., Cerino, S., Chiarotti, F., Venerosi, A., Bramini, M., . . . Cirulli, F. (2016). Effectiveness of a standardized equine-assisted therapy program for children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 46(1), 1-9. Retrieved from http://ezproxy.lakeheadu.ca/login?url=https://search-proquest-com.ezproxy.lakeheadu.ca/docview/1773217732?accountid=11956

Bustad, L. K. (1981). Symposium Summary. In Paper presented at *The international symposium on human-pet relationship*; Vienna, Austria.

Buzel, A. H. (2016) *Beyond words: The healing power of horses*. Bloomington, IN: Authorhouse.

Cambridge Riding for the Disabled. (2020). *Cambridge RDA Proposed Sensory Trail*. Retrieved from https://www.rda-cambridge.com/page/sensory-trail-project/

Canadian Therapeutic Riding Association. (2018). *CanTRA Services: Centre Accreditation and Instruction certification*. Website. Retrieved on March, 25th, 2018 from Retrieved from https://cantra.ca/en/our-services

Chevalier, G. (2016, November 9*). Riding center helps transform lives*. Retrieved from https://www.timesfreepress.com/news/community/story/2016/nov/09/riding-center-helps-transform-lives/396504/

Colston, C, M.. (2014). The feasibility of implementing equine-assisted activities and therapy curriculum for higher education. *The Faculty of the Hutson School of Agriculture*. Retrieved from Proquest LLC Thesis Database.

Darling, K. (2014). The experience of equine assisted personal growth. [Dissertation; Michigan School of Professional Psychology], ProQuest LLC.

The Discovery Trail at Rocky Creek. (2018). *Station guide A to Z: At-a-glance sharing and planning document*, [PDF File]. Equuvation Inc.

The Discovery Trail at Rocky Creek. (2020). *Sensory stations*. Retrieved May, 2020 from http://www.rcdiscoverytrail.org/sensory-stations

Equuvation Inc. (2020). *The Discovery Trail*. Retrieved May, 2020, from http://www.equuvation.org/the-discovery-trail

Fine, A. H. (2011). *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. London, UK: Elsevier.

Gabriels, R. L., Agnew, J. A., Holt, K. D., Shoffner, A., Zhaoxing, P., Ruzzano, S., Mesibov, G. (2012). Pilot study measuring the effects of therapeutic horseback riding on school-age children and adolescents with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 6(2), 578-588. http://ezproxy.lakeheadu.ca/login?url=https://search-proquest-com.ezproxy.lakeheadu.ca/docview/1023529156?accountid=11956

Gabriels, R., Pan, Z., Dechant, B., Agnew, J., Brim, N., & Mesibov, G. (2015). Randomized controlled trial of therapeutic horseback riding in children and adolescents with autism spectrum disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 54(7), 541–549.

Grandin, T. (2011). *The way I see it: A personal look at autism and Asperger's*. Arlington: Future Horizons Inc.

Grandin, T. (2010). *Thinking in pictures: My life with autism*. New York: Second Vintage Books.

Grandin, T. (2008). *Humane Livestock Handling*. Storey Publishing.

Green Chimneys Organization. (2020). *About Us*. Retrieved from https://www.greenchimneys.org/about-us/

Hallberg, L. (2018a). *The clinical practice of equine-assisted therapy: Including horses in human healthcare*. New York: Routledge.

Hallberg, L. (2018b). *The equine-assisted therapy workbook: A learning guide for professionals and students*. New York: Routledge.

Healing Hooves Organization (2019). *About healing hooves*. Retrieved from https://healinghooves.ca/about-healing-hooves/

Heavenly Gaits Therapeutic Riding Center. (2019). *Sensory trails*. Retrieved May, 2020 from https://heavenlygaitstrc.weebly.com/sensory-trails.html

High Hopes Therapeutic Riding Organization. (2020). *Programs*. Retrieved from https://highhopestr.org/programs/

High Hopes Therapeutic Riding Organization. (2020). *Our history*. Retrieved from https://highhopestr.org/about/our-history/

Holm, S. (2017). The effects of therapeutic horseback riding on communication in children and adolescents with developmental disorders. *Mississippi State University*, *Proquest LLC*. Retrieved from Proquest LLC Thesis Database

Jenkins, S., & Digennaro Reed, F. (2013). An experimental analysis of the effects of therapeutic horseback riding on the behaviour of children with autism. *Research in Autism Spectrum Disorders*, 7(6), 721–740.

Irwin, C. (2001). *Horses don't lie: What horses teach us about our natural capacity for awareness, confidence, courage, and trust*. Boston, MA: Da Capo Press.

Kohanov, L. (2001). *The tao of equus: A woman's journey of healing and transformation*

through the way of the horse.

Lac, V. (2017). *Equine-facilitated psychotherapy and learning: The human-equine relational development (HERD) approach*. London, UK: Elsevier.

Lakehead University Department of Education. (2020). Resources for your teaching practicum. *Lakehead University*. Retrieved from https://www.lakeheadu.ca/programs/departments/education/undergraduate/about-your-teaching-practicum/tbay-teaching-practicums/resources-for-your-practicum

Machin, M. J., & Nicklin, E. (2019). *HOOD - Horse Healthy*. Retrieved from http://upstart-annapolis.com/hood-horse-healthy/

Maryland Therapeutic Riding. (2019, July 23). *Services: Maryland Therapeutic Riding: Crownsville, Maryland*. Retrieved from https://www.horsesthatheal.org/services/

McCoy, K. M. (2011). *Autism from the teacher's perspective: Strategies for classroom instruction*. Denver, CO: Love Publishing Company.

McDaniel Peters, B. C., & Wood, W. (2017). Autism and equine-assisted Interventions: A systematic mapping review. *Journal of Autism And Developmental Disorders*, (10), 3220.

MERIT Centre. (2019, June 18*). Shanker Self-Reg® - Self-Reg with Dr. Stuart Shanker*. Retrieved from https://self-reg.ca/self-reg/

Ministry of Ontario (1994). *Home Care and Community Services Act*. https://www.ontario.ca/laws/statute/94l26

Montgomery S. (2012). Temple Gradin: *How the girl who loved cows embraced autism and changed the world*. Boston: Houghton Mills Books.

Nussen, J. & Becker, L. (2012). *Soul Recovery: Equine assisted activities for healing from abuse by others, loss of others and loss of self*. EquineWorks, INC.

NZRDA. (2017). NZRDA case study: Building a sensory trail [PDF File]. *NZRDA*. Retrieved from http://www.rda.org.nz/thearena/Resources/NZRDA%20Case%20Study%20-%20Building%20a%20sensory%20trail.pdf

Ontario Ministry of Education (2017). *Special education in Ontario kindergarten to grade 12: Policy and resource guide*. http://edu.gov.on.ca/eng/document/policy/os/onschools_2017e.pdf

Ontario Ministry of Education (2010). *Caring and safe schools in Ontario: Supporting students with special education needs through progressive discipline kindergarten*

to Grade 12.

Ontario Ministry of Education (2007). *Effective Educational Practices for Students with Autism Spectrum Disorder.* http://edu.gov.on.ca/eng/document/policy/os/onschools_2017e.pdf

Pedersen, H. (2010). *Animals in schools: processes and strategies in human-animal education*. West Lafayette, Indiana: Purdue University Press.

Pegasus Therapeutic Riding Centre. (2020). *Pegasus Farm Sensory Trail*. Retrieved from http://www.pegasustr.org/programs/pegasus-farm-sensory-trail/

Piktochart. (2020). *Create Infographics, Presentations & Flyers*. Retrieved from https://piktochart.com/

Ratcliffe, K. T., & Sanekane, C. (2009). Equine-assisted therapies: Complementary medicine or not? *Australian Journal of Outdoor Education*, 13(2), 33-43.

Rigby, B. R., & Grandjean, P. W. (2016). The Efficacy of Equine-Assisted Activities and Therapies on Improving Physical Function. *Journal of Alternative & Complementary Medicine*, 22(1), 9-24. doi:10.1089/acm.2015.0171

Roberts, M. (1998). *The man who listens to horses*. Ballantine Books.

Selby, A. (2009). A systematic review of the effects of psychotherapy involving equines. [Dissertation, University of Texas]. Proquest LLC

Shanker, S. (2013). *Calm, alert and learning: Classroom strategies for self-regulation*. Toronto: Pearson Canada Inc.

Simpson, R. L., & Smith Myles, B. (1998). *Educating children and youth with autism: Strategies for effective practice*. Austin, TX: PRO-Ed Inc.

Sirois, S. (2013, February 12). *7 Best Sensory Trail Ideas images: Therapeutic horseback riding, Riding lessons, Horse therapy*. Retrieved from https://www.pinterest.ca/impsmama/sensory-trail-ideas/

Smith Hybels, C. (2014). Building capacity for evaluating outcomes in therapeutic riding: A collaborative approach. *TRAIN Interim Progress Report*, 1–10. Retrieved from https://highhorses.org/wp-content/uploads/2015/01/BuildingCapacityforEvaluatingOutcomesInTherapeuticRiding-InterimProgressReportAugust2014.pdf

Strozzi Mazzucchi, A. (2015). *Equine guided education: Horses healing humans healing earth*. Casari Ranch, LLC.

Trotter, K. (2012). *Harnessing the power of equine assisted counselling: Adding animal assisted therapy to your practice*. New York: Routledge.

Vincent, A & Farkas, K. L. (2017). Application of attachment theory to equine-facilitated therapy. *Society Register*, 1(1), 7–22.

Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

Ward, E. (2014, June 6). *Sensory Trail for Therapeutic Horse Riding*. Retrieved from https://www.pinterest.ca/slamdi/sensory-trail-for-therapeutic-horse-riding/

Ward, S. C., Whalon, K., Rusnak, K., Wendell, K., & Paschall, N. (2013). The association between therapeutic horseback riding and the social communication and sensory reactions of children with autism. *Journal of Autism and Developmental Disorders*, 43(9), 2190-2198.

Weldon, T.,D. (2017). An evaluation of human-horse interactions, children's attachment and trust. *Northcentral University School of Psychology*. Retrieved from Proquest LLC Thesis Database

Windreach Farm Organization (2020). Equine services. *WindReach Farm*. Retrieved from http://windreachfarm.org/programs_services/equine-services/

Windreach Farm Organization (2020). Mission and vision. *WindReach Farm*. Retrieved from http://windreachfarm.org/about-us/vision-and-mission/

Windreach Farm Organization. (2020). Programs and services. *WindReach Farm*. Retrieved from http://windreachfarm.org/programs_services/

World Health Organization. (2019). Autism spectrum disorders. *World Health Organization.* Retrieved from https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders