Abstract

The field of human-equine interactions is growing and while we are learning more about the impact of children's structured interactions with horses in equine assisted, learning and therapeutic contexts, we know relatively less about the impact of children's unstructured interactions with horses and a diversity of farm animals. This exploratory study evaluated the impact of participation in a nine-week after-school horsemanship and farm-based program on children's perceived social emotional experiences and *belief in animal mind*. Prior to beginning the nine-week program and upon its conclusion, we interviewed eight children (5 girls; 3 boys; aged 9 to 11 years) who were referred to the program because they were living in socioeconomically disadvantaged homes. Children responded to open-ended questions about their social and emotional experiences and their *belief in animal mind*. Salient themes in children's pre- and post-program responses were identified using qualitative content analysis. Overall, findings revealed that while children were overwhelmingly excited about starting the program, they lacked confidence in their ability to manage the horses. Children's responses revealed pre-to-post-program increases in positive emotions, positive social and emotional experiences, and *belief in animal mind*. Children's responses also revealed the following themes as key aspects of their experience in the program: 1) *New opportunities and interest in the program*, 2) *New social opportunities and support*, 3) *Feeling more confident with horses and farm animals*, and 4) *Sadness that the program was ending.* The significance of these findings for educational policy and within the broader context of children's unstructured interactions with a diversity of animals is discussed.

Word count: 255; Keywords: children's horsemanship activities, equine activities and children, children's farm-based activities, children's *belief in animal mind*, child-animal bond

The role of participation in an after-school horsemanship farm-based program on children's social emotional experiences and *belief in animal mind*: An exploratory study

Introduction

The field of human-equine interactions is growing and we are still learning more about the impact of children's interactions with horses in structured equine assisted activities, facilitated learning and therapeutic contexts (Pendry, Carr, & Vandagriff, 2018). For example, equine-assisted activities and therapies are increasing in popularity as a feasible therapeutic approach for a range of mental health and developmental problems including symptoms of anxiety and depression and behavior problems (e.g., Acri, Hoagwood, Morrissey, & Zhang, 2016; Boshoff, Grobler, & Nienaber, 2015; Conniff, Scarlett, Goodman, & Appel, 2005; Kendall, Maujean, Pepping, & Wright, 2014). Studies emerging from Europe (i.e., the UK, Italy, Norway) and the USA also show that therapeutic riding can improve specific aspects of social functioning and also reduce maladaptive behavior traits among children with autism spectrum disorder (e.g., Anderson & Meints, 2016; Borgi et al., 2016; Erdman, Miller, & Jacobson, 2015; Gabriels et al., 2012; 2015). Further, programs that incorporate equine assisted learning have been shown to have positive effects on adolescents' self-perceived social support (Hauge, Kvalem, Berget, Enders-Slegers, & Braastad, 2013), task persistence and mastery (Hauge, Kvalem, Pedersen, & Braastad, 2013) and social competence and behavior (Pendry & Roeter, 2013; Pendry, Carr, Smith & Roeter, 2014), and can reduce cortisol levels and promote positive affective experiences among adolescents (Frederick, Hatz, & Lanning, 2015; Pendry, Carr & Vandagriff, 2018; Pendry, Smith, & Roeter, 2014).

The above brief review attests to the empirical interest in children's participation in structured equine-assisted programs. However, relatively less is known about the well-being benefits that children derive from their unstructured interactions with horses and other

animals in farm-based contexts (one exception is a study by Hauge et al., 2013 that examined adolescents' structured interactions with horses on small farms to avoid the performance pressure often found at riding schools). For example, care farming, sometimes referred to as green care or social farming, is gaining in popularity in Europe and North America (Hassink, DeBruin, Berget, Elings, 2017; Murray et al., 2019; Sempik, Hine, & Wilcox, 2010). Care farms provide alternative settings where people can interact with nature and animals as compared to more traditional therapeutic health care settings (i.e., short-term counselling or psychological services; Hassink et al., 2017; Moore & Duffin, 2020). In this way, the objectives of care farming are in line with social care and health policies designed to support and promote human physical and mental health and well-being. On care farms, participants are afforded opportunities to interact with and care for the land (on agricultural farms), nature and a diversity of farm and companion animals including dogs, cats, horses, chickens, pigs, sheep and cows.

A key research question regarding care farming (and less formal interactions with horses and farm animals, in general) is whether such a context provides similar well-being benefits to children. This is an important research question to address for several reasons. First, research suggests that children's companion animals are often diverse and can include dogs, cats, fish, birds, reptiles, and farm and forest animals (e.g., horses, pigs, goats, chipmunks) and all share an emotionally meaningful relationship with children and hold special status in their lives (Amiot, Bastien, & Martens, 2016). Further, research shows that children's participation in a one-week humane education curriculum within the context of a camp-based setting involving dogs, cats and farm/forest animals was associated with children's reports of sharing significantly closer bonds and friendships with their companion animals (names withheld to protect anonymity of review, 2015). Second, care farming is in line with efforts in European and North American schools to promote environmental

conservation and to encourage children and youth to reconnect with nature and animals (Bekoff, 2014; Crain, 2014). Third, it is often more feasible and cost-effective to organize visits to farm-based contexts and to facilitate children's less structured experiences with horses and a diversity of farm animals, as compared with organizing and overseeing children's participation in more structured equine-assisted programs. In this way, farm-based contexts are also accessible to a greater proportion of children and youth who might otherwise not have the opportunity to experience the benefits of engaging with horses in structured equine-assisted contexts.

The results of a small number of studies are promising and suggest that, similar to the benefits documented for individuals participating in structured equine-assisted activities, engagement with farm animals and nature on care farms can also promote the well-being of different client groups. For example, interactions with farm animals and nature on care farms have been shown to support the well-being of young adults with clinical depression (Pedersen, Ihlebæk, & Kirkevold, 2012), young adults experiencing mental health challenges (Schreuder et al., 2014) or who have dropped out of school and must reestablish trust in social relationships (Kogstad, Agdal, & Hopfenbeck, 2014), and children with autism spectrum disorder (Ferwerda-van Zonneveld, Oosting, & Kijlstra, 2012).

These latter findings suggest the need for further studies examining the impact of farm-based contexts on children's social and emotional well-being. Another equally important research question is how these contexts and experiences can promote children's perceptions about animals. To date, studies on children's participation in structured equine-assisted activities and with animals in farm-based contexts have mostly included measures of mental health, well-being and/or learning outcomes. There is a gap in our understanding of how children's engagement with a diversity of animals in farm-based contexts might shape their understanding of animal minds and attitudes towards and treatment of animals.

On this latter note, *belief in animal mind* involves attributing animals with mental capacities, essentially believing that animals have the ability to think, feel, and experience emotions (Hawkins & Williams, 2016). *Belief in animal mind* is a critical cognitive and emotional ability that may influence the moral status of animals, attitudes towards animals, as well as animal welfare (Ellingsen, Zanella, Bjerkas, & Indrebo, 2010; Hawkins & Williams, 2016). In fact, in one study, children's *belief in animal mind* was positively associated with attachment to animal companions and more positive attitudes, compassion and humane behavior toward animals, and negatively associated with the acceptance of intentional and unintentional animal cruelty and neglect (Hawkins & Williams, 2016). Further, at least in adults, research suggests that viewing pets as family members is associated with socially supportive anthropomorphism, which in turn can improve emotional well-being (McConnell, Lloyd & Humphrey, 2019).

Importantly, research suggests that children's *belief in animal mind* is linked to knowledge about and with family-based and cultural experiences with animals. Menor-Campos, Hawkins & Williams (2018) found that Spanish children aged 6 to 13 years espoused *belief in animal mind*, regardless of the children's age, gender, pet ownership or the species of the animal. However, the children had more difficulty attributing sentience to animals, particularly animal species which they interacted with less regularly (e.g., cows, frogs, goldfish). Research also shows that pets are commonly perceived to have higher cognitive capacities than other animals (Maust-Mohl, Fraser, Morrison, 2012), and that children may overestimate animal minds in those they perceive as similar, familiar, or phylogenetically closer to humans (Knight, Vrij, Cherryman, & Nunkoosing, 2004). There is also evidence that children's ability to identify animal emotions increases significantly as a function of the child's age and experiences with companion animals at home (Rocha, Gaspar, & Esteves, 2016).

In addition, anthropomorphism, the application of human characteristics to nonhuman animals, may affect how children rate animals on sentience or consciousness (Collins, 2012) and be associated with a more positive quality of relationship between adults and their dogs (Vink & Dijkstra, 2019). In another study of Spanish children aged 6 to 13 years, having a dog or small mammal at home and scoring animals higher on sentience capabilities were associated with higher pro-animal attitudes (Menor-Campos, Hawkins, & Williams, 2019). Research also suggests that, in the context of pet ownership, the development of child-animal bonds varies as a function of age, with older children (11 to 14 years) developing bonds more easily with species that are not behaviorally similar to humans (e.g., reptiles, fish) and younger children (6 to 10 years) showing a preference towards species behaviorally closer to humans (e.g., dogs, cats; Hirschenhauser, Meichel, Schmalzer, & Beetz, 2017).

These findings point to the importance of animal-related experiences and education in shaping children's *belief in animal mind*. It is possible that spending quality, unstructured time on a farm with horses and diverse animals over a sustained period might create the context for direct and close contact between children and animals and promote the type of social engagement and emotional bonding that leads to increases in children's *belief in animal mind*. Studies show that children's interactions with dogs, cats and farm/forest animals within the context of a camp-based setting are associated with children's ability to recognize and interpret emotional and mental states (e.g., intentions and desires) in animals (names withheld to protect anonymity of review, 2019; 2017). However, there is still a dearth of research exploring the benefits of engaging with horses (including in structured equine-assisted activities) and a diversity of animals in farm-based contexts on children's understanding of animal minds. To respond to this gap in the literature, this study explores the role of participation in an after-school horsemanship farm-based program on the quality of children's social and emotional experiences and their *belief in animal mind*. In light of

growing efforts across North American schools to promote environmental conservation and to reconnect children and youth with nature (Bekoff, 2014; Crain, 2014), this research responds to a timely need to innovatively strengthen students' well-being through hands-on interactions with horses and other animals in unstructured farm-based contexts and foster their *belief in animal mind*.

The present study

This exploratory study examined the impact of children's participation in a nine-week after-school horsemanship farm-based program on the quality of children's social and emotional experiences and *belief in animal mind*. The program involved horsemanship activities including horse care and riding to strengthen social and emotional bonds among children from economically disadvantaged homes. The program offered a once weekly 3-hour long session, for a total of nine weeks. Consistent with the goals of care farming and equine-assisted programs our outcome measures included aspects of children's self-reported social and emotional experiences (e.g., positive and negative emotions) and children's *belief in animal mind*. Our research aims to address the following questions:

(a) Is participation in the program associated with reports of more positive and fewer negative social emotional experiences among children from pre-to-post-program?

(b) Is participation in the program associated with increases in children's *belief in animal mind* from pre-to-post-program?

(c) What aspects of the program do children perceive as contributing to a positive experience in the program?

First, we expected that a content analysis of the themes in the children's responses would reflect more positive and fewer negative emotions and social emotional experiences from pre-to-post program participation. This hypothesis was based on research findings suggesting that participation in both structured EAAL and often less structured care farms

can strengthen well-being (e.g., self-confidence, feelings of mastery) in young people (e.g., see Hassink et al., 2017; Hauge et al., 2013) Pendry, Carr, & Vandagriff, 2018). Second, we expected that a content analysis of the themes in the children's pre-to-post program responses would reflect increases in children's *belief in animal mind*, references to human-animal similarity and positive perceptions of animals. This hypothesis was based on the contact hypothesis (Allport, 1954) which suggests that spending time on a farm with horses and diverse animals over a sustained period might create the context for direct and close contact between children and animals and promote the type of social engagement and emotional bonding that leads to increases in children's *belief in animal mind*. We also explored the children's responses to identify the program aspects (if any) linked with their positive experiences across the nine weeks.

Methods

Participants and Procedures

This exploratory, small case study was designed to examine the impact of a horsemanship and farm-based program on children from socioeconomically disadvantaged homes. We chose to conduct pre-to-post-program interviews with the children because our research question was exploratory and we aimed to track the children's individual perspectives on aspects of the program across the nine-weeks (Creswell & Plano-Clark, 2011). To the best of our knowledge, no studies have tracked how children's experiences in a similar farm-based program might be received by the children themselves and might lead to important shifts in the quality of children's social emotional experiences and *belief in animal mind*.

A convenience sample of children enrolled in a nine-week after-school *Horse Cents for Kids* program was recruited in the spring of 2019 from a school located in South-Western Ontario, Canada. This study gathered qualitative data from eight children (5 girls; 3 boys)

aged from 9 to 11 years from the same grade 4/5 split classroom. The sample of children was mainly Canadian-European (English as a first language) and was drawn from families that were identified by the school principal as currently experiencing socioeconomic challenges. None of the children had previously taken part in a horsemanship or riding program or had experience working with farm animals.

All of the families whose children were enrolled in the after-school *Horse Cents for Kids* program were invited to participate in this study. The overall program was delivered by a local riding stable and included a total of nine, three-hour after-school weekly sessions (Friday afternoons). These weekly sessions included both individual and group-focused horse- and farm animal activities. Each of the nine after-school sessions was held in a large classroom-like setting within the stable and was led by the program organizers, a husband and wife team with over 20 years of experience organizing camps for children, and four trained youth helpers. The youth helpers were all females ranging in age from 11 to 18 years who had previous training (from one to ten years) in horsemanship activities, and their weekly interactions and their riding instructions and assistance with the children remained standardized each week.

University ethics clearance was obtained and after receiving parental consent (in writing) and the children's verbal assent, the children were interviewed individually in a private room. The researchers and study authors collected all data. All of the children attended each of the nine weekly sessions, and no child dropped out of the study. Data collection took place during a total of two, three-hour sessions (April to June 2019), and took place at the beginning of the very first week of the program and was repeated at the end of the last day of the program – each data collection session lasted approximately 1.5 hours.

In-person interviews were carried out at two separate time points: before the *Horse Cents for Kids* program began on April 26th, 2019 and when the program ended on June 21st,

2019. Children were split up into two groups and two researchers (the study authors) conducted the interviews with the same children at both time points. Children responded to questions about what species of companion animal(s) (including horses), if any, their family lived with both currently and previously (during the child's lifespan). Six children reported currently having at least one companion animal at home including mostly cats and dogs followed by reptiles, and two children reported that they did not currently have a companion animal at home, but both had a fish in the past. Three children reported only having minimal previous contact with a horse either at a relative's home or at a birthday party, and none of the children reported having horses or farm animals at home. Examination of the data did not reveal differences in pet ownership (i.e., dogs versus cats) between boys and girls.

Horse Cents for Kids **Program**

The farm was surrounded by animals (e.g., miniature horses, miniature donkeys, goats, potbellied pig, rabbits, cats, dogs) and the children came to the farm each week (with each weekly session lasting approximately 3 hours) and could interact freely with the animals and they engaged in activities including horseback riding, grooming and caring for horses and the farm animals. In addition to the time spent with the horses and farm animals, the children were provided with a warm dinner and engaged in some group-focused activities led by the two program organizers. Also, the four youth helpers assisted each week with the feeding, grooming, saddling and riding of the horses.

The program schedule was designed based on the time frame of the program and the activities that would allow for the best experience/education about horses and other animals on the farm. Each week the children were split into two groups of four for the activities, with the program organizers each taking turns leading one of the two groups. The children were paired with the same horse and handler whenever possible and no specific criteria were used to match horses to each child. Farm activities included: 1) engaging in horsemanship

activities including mucking out the horse stalls, and grooming, tacking up, leading and riding a horse for 30 minutes each session, 2) learning about horses and farm animals and their social and physiological needs, learning how to properly approach and interact with horses and farm animals, how to properly groom, care, feed and train the animals, understanding the physical, social and emotional needs of the animals and how to help farm animals in distress, 3) interacting in games and physical activities with their peers about how to protect and play with horses and farm animals, 4) spending free time with and feeding the farm animals, and 5) making crafts involving horse and farm animal themes such as creating clay animals.

Measures

Qualitative Interviews with Children. The pre- and post-program interview questions were designed to gain insight into children's experiences in the *Horse Cents for Kids* program and the impact of their involvement in the program on the quality of their social and emotional experiences and *belief in animal mind*. We used the same set of interview questions across both interviews to ensure consistency in the data that was collected (as detailed below). We asked how the children felt about the program and explored whether their participation in this program was associated with shifts in how they felt on a wide range of measures including: 1) *perceptions of friendships and social connectedness, support and belonging* (e.g., How well do you know the other kids in the program? Do you feel a sense of connection or a bond with the other kids in the program? Do you feel supported by (and a sense of belong with) the people in the program? How do you get along with your teachers and schoolfriends?, 2) *general feelings about the self* (i.e., positive and negative emotions at the start and end of the nine-week program, and on most days and on a day when they are not at the farm; e.g., How do you feel now that you have arrived at the farm? How did you feel each week when you arrived at (or left) the farm? Can you describe

how you feel about yourself on a typical day when you are not at the farm?), and 3) *belief in animal mind* (i.e., their feelings towards and beliefs about the thoughts and feelings of different types of animals; e.g., How do you feel about companion/horses/farm/wild animals and do you think they have thoughts and feelings and, if so, why or how do you know that?).

In the second set of interviews, we added questions specific to the program activities (e.g., Tell us a bit about your time in the *Horse Cents for Kids* program. What was the best part of the program? What was your most and least favorite program activity?). The interviews lasted between 15 and 25 minutes in length and were audio recorded. The researchers took independent field notes immediately after each set of interviews, and the interviews were transcribed verbatim by an undergraduate research assistant.

Data Analytic Strategy

Interviews were recorded, transcribed verbatim, and subsequently thematically coded using a qualitative content analysis to identify salient themes in children's pre- and post-program responses (Hsieh & Shannon, 2005; Neuendorf, 2017). After an initial open coding process that enabled us to identify themes across the children's interview responses, a careful analysis was applied to the codes that resonated with themes of children's "*social emotional experiences*" and "*belief in animal mind*". Themes of children's *positive social emotional experiences* included the number of positive emotion words toward the self (e.g., love, happy, excited, joyful), and the number of negative emotion words toward self (e.g., afraid, nervous, fearful, sad, worried).

Themes of children's *belief in animal mind* included the number of emotion (e.g., afraid, nervous, happy, excited, fearful, sad, worried) and thought (e.g., believes, thinks, wants, desires, wonders) words in relation to animals, the number of references to animals by name for *belief in animal mind* (e.g., naming them), the number of references to human-animal similarity (e.g., "I would know - if the horse is sad - if he cried every night like I cry

every night", "I feel like animals can handle things better than humans, I think of them as actual human beings, they are the same, except they are animals"), as well as positive (e.g., "I love my horse Romeo", "I feel comfortable around the goat") and negative (e.g., "I was extremely scared of the horse", "I have always hated some dogs") feelings towards the animals.

The accuracy and trustworthiness of coding were ensured through independent reliability coding by two independent raters. During this process, the raters discussed the codes across 20% of randomly selected participant responses, and the percentage of inter-rater agreement ranged from 75% to 96% across both the *social emotional experiences* and *belief in animal mind* codes. Discordant codings were discussed to clarify perspectives and reconcile codings. For example, in the preliminary analysis there was some discrepancy about how to code the use of the word "nice", with one coder interpreting it as an expression of positive emotion. Following discussion both coders agreed that in this context the use of the word "nice" should be interpreted as a positive statement rather than as a positive emotion. Only emotions such as happy, sad and scared were considered expressions of positive emotions towards the self. Children's interview responses were also coded for total word count and proportionate codes were calculated by dividing the total number of words in each category by the total words overall to obtain a percentage of code for each category. For example, if a child's pre-program interview response included 10 *positive emotion words toward the self* and the total word count of their pre-program interview response was 100 words, then their *positive emotion word* percentage would be .10 or 10/100. Lastly, we explored the children's responses to uncover poignant quotes related to each of the themes noted above and to identify the program aspects (if any) linked with their positive experiences across the nine weeks.

Findings

In terms of supporting children's social emotional experiences and *belief in animal mind,* the after-school program was regarded as a positive experience for this group of children. The analyses revealed that children were overwhelmingly excited about starting the program, despite initially expressing that they were nervous or scared because of their lack of experience with and confidence in their ability to manage the horses.

The Quality of Children's Pre-to-Post-Program Social Emotional Experiences

Notably, for five of the eight children we observed either an increase in the use of positive emotion words toward the self and/or a decrease in the use of negative emotion words toward self (see Table 1).

Insert Table 1 here

A qualitative review of the children's responses supported the pre-to-post-program shifts noted above and showed that the program had a meaningful impact on the self-reported quality of social and emotional experiences of five children. For example, one child discussed how the program made her feel more confident, empathic towards their peers and positive about life and the future. The children reported that they felt better in terms of their emotions at the end of the nine-week program. One child stated that "I think of everything else like the horses and me riding and just… I feel like it's been making me feel better about myself, like making me feel better about how many fights I have gotten into and that I just push them away and don't really worry about it." Another child talked about the importance of the program in temporarily alleviating her negative mood in the following way: "It meant… really good to me… because well, it kind of changed because now I don't have like, well it's kind of hard to say but depression like I used to… but it's hard to explain why I am not now."

Finally, all the children emphasized the unique bond they had developed with either their horses or the other animals and how this made them feel excited and happy each week.

Children's Pre-to-Post-Program *Belief in Animal Mind*

Notably, for seven of the eight children we observed pre-to-post program increases in children's *belief in animal mind* (see Table 2). Two children showed an increase in their use of both emotion and thought words when discussing animals minds. Several children showed increases in either emotion or thought words only, with one child showing an increase in use of emotion words only and four children showing an increase in use of thought words only. Further, six children showed an increase in their use of names when referring to animals. Interestingly, for six of the eight children we observed a slight decrease in references to human-animal similarity (with one child reporting zero references at both the pre-and-post-program and one child showing a slight increase at the end of the program). Notably, three children showed both an increase in references to positive feelings and a decrease in references to negative feelings toward animals (including horses and wild, companion, and farm animals). Lastly, two children showed an increase in references to positive feelings and one child showed a decrease in references to negative feelings toward animals (note that one child did not show a noticeable shift in either positive or negative references toward animals; see Table 2).

Insert Table 2 here

A qualitative review of the children's responses supported the pre-to-post-program shifts noted above, with most of the children revealing a greater awareness of animals' emotions and thoughts and more positive and less negative feelings toward animals. For example, one child stated that "It definitely changed me and my love of horses. I definitely

have more compatibility with them [horses], and to understand their feelings and to like understand them and how they are thinking". Another child noted "I think all animals have feelings… whenever I am near animals, I know they have feelings and that they can get hurt too." Yet another child shared the following: "Yeah, it has changed my life I have learned how to groom and ride horses. It has kind of made me think, well I used to think farm animals didn't have any thoughts or feelings…now I do realize they do have thoughts and feelings." Finally, another child stated that "cause any animal, like it doesn't matter what animal it is… it would still have feelings, just like humans."

Program Aspects Linked with Children's Positive Experiences Across the Nine Weeks

The program was generally successful in engaging the children in positive experiences across the nine-weeks. When asked about which activities they liked the most and least about the program children referred to several surprising features of the program beyond their interactions with the horses and animals (see Table 3). More specifically, a qualitative review of the children's responses revealed the following themes as key aspects of their experience in the program: 1) *New opportunities and interest in the program,* 2) *New social opportunities and support,* 3) *Feeling more confident with horses and farm animals,* and 4) *Sadness that the program was ending.*

Insert Table 3 here

New Opportunities and Interest in the Program. When asked what aspects of the program (if any) the children thought might have contributed to their positive experiences, many of the children discussed the new and diverse experiences. Notably, the following program activities were highlighted as favorites among several of the children playing games and socializing with their school friends outside of school, being able to interact hands-on

with the farm animals, and the novel food and snack choices. The importance of these novel experiences is highlighted in the following quote, “It was a great opportunity and I spent every second loving it. I am more open to opportunities, and I will try new things. The food here is different from what I have, so they make me try new things, and that’s what I like.” It was clear that the children were feeling very positive about their experience in the program (e.g., I am happy to be here too, this is a big opportunity. Just to be able to get used to animals more, and to be able to see more animals”).

New Social Opportunities and Support. Most of the children stated the importance of having experienced new opportunities to connect with their school friends outside of the more formal school context. For example, one child stated that “Most of them [other children] are like very good friends, so now I got to know them, like if their family owned horses” The children also talked about the importance of experiencing new adult role models (the program coordinators). In this regard, one child stated that “I felt honored that [program organizer] … chose us. I don’t know why. She saw something in us, I guess. Potential, potential to become more than we are, which is really good with horses. Honored again, because they are seeing me for more than I am. Yes, it did change my life”. When asked about the aspects of the program that they enjoyed the most, one child stated that “I feel really happy and excited to get away from all my issues at home and school… [the program organizers] make us feel comfortable, because they give us food like I said, and they make sure that we are comfortable and if we are uncomfortable they comfort us.” Finally, another child noted that “[program organizer] is compassionate, and [program organizer] is funny. I would say to somebody who is nervous in starting these programs, don’t worry, trust me, I have experienced it, I was nervous, but you will get over it and you will have the best time of your life.” In some interviews emphasis was put on the staff’s ability to help them to solve

interpersonal conflicts as noted by one child “The [Program Organizer] comforts me when I’m sad, she makes people feel good and not upset and solves issues”.

Feeling More Confident with Horses and Farm Animals. Others stated that their favorite part of the program was the time that they spent with the farm animals and grooming and riding their horse. One child stated, “I would probably actually choose grooming because that’s where you get the closest to the horse, it’s just a lot of fun to be with them”. Another child expressed it in the following way: **“**My favorite part was probably riding because it’s like that’s what I’m here for. I’m not here to eat snacks, or just to like, I’m not here to just play around with my friends. I am here to learn about horses and to get educated about the animals and know what other animals are feeling and what types of species there are, I’m just here to learn, and here to ride.”

Some of the children felt more comfortable and less fearful of the farm animals at the end of the nine-week program as highlighted in this child’s quote, “Last time I said I didn’t really feel comfortable, but now I do feel much more comfortable cause the goat here I was extremely scared of Oreo [goat] but now Oreo and Daisy are used to me. I pet most of the donkeys, the horses the pig I haven’t yet, and I feel more comfortable around animals than I do people". Another child stated that “You just have to get to know them. Oreo is my favorite goat”. For other children, feeling nervous or scared around the horses was associated with fear of horses not liking them (e.g., I feel kind of nervous and worried because I am worried the horses may not like me”), whereas for others such feelings were related to a fear of being hurt (e.g., I’m very excited because like – I’m also scared that he horses are going to like hit me, but I’m not so scared that I won’t deal with them”).

Sadness that the Program was Ending. Finally, it should be noted that no child could easily identify a least favorite program activity, although two children referred to “mucking the stalls”! All of the children expressed sadness that their experience in the

program was ending and that they would miss the animals (e.g., “I am actually kind of sad, I wish it was for the whole year. But I am sad to leave Levi, Jackson and Romeo and other horses”, “I’m sure he loves me. Like with my dog kisses, and my cat, so I’m assuming with horses it’s the same thing, so it’s a sign of love”). Other children also noted that they would miss the special bonds they developed with their peers, the program organizers and the youth helpers.

Discussion

Children’s experiences in the program were overwhelmingly positive for this group of children who was referred to the program because they were living in socioeconomically disadvantaged homes. By exploring children’s responses to an unstructured program involving horses and a diversity of farm animals, this exploratory study addresses an important gap in the human-animal interactions literature which has, to date, focused mainly on understanding children’s structured experiences with horses (Melson, 2014).

All of the children in this study were equally excited and positive about starting the program and they were sad to see it end. This attests to the feasibility and overall positive impact of such a horsemanship and farm-based program for this important group of children who might otherwise not have the opportunity to experience the benefits of engaging with horses in structured equine-assisted contexts. Arguably, children’s feelings of excitement could have reflected the novelty of the program. However, references to positive feelings and excitement did not fade, but rather increased for most children by the end of the program. In this way, rather than merely reflecting the novelty of the program, children’s positive feelings seemed to be connected to their ongoing interactions with animals, peers and adults during the program.

An interesting study finding was that the program had a positive impact on the quality of children’s social emotional experiences. The children’s qualitative responses and, to some

extent, an analysis of their use of self-reported positive and negative emotion words towards the self revealed that the program offered an opportunity for meaningful social interactions and support which translated into positive feelings. The post-interviews indicated that this effect was associated with both the bonds children developed with their peers and with the animals program organizers. Participating in the program increased positive emotions, fostered self-confidence, and even eased one child's feelings of depression. Our findings are consistent with research indicating that when reflecting on their care farming experiences many people state that they value opportunities to be in contact with other people, and the feeling of a sense of achievement and belonging (Murray et al., 2019). Further, our findings are consistent with studies showing that a routine of care with the same animal can help to develop human-animal bonds (Hassink et al., 2017). In this study, the program organizers ensured that children interacted with the same horses and youth helpers across the nine-weeks, thus facilitating the development of social bonds between the children and the horses and the youth helpers. For the children in this study, these social bonds with their peers, the farm animals and other adults were associated with self-reports of positive feelings about themselves and the program. Note that all of the children expressed sadness that the program was ending, which might have negatively impacted their mood during the post-interview. In this way, the slight increase in self-reported negative emotions we observed for several of the children might be partially explained as a general (versus a self-directed) feeling of sadness.

Also, the children in this study underscored the importance of seeing their peers in the after-school program as this allowed them to explore other aspects of their relationships while enjoying experiences in a more relaxed environment. In this way, the opportunity to interact with their friends in a different context (outside of school) facilitated the formation of emotional connections among the group of children in this study, connections that might not be easily developed at school. Possibly, these emotional connections can enhance the quality

of their future school-based relationships. These types of social opportunities are essential to promoting children's positive social relationships. Relatedly, most of the children in this study developed emotional bonds with a diversity of animals in the farm. However, it is worth noting that these emotional bonds were often in reference to the horses, which likely reflects children's more frequent interactions with the horses and often with the same horse each week, as compared with the other farm animals.

Another important study finding is that several children showed increases in *belief in animal mind*, in terms of the use of either one or both emotion and thought words to discuss animal minds. In one study, Spanish primary school children's positive attitudes towards animals was associated with their beliefs in animals' ability to feel emotions but not with their beliefs in animal's thinking abilities (Menor-Campos et al., 2019). In contrast, in our study, children's positive feelings (albeit not attitudes) towards horses and farm animals increased for five children and these same children also showed an increase in the use of thought words when discussing animal minds (two of these children also showed an increase in the use of emotion words). In this way, children's *belief in animal mind* was connected to their positive feelings towards animals, and this finding supports previous studies emphasizing the positive effects of farm programs in creating a positive environment that facilitates the development of positive connections with animals (Hassink et al., 2017). However, future studies are needed that apply standardized measures to examine which aspects of children's *belief in animal mind* (i.e., emotions, thoughts) are linked to more positive feelings and attitudes towards and treatment of a diversity of animals.

When discussing animal minds in the post-interviews some of the children in this study highlighted differences, rather than similarities, in the way humans and animals are able to feel and express emotions (e.g., "I feel like animals have different feelings than us humans, because I don't think that animals can cry"). This finding was at first surprising

since we expected to observe increases in human-animal similarity in children's responses, but still these answers reflect an understanding of the animal 'ability to think and feel (Hawkins & Williams, 2016). It is also possible that knowledge about and direct contact with farm animals stimulated the development of a more complex and biocentric (versus anthropocentric) understanding of animal minds (Melson, 2014; Ruckert, 2016). Anthropocentric reasoning is human-oriented and characterises children's thinking when an animal is valued only in terms of its appeal or benefits to humans, whereas biocentric reasoning is nature-oriented and characterizes children's thinking when an animal is thought to hold intrinsic value independent of its appeal or benefits to humans (Melson, 2014). In this study, however, we did not probe children's responses in this way and future research is needed to examine the role of children's experiences with animals in such a program and their tendency to adopt anthropocentric or biocentric language when discussing animal minds.

Anecdotally, our findings underscore the importance of youth helpers as they often adopted the role of translator between horse and child and helping them to ride and learn to communicate with the horses in ways that would minimize reticence and/or shyness around the horses. This observation is consistent with the results of a recent study suggesting that equine assisted learning facilitators can play an important role in helping youth riders to down regulate physiological and affective arousal before mounting sessions, with the goal of preventing and redirecting negative emotion and behavior both during and after dismounting (Pendry, Carr, & Vandagriff, 2018). Future research is needed that examines more carefully the role of youth helpers and equine facilitators in shaping the quality of children's experiences with horses and other animals in both equine and farm-based programs.

Overall, our research findings suggest that participation in an after-school horsemanship and farm-based after-school program can positively impact children's social

549 and emotional experiences and their thinking about animal minds. This study has some
550 important strengths. First, to the best of our knowledge this is one of the first studies to show
551 that children's experiences with horses and farm animals in a relatively short (nine-week)
552 unstructured program can strengthen the quality of children's relationships with their peers
553 and enhance their *belief in animal minds*. Second, understanding the impact of children's
554 unstructured experiences with a diversity of animals has important implications for
555 educational policy. This study's findings are important and timely given the recent influx in
556 educational efforts to expose young children to wild and farm animals through media
557 sources, nature activities and visits to farms, zoos, and aquariums (Rocha et al., 2016; names
558 withheld to protect anonymity of review, 2015). In terms of practical implications, this
559 study's findings support the need for educational efforts to incorporate a special focus on
560 different types of animals since the children in this study connected meaningfully with the
561 horses and other farm animals. In this way, children would be given opportunities to
562 generalize the knowledge they acquire in a farm-based context to their experiences at home
563 with their companion animals and vice versa. Further, our study findings can inform
564 educational policy and the development of educational strategies to support children's
565 understanding of animal minds and their concern about the welfare of a diversity of animals
566 (Ruckert, 2016; Melson, 2014; names withheld to protect anonymity of review, 2019). Lastly,
567 it is often more feasible and cost-effective to organize visits to farm-based contexts and to
568 facilitate children's less structured experiences with horses and a diversity of farm animals,
569 as compared with organizing and overseeing children's participation in more structured
570 equine-assisted programs. In this way, farm-based contexts are also accessible to a greater
571 proportion of children and youth, particularly those whose family's economic circumstances
572 might exclude them from opportunities to experience the benefits of engaging with horses in
573 structured equine-assisted contexts.

Limitations and Future Directions

There are several limitations of this exploratory study that must be noted. First, the total number of children in our study was relatively low and our findings, especially our numerical pre-to-post-program findings, are to be interpreted with caution. We were careful not to overinterpret these findings and we relied on the children's qualitative interview responses for a more complete interpretation. Further, the findings stemming from our careful tracking of pre-to-post-program shifts in the quality of children's social emotional experiences and *belief in animal mind* add to the growing body of literature that has often employed a small case study approach to documenting more personalized experiences in farm-based programs among children and youth (Ferwerda et al., 2012; Kogstad et al., 2014; Pedersen et al., 2012; Schreuder et al., 2014). Further, we used a convenience sample of children living in homes facing socioeconomic disadvantage, and it is possible that this group of children was already positively inclined towards horses and farm animals. If this was the case, then it is possible that participation in a relatively short nine-week horsemanship and farm-based program might not lead to meaningful shifts in the quality of social and emotional experiences and *belief in animal mind*. However, as noted previously, most of the children did not report having prior experience with horses or farm animals, but yet some meaningful post-program shifts were noted in children's self-reports of the quality of their social emotional experiences and *belief in animal mind*. This observation underscores the effectiveness of this type of farm-based program for this group of children. Nevertheless, future research is needed to better understand how children's age, gender, socioeconomic and ethnic diversity, and current and past relationships with companion animals at home might differentially impact their experiences in such a program.

Second, to determine the impact of the program on children we relied uniquely on children's self-assessments which might have been skewed to reflect current life events.

Also, the children might have felt a need to provide socially desirability because they were receiving access to the program each week. Moving forward, future studies should adopt a triangulated approach to capture the views of multiple informants (e.g., interviews with parents or teachers, focus-group discussion, observations of children's behaviors) and standardized measures to more extensively document how participation in such a program might impact children's social emotional experiences with a direct focus on mental health outcomes, and their *belief in animal mind*.

Third, another potential study limitation involves the analysis of children's interview responses to uncover children's thinking about their social emotional experiences and about animal minds. However, we suggest that a careful analysis of children's use of psychological language and mental state terms is an innovative and useful technique to expand our understanding of how children mentally represent the quality of their social and emotional experiences and the nature of animal minds (e.g., names withheld to protect anonymity of review, 2019). Also, this approach was useful in highlighting the subtle nuances and shifts in young children's thinking about animal minds and the social and emotional complexities of their experiences over the course of the nine-week program.

Finally, we do not know the extent to which the subtle shifts reported by the children in relation to their social emotional experiences and *belief in animal mind* will be retained across a longer time period. Clearly, we might expect to observe some subtle shifts in children's responses after their participation in a nine-week program, however this exploratory study represents a first step in empirically documenting such shifts from the children's perspectives. Future longitudinal research is needed to explore whether these shifts persist (e.g., one month, six months) and the developmental impact of these shifts. Additionally, future research is needed to examine if and how the subtle shifts we observed in children's thinking about the complexity of animal minds might translate into more positive

feelings, attitudes and treatment toward animals, and to greater moral concern for the welfare of animals.

Conclusion

In our view, this exploratory study addresses an important gap in the literature by elucidating children's unique perspectives of their experiences within the context of a nine-week horsemanship and farm-based program. This study's findings suggest that children's interactions with horses and farm animals might strengthen their social emotional experiences and expand their thinking about animal minds. Practically, this study's findings have the potential to encourage researchers, educators and community-based program leaders to incorporate virtual and/or in-person field trips to the farm and to develop classroom visitation programs, and to incorporate discussions about animal minds. Such programs have the potential to support and strengthen children's social and emotional well-being and to stimulate children's knowledge of and respect for the minds and needs of a diversity of animals. Overall, we believe that this study provides a unique and meaningful contribution to the expanding research examining the impact of children's unstructured interactions with horses and/or farm animals on the quality of children's social emotional experiences and *belief in animal mind*.

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Table 1

Percentages from Pre-to-Post Program in Children's Self-Reported Positive and Negative Emotion Words Toward the Self

	Child 1		Child 2		Child 3		Child 4		Child 5		Child 6		Child 7		Child 8	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Positive Emotion Words – Self	1.62	1.69	1.09	0.19	0.77	**1.14**	0.86	0.47	0.26	**0.60**	0.47	0.48	0.35	**0.62**	0.80	0.60
Negative Emotion Words – Self	0.62	0.96	1.09	**0.48**	0.62	0.85	0.93	**0.81**	0.66	0.95	0.47	0.63	0.46	**0.18**	0.27	0.90

Note: Post-program shifts in the anticipated direction are bolded.

Table 2

Percentages from Pre-to-Post Program in Children's Belief in Animal Mind Across Six Categories

	Child 1		Child 2		Child 3		Child 4		Child 5		Child 6		Child 7		Child 8	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Emotion Words	0.87	**1.93**	0.31	0.29	1.39	1.28	0.43	0.34	0.39	**0.59**	0.47	**0.95**	0.69	0.62	0.80	0.70
Thought Words	0.12	**1.21**	0.47	**0.86**	0.46	**1.14**	0	**0.27**	0.33	**0.48**	0	0	0.11	0.08	0.27	**0.40**
Refer to Animals by Name	0.37	**0.72**	0	**0.09**	0	**0.71**	0.07	0.06	0.19	**0.36**	1.08	0.63	0.23	**0.98**	0.71	**1.09**
Human-Animal Similarity	0.12	0	0.31	0.09	0	0	0.21	0.13	0.06	**0.11**	0.47	0.15	0.46	0.27	0.18	0
Positive Feelings – Animals	0.12	**0.72**	0.93	0.48	0.62	**0.85**	0.36	**0.61**	0.19	**1.07**	0.31	0.31	0.81	0.36	0.18	**0.80**
Negative Feelings – Animals	0.25	0.48	0.15	**0**	0.15	**0**	0.07	**0.06**	0.26	**0.11**	0.93	**0**	0	0.27	0.08	0.09

Note: Post-program shifts in the anticipated direction are bolded.

Table 3

Most commonly reported themes for questions related to children's most and least favorite activities in the program

Question	Response Rate (%)	Dominant Themes (*n* = number of responses)	Percentage of Child Respondents % (*n*)
What was your most favourite activity in the program?	100%	Riding	75% (6)
		Grooming	25% (2)
		Playing games	255% (2)
		Being with friends outside of school	25% (2)
		Food	25% (2)
		Everything	12.5 % (1)
What was your least favourite activity in the program?	100%	Cleaning stables	50% (4)
		Snacks	12.5% (1)
		Cleaning hooves	12.5% (1)
		Tacking/Grooming	12.5% (1)
		Nothing! I liked everything!	12.5% (1)

Note: Descriptions of dominant themes are provided in the text.