

From Horses to Robots: Enhancing Participant Mental Health Through Embodied Emotional Attunement

Ellen Weir
ellen.weir@bristol.ac.uk
University of Bristol
Bristol, UK

Abstract

This work explores how insights from equine-assisted interventions (EAIs) can inform the design of therapeutic robots. EAIs foster emotional regulation, empathy, and non-verbal communication but face accessibility challenges due to logistical and financial constraints. Through an autoethnographic study, this research examines human-horse attunement, highlighting reciprocal emotional regulation and non-verbal interaction. Horses act as co-regulators, challenging robotic design paradigms that prioritise obedience. By positioning horses as a model for therapeutic robots, this work proposes a framework for embodied, responsive robotic systems that foster trust, engagement, and emotional connection, contributing to the future of interactive health technologies.

Keywords

Equine-Assisted Interventions, Robot Design, Autoethnography, Human-Animal Interaction, Mental Health and Well-being, Animal Therapy

ACM Reference Format:

Ellen Weir. 2025. From Horses to Robots: Enhancing Participant Mental Health Through Embodied Emotional Attunement. In *Proceedings of CHI '25 Workshop on Envisioning the Future of Interactive Health*. ACM, New York, NY, USA, 3 pages.

1 Introduction

Over the last 70 years, equine-assisted interventions (EAIs) have gained increasing recognition as a therapeutic approach that leverages the unique sensitivity of horses to human emotional and non-verbal cues. Defined as “interventions that involve a live horse, for humans of any age, and for any therapeutic purpose” [17], EAIs facilitate emotional and psychological well-being by fostering a dynamic, attuned relationship between humans and horses.

As prey animals [3], horses have evolved highly sensitive mechanisms for attuning to the energy and intentions of others [11]. They respond dynamically to human emotional states, interpreting non-verbal cues such as body language, facial expressions, and movement [6, 13, 15].

Participants are often referred to EAIs when conventional talk-based therapies prove ineffective [7]. Many individuals who struggle with emotional articulation or have experienced trauma find

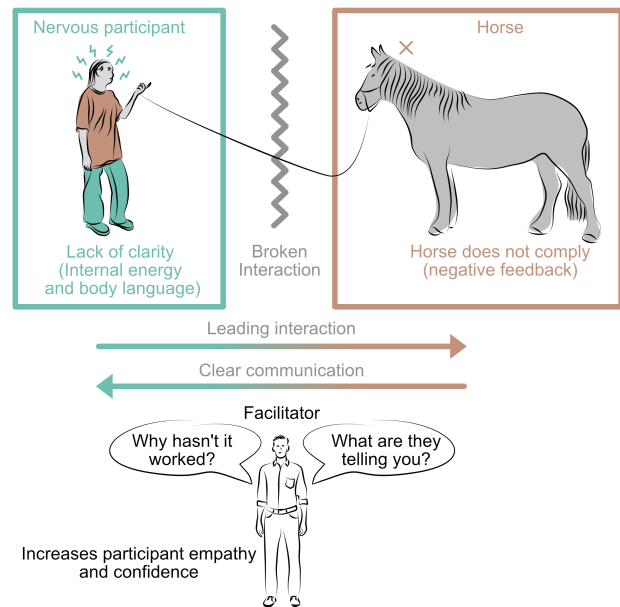


Figure 1: Increasing Participant-Horse Attunement over the Course of EAIs. This diagram illustrates the initial phase of disjointed interaction between the nervous participant trying to lead the interaction and the horse, who will not comply with the unclear request. This negative feedback, made clearer with the facilitator’s guidance, leads the participant to become more aware and empathetic of how their non-verbal cues are affecting the horse, allowing for an adjustment and an increase in clarity between the partners.

that traditional therapeutic approaches do not adequately address their needs [2, 19, 20].

EAIs offer an alternative, experiential form of therapy that fosters non-verbal communication, self-regulation, and emotional resilience [16]. In EAIs, participants learn to communicate non-verbally with horses through body language and emotional regulation [8]. The trained horses used in these interventions excel at engaging participants in ‘games’ that foster communication through energy and movement rather than verbal commands or physical force [8]. Participants must remain constantly aware of their own emotions, their surroundings, and the horse’s responses, while the horse evaluates them for potential threats [5]. Trained horses also establish clear boundaries when discomfort arises [12], prompting participants to adjust their energy, emotions, and actions in response [21].

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).

CHI '25 Workshop on Envisioning the Future of Interactive Health, Yokohama, Japan
© 2025 Copyright held by the owner/author(s).

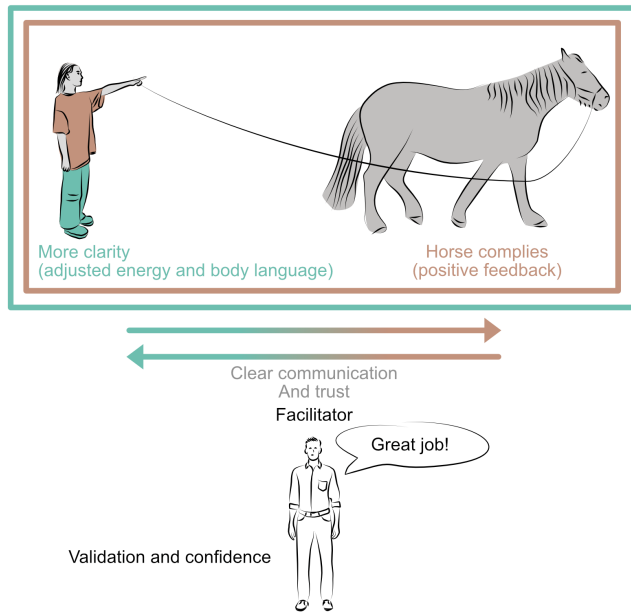


Figure 2: The Unification of Horse and Participant in Equine-Assisted Interventions. This diagram illustrates the process by which the horse and participant become more attuned. As the participant demonstrates clearer body language, energy, and assertive leadership, the horse better understands what is being asked. The horse responds with positive feedback by complying with the request, reinforcing the effectiveness of non-verbal communication. This reciprocal interaction enhances trust and attunement, with the facilitator mediating to validate the participant's efforts and affirm their progress.

Despite these benefits, EAIs face significant barriers to widespread implementation, requiring substantial financial and logistical resources. Furthermore, the scarcity of EAI centres, particularly in rural and underserved areas, restricts access for many potential participants [18].

One potential avenue for addressing this challenge lies in the integration of technology. Embodied robotic systems, designed to replicate key elements of human-animal interaction, could provide scalable and accessible therapeutic alternatives. However, while robotic therapies have been explored on a small scale, existing systems lack the capacity to engage users in the type of reciprocal, embodied interactions that characterise EAIs. Moreover, the ethical and psychological implications of replacing sentient beings with machines remain underexplored [10, 14].

This work explores how the mechanisms underpinning human-horse interactions in EAIs can inform the design of therapeutic robotic systems. Inspired by Jain and Gardner-McCune's [10] conceptualisation of horses as *"the holy grail for co-bots and social robots,"* this work examines how the principles of non-verbal, dynamic, and reciprocal interaction in EAIs can translate to human-robot interactions (HRIs). Through an autoethnographic study of an EAI, I investigate how embodied attunement, co-regulation, and the negotiation of leadership roles contribute to therapeutic outcomes,

providing insights into the development of more responsive and emotionally attuned robotic systems.

2 CHI2025 Study

To investigate the mechanisms underpinning EAIs, I conducted an autoethnographic study [9] while participating in an EAI programme. This method provided direct, introspective insights into the cognitive and emotional processes involved in human-horse attunement, allowing for a nuanced exploration of the therapeutic experience [4].

The findings of this study challenge the notion that horses function merely as passive therapeutic tools. Instead, they act as autonomous participants in a process of emotional co-regulation. Effective interaction within EAIs requires a fluid negotiation of leadership: excessive control prompts resistance, while passivity leads the horse to assume dominance. This dynamic exchange produces emotional meaning relationally, with agency distributed across both human and non-human bodies [1].

By extending these insights to human-robot interaction, this work proposes a rethinking of robotic agency in therapeutic contexts. Rather than designing robots as subservient entities, this research advocates for systems that engage in dynamic, co-regulatory interactions with users. Such an approach has the potential to enhance the effectiveness and ethical viability of therapeutic robotics, ensuring that these systems foster genuine connection and engagement rather than passive compliance.

3 Future Objectives

This research aims to identify the core mechanisms driving the positive psychosocial outcomes of EAIs and translate these insights into the design of therapeutic robotic systems. By understanding how humans and horses engage in reciprocal, non-verbal interactions, this work seeks to enhance the accessibility and scalability of therapeutic approaches, addressing the growing demand for alternative mental health interventions.

As Jain and Gardner-McCune conceptualised in their 2023 CHI paper, the framing of horses as teammates, companions, and co-workers represents a *"holy grail for co-bots and social robots"* [10]. Building on this perspective, this research positions horses as a model for therapeutic robots, proposing a shift from compliance-driven robotic design towards systems that engage in dynamic, co-regulatory interactions with users.

Although small-scale, animal-inspired robotic therapies exist, the development of large-scale, embodied robots capable of real-time, affective interaction remains a significant challenge. Such systems must interpret human emotions through body posture analysis and generate movements that foster a genuine sense of connection. The integration of large-scale, soft robotic systems presents a promising avenue, offering the potential for non-verbal, intuitive communication that mirrors the responsiveness of horses. By leveraging empirical insights from the human-horse bond, this research contributes to both therapeutic intervention design and human-robot interaction (HRI).

Future work must also address the ethical implications of replacing sentient beings with machines, particularly in relation to the emotional and psychological impact on participants [10, 14]. A



Figure 3: The left image depicts a participant and horse at an equine-assisted intervention (HorseCourse), engaging in reciprocal, non-verbal communication to attune their affective states and build a shared understanding. The right image shows members of the public interacting with LUMA, a giant inflatable, soft robot created by Air Giants, demonstrating how large-scale robots can foster emotional connection and responsive interaction. This comparison highlights parallels between the intuitive, embodied dynamics of human-horse interactions and the potential for therapeutic human-robot interactions.

key question remains: can robotic substitutes truly replicate the trust, empathy, and dynamic feedback provided by living animals? Exploring whether therapeutic robots can complement, rather than replace, EAs is essential for ensuring that technological interventions enhance, rather than diminish, the depth and effectiveness of therapeutic experiences.

References

- [1] Karen Barad. 1996. Meeting the universe halfway: Realism and social constructivism without contradiction. In *Feminism, science, and the philosophy of science*. Springer, 161–194.
- [2] L Elisabeth Burton, Fares Qeadan, and Mark R Burge. 2019. Efficacy of equine-assisted psychotherapy in veterans with posttraumatic stress disorder. *Journal of integrative medicine* 17, 1 (2019), 14–19.
- [3] Janne Winther Christensen, Linda Jane Keeling, and Birte Lindstrøm Nielsen. 2005. Responses of horses to novel visual, olfactory and auditory stimuli. *Applied Animal Behaviour Science* 93, 1-2 (2005), 53–65.
- [4] Bohkyung Chun. 2019. Doing autoethnography of social robots: Ethnographic reflexivity in HRI. *Paladyn, Journal of Behavioral Robotics* 10, 1 (2019), 228–236.
- [5] Elizabeth Dampsey. 2017. *The effects of equine-assisted psychotherapy on emotion regulation: Self-efficacy and self-awareness as potential mediators*. Ph.D. Dissertation. Fielding Graduate University.
- [6] Martine Hausberger, Hélène Roche, Séverine Henry, and E Kathalijne Visser. 2008. A review of the human–horse relationship. *Applied animal behaviour science* 109, 1 (2008), 1–24.
- [7] Ann Hemingway. 2019. A study exploring the implementation of an equine assisted intervention for young people with mental health and behavioural issues. *J 2*, 2 (2019), 236–246.
- [8] Ann Hemingway and Kezia Sullivan. 2022. Reducing the incidence of domestic violence: An observational study of an equine-assisted intervention. *Family process* 61, 2 (2022), 549–570.
- [9] Sherick A Hughes and Julie L Pennington. 2016. *Autoethnography: Process, product, and possibility for critical social research*. Sage Publications.
- [10] Eakta Jain and Christina Gardner-McCune. 2023. Horse as Teacher: How human-horse interaction informs human-robot interaction. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–13.
- [11] Kathleen Kemp, Tania Signal, Helena Botros, Nik Taylor, and Kathy Prentice. 2014. Equine facilitated therapy with children and adolescents who have been sexually abused: A program evaluation study. *Journal of child and family studies* 23 (2014), 558–566.
- [12] H. Laurie and J. Noble. 2015. Evidence Reviews Theory of Change and Contribution Analysis. TheHorseCourse.
- [13] Katrina Merkies and Olivia Franzin. 2021. Enhanced understanding of horse–human interactions to optimize welfare. *Animals* 11, 5 (2021), 1347.
- [14] Florence Roberts, Judy Bradberry, and Cheryl Williams. 2004. Equine-facilitated psychotherapy benefits students and children. *Holistic nursing practice* 18, 1 (2004), 32–35.
- [15] Agnieszka Sabiniewicz, Karolina Tarnowska, Robert Świątek, Piotr Sorokowski, and Matthias Laska. 2020. Olfactory-based interspecific recognition of human emotions: Horses (*Equus ferus caballus*) can recognize fear and happiness body odour from humans (*Homo sapiens*). *Applied Animal Behaviour Science* 230 (2020), 105072.
- [16] Nikki Savvides. 2012. Communication as a solution to conflict: Fundamental similarities in divergent methods of horse training. *Society & Animals* 20, 1 (2012), 75–90.
- [17] Fiona Seaman-Thornton. 2020. *Exploring change processes in an equine-assisted intervention*. Ph.D. Dissertation. Canterbury Christ Church University.
- [18] Mark Shucksmith, Jayne Glass, Jane Atterton, and Polly Chapman. 2023. *Rural poverty today: experiences of social exclusion in rural Britain*. Policy Press.
- [19] Alexa Smith-Osborne and Alison Selby. 2010. Implications of the literature on equine-assisted activities for use as a complementary intervention in social work practice with children and adolescents. *Child and Adolescent Social Work Journal* 27 (2010), 291–307.
- [20] Eleanor White, Jaclyn Zippel, and Saravana Kumar. 2020. The effect of equine-assisted therapies on behavioural, psychological and physical symptoms for children with attention deficit/hyperactivity disorder: A systematic review. *Complementary therapies in clinical practice* 39 (2020), 101101.
- [21] Jan Yorke, William Nugent, Elizabeth Strand, Rebecca Bolen, John New, and Cindy Davis. 2013. Equine-assisted therapy and its impact on cortisol levels of children and horses: A pilot study and meta-analysis. *Early child development and care* 183, 7 (2013), 874–894.