Chapter 9
Emotional Intelligence and Empathy in Human-GenAI Interactions

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ABSTRACT

The integration of emotional intelligence and empathy into Generative Artificial Intelligence (GenAI) systems is transforming human-technology interactions, raising critical questions about the capabilities, limitations, and ethical implications of emotionally responsive AI. While human emotions are deeply rooted in neural circuits involving the amygdala, prefrontal cortex, and insular cortex, AI lacks the intrinsic experience and biological basis to genuinely feel emotions. Instead, AI models attempt to simulate emotional intelligence through sentiment analysis, affective computing, and machine learning algorithms that analyze human expressions, speech, and physiological signals. These technologies enable AI to recognize and respond to emotional cues, creating interactions that feel more natural and engaging. However, challenges persist in accurately interpreting complex emotions, understanding cultural and contextual nuances, and ensuring fairness in emotion recognition.

1. INTRODUCTION

Generative Artificial Intelligence (GenAI) has ushered in new possibilitis of communications, creativity and decision makings by people and machine. Unlike the traditional AI systems based on formulation of rules and structured data, GenAI

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models can learn to generate human-like text, images, and speech in a dynamic and intuitive fashion (Ooi et al.2025). These technologies have become part of personal (e.g., chatbots, virtual assistant), educational (e.g., decision support systems), and professional (e.g., online course recommendations) practices. As emotional intelligence and empathy become more ingrained in everyday life, a question that becomes important is how can emotional intelligence and empathy be meaningfully reflected in Human GenAI interactions?

The ability to recognize, understand and respond to emotions, or emotional intelligence, contributes greatly to the success of human relationship and communication. Closely related to emotional intelligence, empathy entails the ability of one to perceive and resonate with the emotional states of others (Zhou et al. 2024). Such characteristics in human interactions develop confidence, mutual understanding and benefit the emotional health. But in the field of artificial intelligence, emotional intelligence and empathy are still not attainable, as AI is not really experiencing things subjectively and emotionally. However, the problem is to create GenAI systems that can replicate these human characteristics in such a way that they are natural, ethical, and beneficial to the user (Saikia et al. 2024).

This chapter looks into aspects of emotional intelligence ('EQ) and empathy in the context of GenAI, which includes identifying opportunities and limitations, and addressing ethical issues. Questions to be explored in this discussion comprise the ability of GenAI to replicate emotional intelligence and empathy, as well as what psychological and ethical issues arise from such advancements. In essence, the document raises questions about the trustworthiness of AI systems, if AI is designed to recognize and respond to human emotions. Can they genuinely improve human well being or do they pose themselves as a possibility for intense false or even manipulative relationship? It is crucial to address these concerns to assure that AI driven interactions facilitate nor degrade human agency and emotional health.

This chapter is structured in this way in order to provide a comprehensive analysis. The next section goes onto define emotional intelligence and empathy conceptually, to understand their definitions, the reasons they have been emphasized, and their psychological underpinnings. Next, the technological advances allowing AI systems to detect and learn to mimic emotional subtleties, such as NLP, sentiment analysis, and affective computing for AI are covered in this chapter. Next, the discussion covers real world applications where emotionally intelligent and empathetic GenAI systems are being used for applications in healthcare, education, and is going to look into customer service. Although such systems have the potential to be a leap forward, these advancements will also be critically considered in terms of the ethical and psychological risks involved, such as bias, emotional deception, and privacy concerns. The chapter concludes finally with a look to the future, calling for responsible AI development that involves transparency, fairness and human well