Chapter 17
Role of Emotions in the Interaction Between Humans and Artificial Agents

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ABSTRACT

In this era of technological advancement, the once-clear distinction between human intelligence and artificial intelligence is becoming blurred. From Google's search engine to Alexa, artificial intelligence has captured many aspects of our lives. With the involvement of robots and artificial intelligence in our lives, one needs to ponder upon the implications of human-robot interactions and understand artificial intelligence better as robots are becoming a significant part of our living and working alongside humans, especially in the health care domain. This gaining dependability of humans on robots poses a question: can such a 'care Bot' really care without having genuine emotions? Can we distinguish between robots and humans? Can human interaction with robots be the same as human-human interaction? The concept that weaves humans together is the concept of 'trust'; does this concept prevail in human-robot relationships? Can the active participation of robots in society make them social robots? Can we call them social robots?

INTRODUCTION

The emergence of the robotics industry, observed by Bill Gates, is developing in much the same way that the computer business did 30 years ago (Gates, Bill. 2007. A robot in every home. *Scientific American 296(1)* (January): 58-65). Various studies have claimed that robots in society will be like computers in years to come. The advancement of technology gives rise to multiple challenges, such as job displacement, privacy concerns, security fears, and many more. Earlier robots were supposed to perform

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unwanted, dull, or dangerous tasks; with technological advancements, robots are becoming integral parts of society by performing a wide range of roles efficiently, especially in the medical and healthcare sectors. For instance, toy-like robots such as PARO, which looks like baby seal, are designed for therapeutic purposes, such as reducing stress, stimulating cognitive activity, and improving socialization. Unlike real seal animals, the PARO robot cannot be hurt. Broadly speaking, these artificial systems exist for a variety of different tasks and play a crucial role in reducing stress and loneliness among human beings. Robots are also widely used to care for older people and children. As artificial intelligence advances, we can expect robots to play a more complex and broader range of societal roles. They are now impacting human lives by providing support in various domains. However, the full benefits of robots and other types of automation can only be realized if the appropriate use is made for them. The chapter aims to unfold the crucial role that emotions play in human life; moving forward, we will dive deep into the position of emotions in artificial artifacts. While trust, collaboration, and coordination are often cited as critical factors in reliance on automated assistance, the present chapter intends to understand human-human interaction to be compatible with human-robot interaction. Is this human-robot interaction transforming robots into social robots? The direct empirical comparisons between equally capable humans and robots have yet to be evaluated. The first part of the chapter unfolds the question of what emotions are and their role in human and robot life. In the second part of the chapter, an attempt is made to ponder the role of trust in human-robot interaction. The third part is primarily concerned with the social aspect of robots; the prime concern in this part is to understand whether robots' interaction with human beings helps them develop social skills.

I. EMOTIONS IN HUMAN LIFE

Exploring emotions is a concept that has been introduced previously; interest in emotions has a much older history, dating back to the Upanishads, the Buddhists, Confucius, and the Taoists in Asia, and Plato and Aristotle in Western philosophy. Emotions are a defining characteristic of the human condition and, thus, play a central role in human development, decision-making, and well-being. All intelligent creatures that we know of have emotions. Humans are the most expressive, emotionally complex, and socially sophisticated (Darwin, 1872).

Emotions are tremendously valuable sources of insight and energy. In current science, with its fascinating emphasis on neurology and the structure and processes in the brain, an emotion is primarily defined as a very short-term episode. Emotions can be produced just as much by the recall of reinforcing events as by external reinforcing stimuli (Treves & Rolls, 1994; Rolls & Deco, 2002). Philosophers say that emotions have an 'object' in the world and that emotional states are intentional, as they are about something. For instance, fear is produced by the sight of a stimulus that is about to produce pain. It refers to the state of mind that does not remain constant; emotions can be understood as dispositions, as we have witnessed multiple emotions at different points in time. For a better understanding of our emotions, we can refer to the metaphor of clouds, as clouds in the sky forming different patterns and images; some are big in size, some are small, and some can easily be identified; similarly, are our emotions; floating and changing like moving clouds in the sky, can be observed, flows by and disappear.

At times, the intensity of our emotions is so high that there is a chance of getting stuck in the loop of emotions. To get rid of this emotional loop, one must develop the capability to separate the previous experiences from the present; one must channel certain skills that help in equipping a person with the