Emotions and Information Processing: A Theoretical Approach

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ABSTRACT

An animate system standing in nature and trying to investigate its surroundings for different purposes does a type of cognitive processing. Emotions as mental states are leading human cognitive features that attract life by interactions processed in the world. This paper examines how this cognitive feature process works. By researching history and theories related to emotions and their generation, it becomes clear that information processing is discussed as a tool for their processes. Three different styles of information processing are evaluated for emotional processes. The pragmatic notion of information processing fits as a processing tool in modeling emotions and artificial emotions and explains the emotional process.

Keywords: Emotional Processing, Emotions, Information Processing, Mental States, Notions of Information

INTRODUCTION

While there is currently a big trend and great deal of interest in unpacking states of human mindful actions, behaviors, and cognitive processes, roughly and terminologically called mental states, scientists and philosophers have long been engaged in debates about the fundamental questions regarding the nature of those states. To clarify the nature of such states specialists need to have a theory (or theories) to pin them down ontologically and epistemologically. Mental states are entities which are clarified by different viewpoints. They have no precise definitions and mostly are clarified by their characteristics (and I do not want to define them here). By “states of mind” or “mental states” I mean something like desire, fear, sadness, embarrassment, jealousy, pride, calm, pain and so on.

Mental states like fear, jealousy, envy, anger, grief, indignation, enjoyment, embarrassment and etc. are classified under a title called “Emotion” 1. They, as well as other mental states, are generated in living animals under the effects of environmental events; they make living animals react to events and they are causes of some other actions and behaviors. They make belief and desire for a person; a person can believe that a risen emotion is because of an event. In addition, emotions correlate by brains states and could be conscious or unconscious.

Historically, Hume focuses on “agency” in emotions and Spinoza thinks emotions are bodily changes and have significance on our...
actions (De Sousa, 2010). Descartes (1649) says we need to distinguish functions of them from the body to understand what they are. In short, historical definitions are surrounded by dualist⁶ and monist⁷ views which behaviorism⁸, also, can play role in them.

In recent definitions we face with emotions which are considered as psychological states or process. Emotions have functions which are to manage goals of a human being (Wilson, 1999). Some others think that emotions are psycho-physiological response (Watson & Clark, 1994) and are inferred complex sequence of reactions to a stimulus (Plutchiks, 1982). And also they need cognitive evaluation.

The James-Lange and the Cannon-Bard as physical theories claim that emotions are caused by changes in physiological conditions relating to the autonomic and motor functions. According to the James-Lange theory, emotions are the labels we give to the way the body reacts to certain situations. And feeling aspect of an emotion is the perception of the body’s actions and physiological arousal. The James-Lange considers and generates emotions mechanically. It is merely physiology that causes emotions and there is no any rationality in it. While The Cannon-Bard theory believing that an emotion is the result of one’s perception of their reaction, or “bodily change,” steps a little forward and claims that appraisal is also important; we need to evaluate the events and situations too.

In contrast, cognitive experience of an emotion is independent of physiology, even though the cognitive experience occurs at the same time as the action. The Schechter-Singer Theory, as an outstanding cognitive theory of emotions, says that physiology is a necessary condition of emotions, but not enough. That is, emotions have cognitive appraisal aspects and cognitive processes, such as learning and thinking. However, due to cognitive theories, the difference between emotions is in their cognitive appraisal aspects. It means emotions relate to the events in the world and are functions of a person or an agent who accomplishes cognitive appraisal of the stimuli.

To experience an emotion, it might be physiological processes, or perceptions of physiological processes, or neuro-psychological states, or adaptive dispositions, or evaluative judgments, or computational states, or even social facts or dynamical processes; whereas having an emotion is both a mental and physiological state associated with a wide variety of feelings, thoughts, and behavior. Comprehensive, cognitive approaches not only are atten-
tive to body-based and physiological attitudes but also are sensitive to cognitive properties of mental states. That is, relationships between activation and causes of emotion, its structure and components, its learning processes and also its functions or consequences have to be considered. Evaluating these cognitive processes and their components either in living or nonliving systems depends on paraphrasing the emotional process using the notion of “information processing”. It might help us to solve not only the above disproportion in physical or cognitive approaches but also the problem of rationality (i.e. reasonableness and justification) of emotions. It also would help us in the problem of propositional attitude³ and how-to model emotions⁶. Thus, the next step is to look for the concept of information processing and compare them and their role in emotions.

Information Processing

Evidently, we cannot understand a society (world) unless we understand its way of dealing with information. Our fundamental concepts for describing the world are space, time, matter and order (MacFarlane, 2003). We describe the world by two parallel properties which may call Pattern and process. Pattern characterizes order as it manifests itself in terms of invariance under transformations of matter in space. Process characterizes order as it manifests itself in terms of invariance under transformations of matter in time (MacFarlane, 2003). In our interactions with the world, we have to deal also with two types of entities that behave in very different ways. One kind is essentially passive
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