Abstract—This literature review on the research of embodied emotion addresses the aspects of the concepts of embodied emotion, the various theories or theses on the embodied emotion abroad and at home, some comments based on the literature are elicited and the discussions about the future research topics on embodied emotion are proposed.

Index Terms—Cognition, embodiment, emotion.

1. Introduction

Discussion on emotion is an interdisciplinary research topic. The literature review found that with diachronic division of the cognitivism, the emotion-related exploration experienced the conversion from the perspective of disembodiment to embodiment. With the renewal of the concept of cognitive view in the post-cognition era, the study of the embodied emotion becomes a new orientation. Embodied emotion research is exploring the embodiment of emotion, from the definition confirmation to the theoretical thesis and empirical tests, and finally to the applications in practices. Therefore, the research topics are various and the research paths are omni-directional.

Human beings not only have the most developed intelligence, but also have the richest emotion, so the study of emotion is ever-new. The word “emotion-feeling” in Chinese is actually a comprehensive conceptual expression, which umbrellas all the English positive and negative terms as “fear, inertia, grief and depressions, dread and anxiety, anger, shame, hatred, and of course the complexities of love, desire, lust, jealousy, need, compassion, sympathy, and obsession”[1,2], plus neutral terms such as attitude, affection, and passion, so this is a study subject in a wide scope. The disciplines and sub-disciplines involved cover philosophy (including phenomenology, semiotics, and philosophical speculation), linguistics (such as cognitive linguistics, pragmatics, phonetics, lexis, syntax, and discourse), pedagogy (i.e. emotional embeddedness of curriculum, teacher emotional research, and emotional education evaluation system), psychology (cognitive psychology, positive psychology, and psychological counseling), cognitive science (brain science, emotional dependence, emotional theory, and emotional valence), management (emotion and emotional management), media studies (ergonomics, emotional involvement in advertising, emotional performance of film and television media, emotional appeal of Internet users, and user text emotional analysis), anthropology, culture studies, geography, and art (like aesthetics, music, architecture, painting, and calligraphy), medicine (such as emotional pathology, physiological and emotional reactions), and many other areas. Emotion topic is a multidisciplinary multi-level with multi-purpose research object. This article addresses the general term “emotion” in literature and mainly combs the literature reviews from the philosophical to cognitive perspective to address the emotional research situation at home and abroad, mainly on the changes from disembodied emotion to embodied emotion with the turn from the traditional to post-cognitive perspectives.

2. Studies of Emotion in Traditional Cognitive Perspectives

The study of emotion in traditional cognitive perspectives is acknowledged as more disembodied than embodied, although covering the wide-range topics from fields of the philosophical, psychological, social, clinical, anthropological, historical, cultural, linguistic, literature, and ergonomics.

2.1 Emotion-Ration Discussion in Early Philosophy

The early emotion research began with philosophical speculation, starting from the discussion of humanism in ethics. The discussion of emotion can be put into two classifications based on the diachronic evolution and development: rationalism and empiricism. Rationalism advocates rational determinism, the typical examples are such as Heraclitus’ Lagos doctrine and the expositions of emotion among the famous Greek “three masters” in apprenticeship. Socrates re-compassated “virtue is knowledge” theory, Plato treated the emotion as the
counterparts of the ration. According to his metaphor of white-black horses, the white horse is ration, the dark horse is the “emotion”, though two horses simultaneously drive the soul cart, yet it is ideal with the ration horse as the controller[9]. Aristotle argued that human ration (especially cognitive rationality, analytic ration) is the nature of human, the emotion and desire are actually controlled and dominated by the “ration”. He ever claimed that “man is a rational animal”. The then philosophy discussions on ration including the afterwards theories of Stoicism and moral rationalism in the 17th and 18th centuries did not address the emotion aspect yet. Even till late, Kant’s theory of moral emotion still separated the world of senses or phenomena from the world of ration. In the 19th century, the moral emotion doctrine, advocated by the British ethicist Earl Shaftesbury, began to attach importance to emotions. This is regarded as empiricist’s assertion, represented by Francis Hutcheson, Joseph Butler, Francis Bacon, David Hume, and Adam Smith. From the ethical point of view, Bacon put forward the importance of emotion in research. David Hume’s emotion dominance emphasized the utilitarianism of emotion. Adam Smith developed the theory of emotion resonance[10]. However, the above emotion and ration debate just treated the moral as a compass in the perspective of humanistic ethics, instead addressing the attribute of emotion concerning the physical body. Then, Descartes’ mind-passion fusion concept implicitly claimed that emotion is actually out of the physical body, although he emphasized that emotion is the basis of behavior, but he did not clarify the interaction between emotion and the physical body.

2.2 Philosophical Emotion Discussions in Cognitive Perspective

In fact, in the process of human evolution, emotion not only precedes the occurrence of ration, but also involves in shaping the evolution of rational activities and guiding people’s behavior. At the time when human intelligence was not so developed, it was the emotion on which human being depended to fulfill some cognitive activities, i.e. reasoning, decision making, and self-protecting[11]. Therefore, as for the philosophical speculation on emotion, the Chinese proposed various theories and formed different schools of thought and doctrine. The Pre-Qin Confucianism of “Benevolence” expounded that “emotion is more than ration, ration is in emotion”[12]. The focus was to discuss the law of the antimony on ration-emotion problem. This is the split of “ethic orientation” and “individual orientation”. Later, there was a series of discussions on trichotomy of “knowledge, feeling, intention” and their corresponding relationship with related psychological theories in the perspective of emotionalism[13]. In the west, Spenos also believed that emotion is the core aspect of human nature, and that emotion is understood as the physical state of feeling[14].

3. Emotion Studies in Embodied Cognition Perspective

3.1 Beginning of Embodied Emotion Research

At post-cognitivism time, the embodied cognition addresses the re-discussions on emotions of human being. With embodiment cognitive view, emotion is a part of cognition, and it is the innate instinct of human beings. Among Chinese philosophers, the four integrity of Mencius (benevolence, righteousness, etiquette, and wisdom), Confucian “seven emotions” (joy, anger, sorrow, fear, love, evil, and desire), and the theory of “disposition-emotion” in Neo-Confucianism, Taoist Chuang-Tzu’s “sentimentless sentiment”, explain the inseparability of emotion and cognition, and the connection with physical body and experience. In addition, no matter it is Freud’s “emotion iceberg” or Leibniz’s “whole mountain” (i.e. “whole list”)[15] Both views indicate the embodied nature of emotion. Emotion is human instinct[7].

From the previous discussions, we can see that in fact the embodiment of emotion has been involved for a long time. However, the real comprehension of embodied emotion is not until by the end of the 19th century and the beginning of the 20th century when the emotion became the object of the psychologists. While the explicit concept of the embodiment is even later[9][12]. In explaining the meaning of emotions, Mandler showed that emotions are embodied[13]. Izard’s model of emotion-cognition-motion response also illustrated that emotions are embodied[11]. Denzin expounded the relationship between emotions and lived experience from a sociological point of view[14]. Painter et al. have discussed the non-current cognition of emotion from the experiments of visual narration[15]. Because the embodiment is a new cognition turn, so the embodied emotion is also a new research orientation.

3.2 Relationship between Emotion and Behavior

Embodied cognitive views that the embodied emotion can cause changes in the physiological, experiential, and behavioral aspects of human beings, therefore, with the same cognitive view, emotion and specific behavior are related to each other.

Both Allport’s theory of temperament[16] and Liang’s “the innated nature” emphasized the integration of emotion and action. Darwin emphasized the external stimuli and the explicit behavior of emotions in recognition of the relationship between emotion and neural pathways[18]. James combined the above-mentioned ideas, put forward the integrated emotion view of stimulus-behavior-experience[19]. McDougall’s spiritual-material instinct advocated the interaction exploration of conscious activities and emotional activities to form the overall initiative. He also proposed the theory of human social behavior based on the relationship between genetic instincts and corresponding emotions, as well as the feelings acquired after birth[20]. Harlow & Stagner focused on the emotional awakening of the environment and the
mechanisms of social inducement. Watson and other behaviorists mainly used stimuli to explain the relationship between emotion and cognition. Bindra argued that the intimate connection and interaction between physical arousal and cognitive evaluation determines emotions. Young detected the process of emotional change from behavioral analysis. Young argued that emotions are dynamic and can describe the process and dimension of emotional polarity through the similarity of coordinate scale. Millenson emphasized the embodiment effect on emotion in the emotion-affection distinction and their dimension measurement. Based on the physical basis of physiological nerves, Bindra explained the different mechanisms of action of central motion on emotion and motivation. Siminov found that emotion is determined by the physical body's information saturation. By studying the specific emotions of fear and anxiety, Gray tried the stimulus-response manifestations of metamorphic emotions or pathological emotions and noted that emotional research must incorporate subjective, behavioral, and physiological linkage mechanisms and introduce emotional evaluation factors, which are more comprehensive cognitive emotion researches. Whereas Bower's study suggested that emotions are determined by the perception of presupposition or latent body motion. Aronld conducted an interdisciplinary study on the emotions related to the phenomenology, physiology, and cognition. Her theory was based on evaluation factors of cognition and physiological speculation in relation to psychological activities. She believed that emotion is a strong tendency of perception evaluation mechanism, while evaluation is based on the embodiment experience and imagination on the embodiment. Thus the cognitive pattern of emotion is perception-evaluation-sensation-action. Whereas action (including physical movement, facial expression, body posture, etc.) is the very explicit impulsive behavior caused by emotion. Therefore, the action mode can distinguish the emotion. Based on phenomenology theories, Hillman thought that the internal emotion is closely connected with the external environment, and have to be treated via therapy (especially when it comes to negative emotions). Related with the outside world, especially negative emotions must be treated pathologically. Lazarus's series of emotion studies show that he emphasized the decisive roles on the emotion, which play from the peripheral nerve to central nervous stimulation plus social and cultural factors. Also, the impact of the evaluation system on specific emotions was illustrated in From the cognitive perspective, Aronld and Lazarus found out the source of emotion interpretation. They both believed that evaluation is the fundamental condition of emotion elicitation, thus it is the decisive factor. Meanwhile, pathological studies show that the prefrontal cortex of the brain is closely related to emotional stimulation and expression, thus in relation to the arousing of human emotion. Lindesley attested that emotions are expressed in three ways: Through the cortical pathways, visceral pathways, and somatic movement pathways. Pribram has been aware to study emotions via multimodal senses and to distinguish between emotion and mood. However, it is agreed that the recognition of embodied emotion was then still at the initial stage. That is, though the connection between the emotion and the physical body was seen, the embedded nature of embodied emotion had not been recognized yet, due to the view of upholding that emotions were purely subjective experience and could be separated from consciousness. Among the above-mentioned theories, some thesis emphasized either the role of the nervous system in emotion, or the attribution of emotion to the environment, or some theories simply treated emotion as a motive, or some just regarded emotion as only one aspect of behavior. Some theories, such as Aronld and Hillman, were even believed as conjecture. However, most of these theories should be acknowledged as being built on the experimental results.

3.3 Comments on Researches of Emotion-Behavior

In fact, the emotion researchers have long been aware of the relationship between emotion and behavior. The behaviorism discussed more about the association between emotion and behavior. Darwin has been found that human and other animal’s emotions are not only embodied, but also correspondingly related to the action, i.e. scratching their heads may be due to the lived experience of skin’s itch. Eye-rubbing or coughing is actually related to “embarrassing” feeling. His research describes how almost all human emotions are associated with human modal organs (head, eyes, eyebrows, nose, lips, teeth, skin, fist, body posture, muscle, forehead, elbow, and hands), for example, the eyes and mouth will open and eyebrows will up-rise when surprising, whereas the face will blush if feeling shame. Whenever at fear, the reactions are as follows: The heart will beat faster, the breath becomes shallow, lips are trembling, limbs are feeble, and goose bumps are found on skin. Crying is an obvious sign of sorrow. These physical reactions or gestures of behavior are instinctive responses to emotions. According to Piaget, perception cannot be separated from behavior to a large extent, which forms a so-called binding relationship. But Piaget did not further explore that it might be the emotion that motivates the behavior mechanism. However, Bowlby noticed this problem and suggested an “attachment theory” which soon becomes an eminence in studies of psychology (especially children psychology, and psychological counseling) and sociology. Psychologists also found the association between facial features and basic emotions such as pleasure, surprise, and anger. Plutchik suggested to use observed behavior for emotion description, as well as the expression of emotions through the degree of subjective response to environmental adaptability. Emotion is a modeled bodily response. Tomkins thought that emotion and motivation are mutually connected but mainly reflected through the response of facial expression, and found that...
emotional and physical associations relate to brain temperature changes and release of neurotransmitter (substances transmit neuro impulsion). They also found the contraction of facial muscles also reflects and affects the interior emotion, which he called as “non-verbal leakage”\(^8\).

However, Behaviorism put more focuses on behavior than emotion. Though some of them like Duffy\(^7\) has suggested that emotion is associated with multiple dimensions of physical behavior (energy level, organizational function, and state of consciousness), yet he stagnated due to struggling with the specific measures and testing standards on dimensions.

Other behaviorists like Frijda also just associated with emotions through the concept of “behavioral intention”\(^6\). Empirically in the EEG tests, Lindsley\(^9\) and others just used animals such as cats as the subjects which cannot be generalized to humans.

It is commented that behaviorism is more interested in the emotional behavior and its physiological response, whose purpose expects to anticipate and control emotions; while phenomenology is concerned with the description of emotions, whose aim is to give contextual meaning to emotions. However, in fact, emotion is a mixture of observation and experience, behavior, and meaning, so it should be discussed in combination. According to the physiological neuroscience, all the systems like brainstem, hypothalamus, neocortex, gland, endocrine system, peripheral mechanism, central nervous system, autonomic nervous system, neurochemical changes, and edge system are involved into emotion. Therefore, emotion is definitely embodied and embodied emotion is a new turn in cognitive perspectives.

4. Research on Embodied Emotion Abroad and Home

To sum up, emotion studies are classified into two schools: one is emotional determinism. This view is mainly a number of psychiatric analysis and lived experience exploration on emotion. The representatives of this school are psychiatrists such as Freud, Rapaport, Pradines, Hillman, Sartre, and Leeper\(^8\). Another one is behavior determinism, which actually ignored cognition. The representatives of this school can be listed as Duffy, Lindsley, Young, Bindra, Harlow & Stagner, Millenson, Gray, Bower, and Schachter. While with the cognitive perspective, it is not the focus to discuss which decides which, instead, it is believed that emotion and behavior are a holistic interaction, they are mutually embedded\(^7\). The embodiment cognition has already aroused the attention of Chinese scholars. At the beginning of the 21st century, a group of scholars have carried on the academic research propositions to the embodiment cognition turn. The embodied emotion research has become one of the hot topics. The literature shows that mainly the psychology and cognitive science (including cognitive linguistics) are in tracking this front line. The publications are related to five aspects: 1) Translation and introduction of embodied emotion concept\(^7\), 2) introduction of embodied emotion theories and updated research paradigm\(^8\), 3) empirical studies for understanding of the embodied emotion\(^8\), and 4) applied research on embodied emotion in practice\(^7\).

5. Conclusions

Embodied cognition of emotion research provides a wide range of reference dimensions for other disciplines or interdisciplinary emotional research, such as ergonomics. From the above reviews, we can see that emotional research, which began from philosophy discussion to specific disciplines till to interdisciplinary research, has processed the evolution speculation theory to empirical research. The crucial turn is from the disembodiment to the embodiment, which elicits a good number of research topics at multidisciplinary multi-level for multi-purpose.

References


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