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REVIEW OF CONSUMER COGNITION RESEARCH FROM THE EMBODIED COGNITION PERSPECTIVE IN THE CONTEXT OF ONLINE CONSUMPTION

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ABSTRACT

The cognition of cognition is a hot topic in the field of cognitive science in recent years, and it has also attracted a lot of attentions in the study of consumer behavior. An embodied cognition perspective in consumer research suggests that consumer perception is based on the consumer's sensory experience. This paper gives a briefly review of the origin and development of embodied cognition theory. Online consumption context is the background of this research. This paper summarizes the latest research of embodied cognition theory in this field. Although consumer perception is limited to some extent in the context of online consumption, visual and auditory can help consumers to form virtual tactile, olfactory and taste perceptions due to the existence of multi-sensory crossover mechanisms in the brain. The consumer's virtual sensory perception enters the consumer's cognitive system and transforms into a product/brand knowledge system based on mental imagery and metaphorical cognition. This is the consumer cognition process in the context of online consumption.

KEYWORDS

Embodied cognition, mental imagery, virtual sense, metaphor.

1. INTRODUCTION

In the book "The Unity of the Senses: Interrelations among the Modalities" of Lawrence Marks, he said that "all human knowledge comes from the senses". Following the computational metaphor cognition view and connectionist cognition view, embodied cognitive theory gives a new interpretation of how humans acquire sensory information from the external world and transform it into an internal conceptual system. As the developing of cognition science, embodied cognition theory has gradually changed from the initial philosophical speculation to the research paradigm used in the field of cognitive science to explain various social phenomena and psychological phenomena [1].

2. FROM INFORMATION PROCESSING TO EMBODIED COGNITION.

As more and more question about the computational metaphor cognition view and connectionist cognition view, the embodied cognition view has begun to be recognized by more and more cognitive science scholars since the 1980s. The embodied cognition theory was first published in Chinese academic journal in 2006. Li Hengwei and his research partners wrote three articles on the embodied views of cognition. Their articles were published on journals about philosophy and social science. They detailed discussed the embodied cognition theory and explained that cognition should be seen as a body-centred physical activity. In 2007, Dr. Xu Xianjun paid attention to the change from disembodied cognition view to embodied cognition view in his PhD dissertation. In 2010, two articles written by Professor Ye Haosheng entitled "Cognitive Psychology: Dilemma and Tendency" and "Embodied Cognition: A New Approach in Cognitive Psychology" introduced the embodied cognition perspective into Chinese psychological science research. So far, researches on cognition in China become increasing pay attention to this view year by year. By May 2018, there are 680 relevant research literatures about embodied cognition in China. Most of them are focusing on learning theory and teaching research based on embodied cognition or language learning and language comprehension research based on embodied cognition.

Table 1: Numbers of Cognitive Research Literature

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Articles	3	4	1	11	16	20	53	73	107	108	106	133	45

(Source: China Knowledge Network Search Results, <http://cnki.net/>, search date: 2018.5)

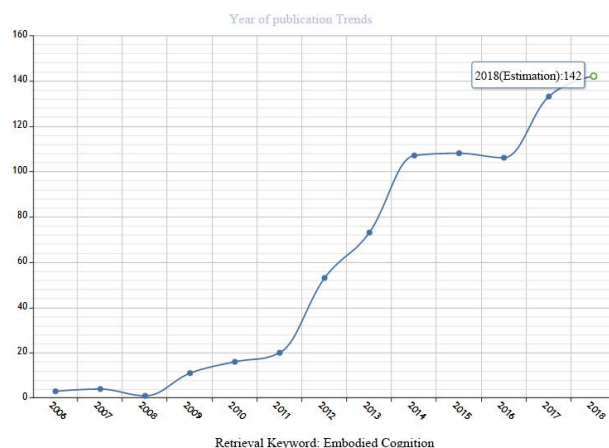


Figure 1: Trends in embodied cognition research (Source: China Knowledge Network Search Results, <http://cnki.net/>, search date: 2018.5)

Early cognitive psychology mainly understood human cognitive behavior based on computer hypothesis. Human cognition is thought to be similar to computer information processing. And the processing is completely happened in human's mind and irrelevant with the external environment. Human cognition is understood to be essentially equivalent to the computing power of a computer. The acquisition of human knowledge is the understanding and re-recognition of things based on information processing within the psychological activities such as perception, conceptualization, judgment or imagination [2]. Cognitive information processing perspectives view human cognition as a process that proceeds

in a sequential order. The whole process is divided into three stages: sensory memory, short-term memory and long-term memory. When information stimuli are noticed by human, the information is encoded, repeated and kept in short-term memory. Then reasoning, decision making and final response are determination by long-term memory. The information processing perspective emphasizes the role of knowledge. It is believed that knowledge is the main factor determining human behavior. Cognition is the process of changing the internal knowledge structure. It is considered that human cognition is a systematically processing of internal knowledge structure when new information come in and finally forming a new knowledge structure inside [3].

While the cognitive processing perspective are questioned more and more, scholars recognize that human cognitive processes cannot be analogized by computer information processing in many situations. The processing of information by the human brain is not in order. Scholars with a connection view believe that multiple stimuli in human cognition are often simultaneous. Cognitive function is parallel processing mode. So these scholars use neural networks in neurology to explain human cognitive mechanisms. They interpret the ability of humans can process a large number of cognitive operations simultaneously as the result of cognitive units connected with each other in the cognitive network. And the human knowledge is considered to be characterized by a joint network of cognitive nodes and links between nodes. Each node can characterize concepts, propositions, and so on. The connection mode between nodes is knowledge representation. Human learning behavior is the processing of establishing, strengthening or weakening the connection between nodes. Individuals can perform cognitive activities such as inference and generalization to make new information and knowledge by using the connection between nodes. These activities can help humans to continuously improve the characterization and operation of our knowledge [4].

Cognitive information processing view and connection view are different, but they all regard human cognition as thinking activities that are not related to our body. Recent years, cognitive psychology researches begun to focus on improving the ecological validity of cognition research. It is advocated that the real understanding of human cognition activities should consider the background of cognition activities and put human cognition into a certain situation to study. Scholars began to emphasize the role of our body in the cognition process: cognition comes from the body, and body sensation affects cognition processes [5]. In essence, cognition is a physical experience that stems from body which has a certain physical structure and athletic ability. This view breaks the traditional notion that human cognition structure is abstract. Cognition is considered to be a perception-action model which is formed by physical activities [6]. It is an "internalization" of body movements. It can't be separated from the human body, it is "embodied". This view has had a great impact in the field of psychological research and social science research [7]. Cognitive psychologist Adam laments: the embodied cognition view is sweeping our planet [6].

3. THE EMBODIED COGNITION VIEW IN CONSUMER BEHAVIOR RESEARCH

The development of cognitive science has also brought a new perspective to consumer behavior research. Traditional cognitive science explains the treatment of external information by the human brain and the behavioral responses that are stimulated. In early cognitive science research, individuals are more likely to be passive participants in cognitive activities. Researches focus on the working mechanism of human brain or human mind in dealing with information or stimuli which comes from the natural world. They study the information processing how human forms attention, memory and inference. Cognition linguists Lake off and Johnson criticize the dualistic cognition, which separate cognition subject from the object. They propose human experience to be embodied. The embodied cognition theory advocates that human body is not only the carrier of thinking, but also provides information for the judgment of human thinking. The embodied cognition perspective is integrated into the research of consumer cognition more and more. The Journal of Consumer Psychology, the authoritative journal of consumer psychology research, published a special issue on the theme of sensory perception, embodied

and rooted cognition in consumer behavior (2014, Volume 24, No 2). Discuss the relationship between sensory perception and consumer behavior. Krishna and Schwarz argue that spiritual activity is rooted in the sensory experience. They interpret consumer sensory perception, mental imagery and spiritual simulations triggered by sensory marketing from an embodied cognition perspective [8]. In the brand research, Wallpach and Kreuzer adopted the concept of embodied cognition and proposed a brand knowledge system based on it [9]. Liu Shengnan and Dong Dahai give a new understanding of consumer perception in their study about consumer virtual tactile experience in the context of online consumption [10,11]. Wei Hua, Duan Haijun, and Zhou Zongkui's give a summarizes of consumer behavior researches from embodied cognition perspective.

In consumer behavior research, cognition, motivation, and learning are the three basic factors that modern marketing introduces from psychological theory. They are also considered to be three categories of human behavior [5]. Motivation is the driving force or desire that trigger human behavior; cognition refers to spiritual phenomena such as perception, memory, judgment, and thinking; learning are behavioral changes based on external stimulus and time passed by. Behavior is triggered by needs. The state that awaken by needs is motivation. A series of complex psychological activities followed by motivation is cognition. The cognition process aims to solve individual needs. And the result of cognition is to make the objects that may meet the needs of consumers enter individual's consciousness. That is to say the result of consumer perception is letting objects that may meet consumer's needs enter their consciousness. For consumers, these objects are products and brands. Consumer cognition refers to the cognition processing when an individual is a consumer. Influenced by traditional cognition psychology, consumer cognition is considered as a interpretation of the real world in most consumer-related research. It is a general term for a series of psychological activities and language using when consumers solve consumption problems [12]. Consumers classify the knowledge acquired from the nature world. By remembering and associating, concepts are formed and stored in brain. They can be recovered when it needed. The consumer perception view from embodied cognition perspective agrees that consumer's product cognition process begins with their sensory perception.

Based on the sensory perception and knowledge in mind, products information are processed to form consumer cognition about product. Product quality, price and other marketing factors are also making effects in the consumer decision-making process through cognition activities. Xu Peng gives a detail illustrations of human cognition pattern in his research (Figure 2). He believes that individual cognition begins with sensory perception. Information and environment trigger consumer behavior through perception and reflection. Feelings enter the human cognition system are transformed into actions after cognition activities such as thinking, contrasting, inference and understanding. This part of behavior will be regulated by long-term memory. The content stored in the long-term memory system is mainly for semantic understanding [13].

The stimuli from the environment are large and diverse, but the fact is that only a part of the stimuli will be noticed due to the existence of perceptual selectivity and the limitations of the human perception threshold. Exposure occurs when consumer feels the stimulus. Exposure to stimuli is not completely inevitable. Consumer has a tendency to ignore information that he is not interested in, that is, consumer concentrates on a part of the stimulus and they enters his mind while the other part is ignored [14]. Consumer will consciously choose and identify the stimulus. But some of the environmental stimulus impacts can not be recognized by consumers. Williams and Bargh's research found that the body perception of physical warmth affects the perception of enthusiasm in interpersonal relationships. They found that in the process of judging the personality of a person, if individual being tested in a warm environment, he will be more inclined to think that the person is warm and friendly than the individual's judgement that is tested in a cold environment [15]. And this effect is unconscious for the people who is in testing. Xu Peng also noticed the influence of information and environment on feelings, as well as the

cognitive reactions caused by unconscious stimuli. He integrates

environmental factors and unconscious cognitive responses into the research of consumer cognition.

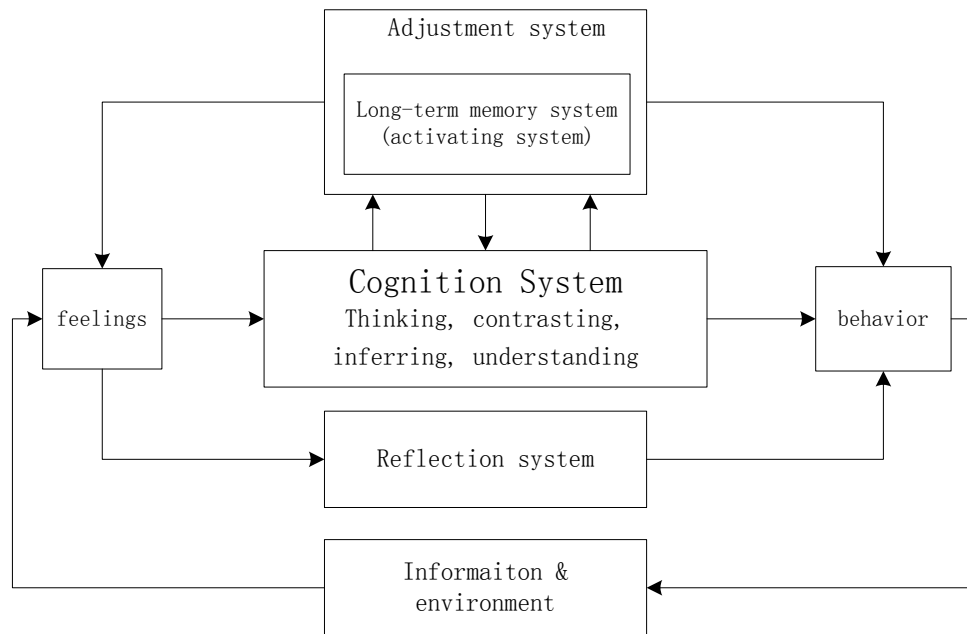


Figure 2: Human cognition model

In Wei Hua et al.'s research, they noticed that sensory marketing influences consumers by shaping a rich body experience. That force they to think about how the physical experience affects consumers' cognition process and their final consumption behavior.

They attribute the influence of senses on consumer perception and behavior as assimilation effects and compensatory effects. The assimilation effect refers that the sensory perception which evoked by the product that connect to a kind of psychological state that have a positive effect on the formation of consumer attitudes and consumer decisions making [16]. For example, warm colors make consumers to feel the psychological state of interpersonal warming and increase their willingness to donate. Also, warm sensory perception improves the experience of interpersonal relationship in the environment, so that individual's consumption attitudes and decisions are more affected by others in that environment. The compensation effect means that when the consumer feels a lacking physical state, they will compensate and alleviate the state by external consumption. For example, the demand and evaluation of hot drinks will increase in cold conditions [5]. Bram et al. Studied Bram et al. studied the consumer's willingness to purchase a house in different temperature. They conclude that a colder environment will increase consumer's need to affiliate and increase consumer's estimation of how homely the house [17].

By reviewing the existing consumer behavior and consumer psychology research, it found that more and more scholars agree with embodied consumer cognition. It emphasizes the fundamental role of consumer sensory stimulation in consumer cognition processes. Sensory stimulation is the leading factor for subsequent brand cognitive behaviors [18].

4. VIRTUAL SENSORY PERCEPTION IN THE CONTEXT OF ONLINE CONSUMPTION

External stimuli enter the brain through the five senses of the human body and begin its "cognition journey". Consumers will choose and identify the stimulus. Some choice and identification are conscious for consumer while others are unconscious. Consumers tend to expose themselves to the stimuli they are interesting in. And interpret and organize the information into his mind on the basic of his existing belief. That is to say how consumer explains the sensory stimuli is based on his original beliefs and attitudes. The direct sensory experience is known as the best way for consumers to know more about the product. Marketers are also trying their best to make the indirect product information, such as advertise show, closer to the real product experience [19]. However, in the study of

consumer behavior research and brand cognition research, the effect of sensory perception and experience are not given enough attention [20]. In marketing, the importance of sensory in brand building has also been neglected for a long time. Most existing consumer behavior research places more emphasis on non-sensory cues and product attributes such as price discounts, reputation and so on [21]. In recent years, the role of sensory perception in judgment and decision-making are aroused great interest in marketing and psychology research.

In marketing, researches on the role of feelings in consumer behavior is defined as sensory marketing. Sensory marketing advocates that consumers' perception, judgment and behavior should be influenced by marketing method that has effect on individual's feelings [22]. The computer metaphor of human brain information processing is challenged by views that the mental activity is rooted in human sensory experience [8]. The human sensory experience is a kind of cognitive information [23]. People use this kind of information as the same as they use other types of information. In recent years, the research on the influence of sensory perception is mainly from the perspective of experience. Researchers believe that the sensory elements used in marketing can be a trigger of creating consumer subconsciousness, and sensory marketing elements that cater to basic senses are more attractive to consumers. This makes consumer to build his own brand attributes in his mind rather than the brand attributes provided by the advertisements. It makes the brand abstract concept perceived by consumer more distinctive [22].

In the traditional consumption, the sensory perception of consumer is made by seeing, listening, smelling, tasting, touching and other body movements. This direct sensory experience derived from sensory stimulation is the most credible for consumers. In this process, consumers can control his attention and experience rhythm to get as more information as possible. In this way, consumers can better anticipate his future consumer experiences [24]. This sensory experiences are restricted in the context of online consumption. Sensory experience process becomes an indirect experience. The acquisition of product sensory information relies mainly on visual and auditory rather than five senses. The main information form is no longer the direct sensory stimulation triggered by the real thing, but the sensory description information expressed by text, pictures and video. With the support of multimedia technologies such as wide zoom, 3D virtual applications, virtual reality, and video, the acquisition of visual information in online consumption is getting closer and closer to the reality [25]. Perceived gaps in size, shape, stereo perception, etc. are constantly being compensated [26]. However, other senses, especially multi-sensory, is still relatively lacking, and in

most cases it can only be compensated by text and picture descriptions. Obviously, the basic interaction between human body and product is lost in the context of online consumption. Consumer perception in this context is a virtual indirect experience. Consumer sensory perception in these two consumption scenarios cannot be equated. But the study of virtual sensory experience shows that this interactive and multi-media can make consumers immerse in it and ignore the existence of the media, resulting in a scene similar to real consumption. The process of obtaining and interpreting product information is as if they are directly experienced [19]. Direct experience is more persuasive than indirect experience (such as advertising) because it directly stimulates consumers through five senses. And the web-based media experience is more realistic and persuasive than the indirect experience because it is interactive and can better stimulate consumers' multi-sensory perception.

However, only a few researches pay attention to the virtual sensory experience in the context of online consumption. For example, Liu Yanan and Dong Dahai studied the causes and outcomes of virtual haptic. They believed that consumers could not directly touch the goods to obtain the tactile experience under the online consumption situation, but with the support of body schema, body imagery and virtual presence in consumers' brain, the visual and auditory information will be processed in a way that associated with the tactile information [10]. Because individual's five sensory processing area is not completely separated from each other, they are integrated. It is called multisensory interactions. A theoretical models of multisensory cues integration has been given by Wen Xiaohui and Liu Qiang. So tactile information can be obtained because the existing of visual-tactile and auditory-tactile sensory integrated mechanism. It is called virtual haptic because it is not obtained by direct sensory stimulate. In the context of online consumption, consumer has a virtual haptic experience through online media. The latest research by Zhu Guozhen and Wu Liya also agrees with this view. As most online consumers are adults, they have already stored enough information about the relationship between vision and touch. The visuals acquired in the context of online consumption can stimulate the consumer's memory about tactile and organize the tactile information of product in his mind to produce a near-realistic tactile experience [27]. From neuroscience, through neuroimaging techniques, it is found that the brain regions stimulated by the visual simulation with the images of the strokes and the direct stimulation of the skin are largely coincident. Therefore, Brunyé and other scholars proposed that the brain uses the "visual-tactile mirroring mechanism" to perform the touch mental simulation when there is no actual touch. Marketing scholars have also introduced such ideas into the study of advertising effects. The results have successfully confirmed that advertisements with product tactile information can stimulate the feeling of touch. People who participate in the survey feedback that they feel a sense of touch [28]. Research of Overmars and Poels also confirms that visual input is capable of triggering tactile senses. In the interactively online consumption, technologies such as wide zoom, video, 3D applications and virtual reality enable consumers to have a sense of control over online products and trigger a tactile sensation. This enhances the perceptual diagnosis of the product, and consumer are stimulated by pictures in which product experience actions, such as caress and grip, are showed. This can increase the tactile perception of the product and enhance consumer perception about product attributes [28]. Klein believes that the lack of real tactile experience in online consumption can be compensated to some extent through the use of virtual technology. In the context of online consumption, the richer the multi-media is, the stronger sense of control and stronger virtual presence does consumer have. Consumer's attitude and belief about product attributes are more confirmed [19]. In the context of online consumption, it is short of direct sensory stimulation. But the multi-sensory perception mechanism can well support consumer's producing of sensory experience of products based on the interactive information environment. In traditional consumption context and in online consumption context, consumer's sensory information processing area in the brain are intrinsically related. In the context of online consumption, consumer sensory perception is called virtual sensory experience. Product information stimuli and product physical stimuli are likely to provoke a similar brain response.

5. CONSUMER MENTAL IMAGERY AND COGNITIVE METAPHOR IN ONLINE CONSUMPTION CONTEXT

The representation of sensory information in working memory is mental imagery. It plays a very important role in information processing, especially when feelings and attitudes are formed in an indirect media environment. Mental imagery contains specific sensory representations of thought, feeling, and memory. This allows individuals to recover their past experiences in their minds [29]. Constructing a mental representation in absence of sensory stimulation is one of the basic abilities of human brain. Mental imagery refers to a psychological event in which a concept or relationship is visualized. In this process, the individual's sensory or perceptual experience is represented by imagination in units of thinking, feeling, and memory [30]. The imagery may be multi-sensory. Because people can merge multiple mental images when exposed to multiple stimuli of vision, auditory, haptic or taste. It may also be a single dimension, where visual imagery is the most, and auditory imagery is the second [29]. Existing research on consumer behavior has shown that visual and auditory advertising messages can stimulate mental representation and further influence cognitive, emotional, and behavioral intentions. For example, a variety of photos of a travel destination, combined with the consumer's previous experience, can generate a holiday experience in consumer's mind. And compared to static pictures, dynamic images can more quickly affect individual attention and behavior [31]. In addition to pictures, text also has a role in influencing consumer's intention. Burns et al. found that the behavioral intention are positively related to the specificity of advertising text and the degree of image vividness. Some studies have found that ads with relevant text can stimulate consumer mental imagery. When consumer experiences a high level of mental imagery, they can get enough decision information without a direct product experience. Researches from neuroscience confirm that conceptual information contained in pictures and texts activate the cerebral cortex. Research from psychology also confirms that pictures and texts can stimulate consumer's mental imagery about the indirect contact products. These all indicates that there is no fundamental difference between the consumer cognition behavior in the context of online consumption and the consumer cognition behavior in the context of traditional consumption. The only difference is that the sensory information source is different, but the sensory area in the consumer's brain plays the same role.

Through mental imagery, the individual's sensory stimulation or descriptive sensory information inputs are transformed into the judgment of physical and social attributes of the objects. As far as consumers are concerned, sensory information about products is transformed into product attributes and social attribute judgments under the influence of mental imagery and has an impact on consumer psychology and behavior. The sensory information could be sensory stimulation or descriptive sensory information inputs. Hagtvedt makes seven experiments and concludes that consumer's perceptions of product attributes such as durability and convenience are malleable. He finds the use of color can affect the judgment of product attributes. For example, dark color make consumer feel the product more durable and bright color make consumer feel the product more convenient. This is because consumer associate colors with weight in cognition judgment [26]. Henrik and Adam found that color saturation can increase the perception of product size [32]. Elder et al. found that sensory experience is also associated with distance perception in mental imagery, including physical distance perception and psychological distance perception. In four experiments, they verifies that closer sensory images bring a closer physical and psychological experience, while farther sensory images bring a longer distance feeling about physiological and psychological [31]. Similarly, Schlosser's research also points out that psychological distance is affected by temperature, space, and social distance. Senses can characterize the distance from a lot of way. For example, if the individual can touch and smell the object, it will make people feel closer to it and people will feel faster to it while only hear and see it. Based on this, Schlosser confirmed through three experiments that when the sensory distance matches the psychological distance, it can shape a more vivid mental imagery and improve the persuasiveness of the message [33]. Therefore, mental imagery is one of the internal psychological mechanisms that link sensory stimulation with product

attribute judgment and social attribute judgment.

In the past, language processing and understanding is considered to be a symbolic process based on an abstract model (called Amodal symbols). Symbols are random connected to objects. But in the past decade, the dominance of this cognition perspective are challenged by embodied cognition view more and more. The body's view is that language processing should also be viewed in the context of the relationship between mind and body [34]. Scholars who agree with the embodied cognition theory deem that language processing should also be based on the relationship between cognition and body. Numerous studies in neuroscience support this view. Studies have shown that processing vocabulary and real things what the vocabulary means activates the same brain area. Even the abstract vocabulary and sentences also evoke the same degree of sensory simulation as the specific vocabulary and sentences. Cognitive psychology and cognitive linguistics also show that visual, motor, and emotional are also activated during sentence comprehension.

It can be said that mental imagery well explains how online consumers convert sensory information acquired from the external environment into information that processed in brain. Through it, it is clear that consumer cognition is rooted in consumer's senses. Cognitive metaphorical mechanisms can well explain the relationship between sensory and cognition or the relationship between sensory and knowledge building. How specific stimuli activate the memory system to provide meaningful explanations and produce useful reasoning is well explained [35]. The word metaphor comes from the Greek word "metapherein". Meta means change, and pherein means endure. A meta occurs when the attribution which is normally used to describe an entity is transferred to describe another entity [36]. That is, metaphor refers to "using a statement about something to express the understanding and experience of another thing" [37]. When "metaphor" is mentioned, it is also considered as the rhetoric in literary works. And it is thought that people can live well without it. But Lakoff and Johnson found that metaphor does not only appear in language using, but also appears in human thinking and action. They proposed that it should be regarded as a cognitive mechanism which help people to form a conceptual system. It is a cognitive mechanism which human depends on. Human conceptual system is the basis of human perception, and it is at the core of individual's cognition system when people dealing with the real world they faced everyday. Based on the metaphorical phenomena in language, it is also found that the concept system of human beings is also metaphorical in nature [36]. In line with Lakoff's viewpoint, Sun Yinan propose that the perception of external world can help people to understand abstract things. The subjective judgment about abstract things is largely derived from the human perception system. That is the conceptualization of subjective things by people is based on his experience or understanding of the physical movement of physical entities [38]. This view also explains Lakoff's idea that conceptual system is essentially metaphorical. For example, when we express emotions, we use 'high enthusiasm'. 'High' is a concept that formed when individual judges the space of external environment. It is metaphorically applied to emotion which is an abstract concept [37]. Metaphorical understanding of concepts can be seen as a mental tools that integrate semantic concepts into new concepts in a faster and more convenient way. There is a semantic commonality between understanding concrete things and understanding abstract things. Conceptual metaphors connect conceptual elements through their shared semantic features to produce rich meanings. Conceptual metaphors are not random associations that occur arbitrarily. The young individual's vocabulary description uses the sensory-movement area and the abstract non-sensory movement area in the mind. That is to say, metaphor is a kind of cognitive and behavioral reaction that develops from the infancy and is unconsciously generated in individual's mind. Individual interpret the world in a metaphorical way, which allows individual to understand the abstract perspective of the concept better. Metaphorical expression and understanding are very common in everyday communication. It can be quickly understood without special effort. And often used by people to make more sense in many aspects of their lives. And people often use it to make things in their lives more meaningful. This process is so daily and emerges early in human's life. People use it almost unconsciously in

understanding of many abstract schemas, conceptualizations, and knowledge about the world. After repeating and repetitive connecting experience, these metaphors become the basis for thinking and communicating abstract concepts in unfamiliar areas. Babbes defines this association between human cognition and physical entities as embodied cognition [39].

In consumer behavior research, Babbes's research found that using conceptual metaphors in advertisement is very effective and persuasive. The usual method to advertise key selling points is using metaphors to explain the most important elements in advertisement. It is common to use metaphorical descriptions to describe unfamiliar products or services. He also confirmed through three experiments that metaphors enable consumers to generate different perceptions about products. Whether it is an accidental metaphor in low-intervention tasks or a metaphor of experimental control, its affect on consumer decision-making is significant. And this affect is indeed generated by metaphor-based cognition structures rather than other semantic processing factors [39]. Chang and Yen also found that advertising using metaphors was more effective than advertising without metaphors. They suggest that marketing practices should pay attention to the matching of brands and metaphor types in order to maximize the advertising effect [40]. Mohanty and Ratneshwar's research also confirmed that too high incongruity between target objects and metaphor sources in visual metaphor advertising will lower individual's comprehension. The understanding of visual metaphor advertising requires cross-domain mapping between metaphorical sources and target objects, and this mapping is difficult to achieve. The higher the level of need for cognition, the better the cognitive effect stimulated by visual metaphor advertising. The neuroscience research conclusions support the metaphorical perspective of language understanding [41]. Anderson et.al pointed out that the mental imagery of an object word recruits neural circuit which is used when the object is perceived. Even when reading, the visual aspects of cognitive object semantic knowledge can be simulated in the visual area in brain [42]. More and more research conclusions in neuroscience indicate that word understanding includes shallow language-based conceptual representation and deep representation of conceptual visual attributes. More and more evidence from the body research supports a point of view that conceptual representation is rooted in the sensory and motor systems, not purely language-based. The conceptual representation of the object vocabulary is associated with the visual region, the auditory region, and the motion region in brain when the object is perceived.

Metaphorical cognitive mechanisms are very common in individual's cognition activities, also including the cognition activities of the individual as a consumer. When individual perceives the world and others, it is initiated consciously or unconsciously. It builds a bridge for people to understand the objective world. By capture the body processing and cognition model which originate from multiple sensory perceptions and introspective experiences, it builds embodied experience meaning about the product in the process of consumer cognition. That is, it helps consumers to organize, interpret and express unconscious embodied knowledge. As a part of consumer cognition, consumer brand cognition also follows such cognition rules. This cognition mechanism can also explain the existence of concepts such as brand personality, brand symbol and brand relationship. Because of the existence of cognitive metaphors mechanism, they are the result of consumer transfer the concept formed by people in social interaction to brand which is obviously a subjective object. Scholars have proposed to understand brand knowledge based on multi-sensory metaphors. Wallpach and Kreuzer believe that brand-related cognition representation is the result of consumer's conscious and unconscious brand experience. And they think brand experience is a multi-sensory brand experience. Retrieving embodied brand knowledge will activate the multi-sensory experience as brand knowledge is forming. This gives consumers the opportunity to express themselves in a form similar to their cognition representation. So, in the context of online consumption, the metaphor mechanism should be regarded as a bridge between mental imagery and brand knowledge system, and the mental imagery is based on sensory information processing.

6. CONCLUSION AND FUTURE RESEARCH

In the context of online consumption, consumer cognition starts with reading brand information in pictures and texts. Brand attributes or product attribution is generated under the influence of mental imagery and metaphor mechanism. Consumer construct a brand knowledge system that supports decision-making behavior in his mind. The result of consumer cognition is not only the memory, recall and association of the brand, but more importantly, it includes brand emotions and brand attitudes which are formed on the base of body sensory perception, and also includes brand knowledge which is a socialized interpretation giving to the brand that on the base of consumer's existing knowledge. It seems that consumer cognition in context of online consumption compare to traditional consumption are totally different. But in the two consumption contexts, the subject of cognition both are consumer. And consumer can do cognition and making decision both in this two contexts. That is to say consumer cognition in two context has some inherent internal connection between each other. This essential connection is the sensory perception consumer's mind. In the context of online consumption, consumer can not obtain sensory stimulation by touching, smelling and tasting. However, consumer has accumulated enough interrelated information between each sense in their daily life and traditional consumption. With the support of multisensory cortex in brain, consumer can get haptic, taste and smell cognition response and virtual sensory experience by the sensory information obtained by seeing and hearing.

This is a review about consumer cognition in the context of online consumption. Consumer behavior research from the perspective of embodied cognition are more and more popular. Some valuable conclusions have been given, but there are still some limitations in these researches. More empirical researches are appreciated in the future.

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