Chapter 3

THE COGNITIVE WAVE
Major Concepts

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Abstract: This chapter discusses the main psychological paradigms used in the past 100 years, psychodynamism, behaviourism and cognitivism based on an information processing paradigm, and later cognitivism based on complex interactive mental processes. It briefly introduces the main concepts of later cognitive psychology: consciousness, sensation, perception, attention, emotion and memory. Each of these concepts will be discussed in detail in later chapters along with their application to tourism. One basic assumption of cognitive psychology is that the brain emerged through evolution and has survival value. However, this means that the brain is not a unified

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designed organ but has layers of development, one building on the others. **Keywords**: Cognitive psychology; consciousness; attention; sensation; perception; emotion; memory

INTRODUCTION

A number of psychological paradigms have developed in the twentieth century to examine subjective experience such as psychodynamism, behaviourism and cognitivism based on an information processing paradigm, and later cognitivism based on complex interactive mental processes (LeDoux et al., 2020). While such labels provide a simplistic view of these developments (Costall, 2006), it is useful to discern a number of 'mainstream' paradigms, so their particular assumptions, focal problems, concepts and theories can be contrasted. For example, a shift from the behaviourism to cognitivism paradigm led to a revival in research on mental states and concepts such as emotion (Barrett et al., 2007). More recently, cognitive psychologists and neuroscientists have used advanced data collection techniques (electroencephalography skin conductance) and computer technology to identify mental events through neuroimaging (Miller, 2003). In this book, the focus is on the assumptions, focal problems, concepts and theories of cognitive psychology.

Origin of Tourism Psychological Theories

As is illustrated in Chapter 4 on stimulus-organism-response theory, tourism is an applied field of study. A range of disciplinary assumptions, theories and concepts are used to examine its phenomena (Jennings, 2001). As an applied field, the theory used in tourism is transferred from other disciplines. As a result of the different disciplines used to study tourism phenomena, a variety of theoretical and methodological paradigms are applied. Further, each discipline applied to the tourism field has a variety of sub-disciplinary approaches, each with its own assumptions, theories and concepts in turn. For example, insights from evolutionary psychology have been used to the study of tourist behaviour in contexts such as risk taking and extremeness aversion (Crouch, 2013; Kim et al., 2021; Kim & Seo, 2018; Kock et al., 2018).

These various psychology paradigms have been adopted in applied fields of study such as management, marketing, leisure, as well as tourism (Scott et al., 2017). However, researchers in these fields may use terms such as consumer behaviour, attitudes, motivation, emotion and cognition without referring to the original discipline's paradigmatic assumptions. In tourism, most psychological research adopts a behavioural paradigm, but will refer to motivation without considering the origins of this concept in drive theory and

the related assumption of homoeostasis. A behaviourist approach in tourism research correlates external stimuli found in a servicescape (Bitner, 1992) with outcomes such as emotional reactions, judgements, including perceived value, or measures of future behaviour (intention to revisit), and do not take into account subjective mental processes.

For example, an assumption of cognitive psychology is that the brain emerged through evolution. It therefore has adaptive functions that enable humans to succeed as reproducing organisms. Systems for perceiving, memory and cognition have evolved in a manner that allows adaptation to the environment. The evolutionary nature of brain means that there is no grand design, and the brain may display its evolution through a series of systems that 'work' and which have built one on another in complex ways. Thus, some mental biases may be conserved for their contribution to survival in the past (Cohen & Bernard, 2013). Several tourism researchers have examined the usefulness of evolutionary theory for tourism (Crouch, 2013; Kim & Seo, 2018; Kock et al., 2018).

One of the basic assumptions of cognitive psychology is that the mental processes determine thinking, feeling and behaviour. These mental processes include perception, attention, emotion, mental processing (consciousness, problem-solving, creativity, learning, language, decision-making and reasoning) and memory (Larsen, 2007). Thus, it is fundamentally different to the view that behaviour is determined by external stimuli only. Cognitive psychology is one part of a broader scientific enterprise. Cognitive science is an integration of cognitive psychology, biology, anthropology, computer science, linguistics and philosophy (Hunt, 1989). It represents an interdisciplinary effort to address the same basic issues that confront cognitive psychology.

In an applied field, the lack of discussion of definitions and assumptions can cause considerable confusion among authors and may be a main reason for many scholarly disputes. In addition, researchers may use naive folk psychology knowledge to examine tourism phenomena without defining these terms (Sibicky et al., 2021; Simons & Chabris, 2011). This is the reason why this book places considerable emphasis on disambiguation (Chapter 5).

A large number of existing tourism psychology studies adopt a behavioural approach, which focuses on correlations between an emotion and other variable to measure future behavioural intentions. For example, the behavioural approach to tourism experiences attributes a causal power over emotions to external environment, rather than to a subjective mediating process of cognitive appraisal, and therefore, largely ignores emotions elicitation processes. This leads to a lack of explanation on *how* a particular emotion is elicited and *why* different emotions may emerge from the same tourism experience.

KEY CONCEPTS

The key concepts of psychology are introduced here and discussed in the following chapter.

Consciousness

The concept of consciousness is fundamental to what it means to be human. It is related to the mind and body problem and the extent to which they are separate or the same thing. The mind concerns mental processes, thought and consciousness. The body concerns physical aspects of the brain-neurons and how the brain is structured. Many theories have been put forward to explain the relationship between the mind (defined as the conscious thinking 'you' which experiences your thoughts) and the brain (part of your body).

Behavioural psychologists avoid the mind and body problem by focusing on 'observable actions', namely stimulus and response. They believe that thought processes cannot be studied scientifically and objectively and should therefore be ignored. Radical behaviourists believe that the mind does not even exist. Monism is the belief that ultimately the mind and the brain are the same thing.

Reductionism versus dualism is a debate as to whether mental phenomena be reduced to physical. Reductionists consider that there is no evidence that the mind exists independent of the brain and massive evidence that mind is what brain does (Tryon, 2014). This book assumes a reductionist position and that neural structures and processes are the basis for consciousness (Tryon, 2014).

In the 1970s, cognitive psychologists used a computer analogy (information processing model) arguing that the brain can be compared to computer hardware that is 'wired' or connected to the human body. There are many criticisms of the mind as a computer. The information processing model emphasised encoding, storage and retrieval operations and took it for granted that all operations require a common data format, parallelling the operational requirements of a computer. Their emphasis on amodal knowledge representation has been disproved. But now it is known that, for example, visual imagery process is modal (Krishna & Schwarz, 2014). There is no physical respect in which the brain operates as does a computer.

There are a number of models of consciousness including the global workspace model (Baars, 2005). This model provides a cognitive architecture that identifies consciousness with the global availability of information. According to the global workspace model, information becomes conscious when it is simultaneously made available to a wide range of localised (and individually sub-personal) processes – jointly comprising a 'global workspace'. Other models include the predictive brain model which considers that

people create a mental model of what they expect the external world to be and then update it as sensations are received (Nave et al., 2020).

At a neuronal level, conscious awareness involves a distributed, highly integrated, dynamic system of populations of cortical and subcortical neuronal physical, electrical and chemical structures and organs throughout the brain. Nonconscious neuronal activities process and merge signals from sensors into an integrated mental representation of an event or object. Chemical neurotransmitters play an essential role communicating among cells across the brain participating in these processes and they are key to the flexibility of connectivity and overlapping activity (Statler, 2015).

Executive function refers to a suite of higher-level cognitive skills and capacities that generally promote successful human functioning. Attention, task switching, working memory and inhibitory control are usually described as executive functions, though there is debate about the precise definition of the term (Banich, 2009). Executive function involves some degree of updating information, shifting focus between targets or mental sets, and inhibiting irrelevant or distracting information (Miyake et al., 2000). Executive function has three characteristic features: it is effortful, operates consciously and engaged in service of novel goals as opposed to rote or overlearned ones (Miyake & Friedman, 2012). The executive function abilities evolved to help one deal with novel challenges (Berkman, 2018).

One important distinction is between unconscious and conscious cognition. Dual process theory indicates that not all cognitive processing is accompanied by consciousness in this sense of informational access. Unconscious processes are fast, automatic, intuitive and unreflective. These occur without the ability to report on them. The cognitive processes that give rise to conscious awareness are, by contrast, slow, effortful and deliberate. However, the unconscious processes posited in contemporary cognitive theories are not identical to the concept of the Freudian unconscious described in psychodynamic theory (Freud, 1961).

Evans (2003, 2008) refers to these as System 1 and System 2, and suggests that these systems differ in terms of evolution, structure and function. When one makes a 'gut' decision, it might be a decision that is based on System 1. When it is a more conscious, deliberative decision, it might be thought to involve System 2 processes more heavily.

Consciousness is a core concept in cognitive psychology. In this book, consciousness is considered a function of neural circuits although these neurons are not located only in the brain as is discussed in embodied cognition. Much of the behavior is due to subconscious mental processes.

Sensation

Mental activity is grounded in sensory experience. At present, there is a consensus that one cannot understand human cognition without taking into account that humans interact with the world through their senses and do their thinking within a body; but there is much less consensus about what this implies and how it is best conceptualised (Krishna & Schwarz, 2014). Embodied perception refers to a conglomerate of theoretical claims postulating that the body, its movements and the interaction with the environment fundamentally shape people's perception of the world. All these claims have in common that they criticise 'disembodied' notions of perception that are characteristic of the information-processing approach.

Perception

Sensations (the activation of sensory organs: eyes, ears, nose, skin and taste receptors) act as the initiator of the individual's perception of the surrounding world, a process through which sensory inputs are selected, organised and interpreted, resulting in a 'conscious sensory experience' (Goldstein, 2010, p. 8). Conceptually driven processes operate from the top down – from long-term memory to sensory memory – to identify the stimulus. Data-driven processes operate from the bottom up (from sensory memory to long-term memory) to achieve the same goal.

Attention

Attention is focused mental engagement involved in processing external sensations or internal memories and thoughts (Davenport & Beck, 2001) and which influences perception, memory and learning (Dayan et al., 2000). The quantity of sensory information the brain receives exceeds its processing ability and attentional processes direct attention those aspects of the environment which are perceived as particularly salient. Attention is related to goal achievement, memory processes and behaviour. In general, attentional focus is affected by top-down goals and bottom-up perception, where top-down goals are related to endogenous mental activities, and bottom-up perception, respectively, refers to exogenous stimuli from the external environment (Dijksterhuis & Aarts, 2010). Goals 'guide behaviour through attention' to particular parts of the flow of information (Dijksterhuis & Aarts, 2010, p. 467), allowing mental goals translated into overt behaviour (Monsell & Driver, 2000) and alerting person to goal-relevant information (Dijksterhuis & Aarts, 2010).

Attention may also be directed internally as is found in the concepts of engagement (Brodie et al., 2011), immersion (Ellis et al., 2018) and narrative transportation (van Laer et al., 2014). Higgins considers: 'Engagement is a

state of being involved, occupied, fully absorbed, or engrossed in something—sustained attention' (2009, p. 102). Similarly, a high level of immersion is characterised by [in part] 'high focus of attention on a limited stimulus field' (Ellis et al., 2018). Narrative transportation has been related to immersion (van Laer et al., 2014) and conceptualised as co-activation of attention, imagery processing and emotions (Appel & Richter, 2010).

Emotion

The study of emotions is difficult, due to the complex nature of this phenomenon (Harré & Parrott, 1996). First, there is need to differentiate the terms of *affect, emotions* and *mood,* as they are often inconsistently used in the literature (Bagozzi et al., 1999). *Affect* is commonly viewed as an umbrella term for specific mental processes, such as emotions, moods and attitudes (Bagozzi et al., 1999), while *mood* state is allocated from any particular object or event and refers to an affective state with a low level of intensity (Huang et al., 2012). Emotions may result in intense feelings and be associated with a specific factor, such as an event or person.

Emotion Appraisal

Emotions are mental events elicited by an appraisal of relevant stimuli and create measurable bodily changes such as sweating, raised heartbeat and so on. Over the past 30 years, the cognitive appraisal theory describing the formation of emotions has become accepted by most psychological and cognitive science researchers. Appraisal theorists maintain that the critical determinant of any positive emotion is the resultant evaluation and interpretation that arise after comparing an actual state with a desired state (Lazarus, 1991a, 1991b, 1991c). People appraise or evaluate characteristics of events in terms of respective goals or motives using structured appraisal dimensions (Scherer et al., 2001). Appraisal dimensions are inherent aspects of emotions themselves and appraisal theories specify appraisal dimensions that distinguish discrete emotions and illustrate their variance by dimensions and corresponding appraisal patterns (Scherer, 1997a, 1997b).

The study of emotions has a long history (Gendron & Barrett, 2009) with numerous streams of research. Over the past 30 years, cognitive appraisal theory describing the formation of emotions has become accepted by most psychological and cognitive science researchers (Ellsworth & Scherer, 2003; Frijda, 1986; Lazarus, 1991a, 1991b, 1991c; Roseman, 2001; Watson & Spence, 2007). Appraisal theorists consider that emotions are subconscious mental events elicited by an appraisal of relevant stimuli on a limited number of dimensions. Desmet and Hekkert write about emotional experiences that:

> arise from encounters with products that are appraised as having beneficial or harmful consequences for the individual's concerns, that is, his or her major goals, motives, well-being, or other sensitivities. (2007, p. 61)

Similarly, Volo writes that

> knowledge of the emotional tourists' space is essential in designing services which enable providers to relate with tourists in personal and memorable ways creating moments of engagements [that]. . ..amplify tourists' emotions. Indeed, it is argued that congruity with tourists' goals realization can elicit positive emotions while incongruity can generate negative emotions. (2017, p. 38)

Coping

Coping is defined as cognitive or behavioural effort to manage a situation that exceeds the resources of the individuals. One is able to reduce his/her emotional distress and induce more positive emotional states via coping. Negative emotions arising in service delays or failures can lead to either problem-focused or emotion-focused coping behaviours. Problem-focused coping behaviours refer to people's activities/actions to alter or manage the cause of a negative experience, such as switching to another airline or lodging a complaint with the airline company or seeking compensation like a refund or free accommodation. Emotion-focused coping behaviours refer to people's activities/actions to regulate and control their own emotions, such as disengaging themselves from the situation by using a laptop or mobile phone while waiting or seeking emotional comfort by complaining to a friend.

Emotions and Feelings

Often the terms 'feeling' and 'emotion' are used interchangeably but are distinguished here. Feelings are the result of an 'emotional body state' being signalled back to the brain, not only to the limbic system but also to the somatosensory system (Damasio, 1995). An emotion of happiness may result in a smile and thereafter the state of the muscles around the mouth, the effect of neurotransmitters released and so on are subsequently reported back to the brain reinforcing a feeling of happiness. This is why bodily feedback or unconscious priming, such as asking a person to smile, can successfully induce emotion (Briñol & Petty, 2003). More generally, emotions and feelings have a recursive relation, each making the other more likely (Han et al., 2007). This leads to the idea that feelings provide information to the brain as is discussed in feelings as information theory. Emotions are motivational and

informational, primarily by virtue of their experiential or feeling component. There is a limited discussion of feelings in the tourism literature (Buda et al., 2014), with most studies focuses instead on perception of external physical stimuli (touch, taste, smell and vision) rather than perceptions of conscious or unconscious emotional signals (Agapito et al., 2014).

Memory

Memory is a mental process by which information is encoded, stored and retrieved (Atkinson & Shiffrin, 1968), although memory may also refer to the information itself, the memory that one recalls and remembers (Winstanley, 2006). Cognitive psychology recognises two major types of memory having different capability and capacity. Short-term memory (working memory) can store information for a certain period of time but with limited capacity, while long-term memory has a large capacity and contains memories of experiences and information that have accumulated over a lifetime. Two types of long-term memory are distinguished: semantic and episodic memory (Pearce & Packer, 2013). Semantic memory is memory of general knowledge about the world (Braun et al., 2006), while episodic memory refers to specific memories such as personal experience (Pearce & Packer, 2013) and events (Braun et al., 2006). Autobiographical memory is a subset of episodic memory and has defined as recollected events that belong to the person's past (Pearce & Packer, 2013; Rubin, 2005; Tung & Ritchie, 2011). The spreading activation model describes how an entire network of ideas (schema) is searched to retrieve specific information from our memory.

Memory is not a perfect system and can be a subject to false information (Loftus, 2005; Roediger & McDermott, 2000). People may be unable to recall a prior event, may remember events differently from the way it happened, or remember an event that never happened (Braun et al., 2006; Braun et al., 2002; Roediger & McDermott, 2000, p. 149). Memories are malleable and can be distorted by outside sources, such as advertising or stories or due to later experiences. Attention given to new stimuli determines the amount information that becomes encoded for storage (Fivush, 2011).

CONCLUSION

Cognitive psychology seeks to unveil the mental processes occurring between stimuli and behaviour, thus assuming that mental processes include perception, attention, emotion, mental processing (consciousness, problem solving, creativity, learning, language, decision-making and reasoning) and memory (Larsen, 2007). Elucidating the key concepts and principles in cognitive psychology is important for tourism studies applying them and discussing key areas for future research (Scott, 2020; Skavronskaya et al., 2017).

This chapter has touched upon several related concepts: consciousness, sensation, perception, attention, emotion and memory. It aims to introduce the 'Cognitive Wave' (Scott, 2020) – discussing concepts and theories from cognitive psychology and to demonstrate its usefulness for understanding mental process underlying behaviours human exhibit, especially for transfer of psychological paradigms to tourism research.