TOURISTS' DECISION MAKING IN MOTION: A SCENARIO ANALYSIS

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CERTIFICATE OF ORIGINALITY

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ABSTRACT

Information and communications technology (ICT) continues to evolve rapidly. Given the perceived ease of travel, particularly thanks to ubiquitous Internet support at destinations and location-based smartphone services, less pre-trip planning is required; tourists can adopt a more flexible approach to trip activities and rely on their smartphone to determine on-site experiences. Exposure to new information and the provision of alternative views of information spaces may inspire substantial deviations from original travel plans and trigger spontaneous needs or behaviours. Postponing decision making until the consumption phase, deviating from pre-existing plans, and engaging in unplanned behaviours have become increasingly prominent in travel. These patterns have shaped a specific type of decision making: decision making in motion. Decision making in motion, characterised by bodily movement and information processing on the go, is time-sensitive, rapid, spontaneous, and intuitive. The process involves a complex series of choices such as selecting a restaurant, finding one's way, and deciding what to do next, all of which tend to be made while consuming the destination. Within today's mobile technology era, one can reasonably assume that tourists' decision-making processes have changed accordingly. Empirical research is needed to promote theory development in this area and provide a clearer understanding of tourists' decision making in motion.

Although numerous theoretical and empirical efforts have focused on tourists' decision making since the 1950s, corresponding theories have several deficiencies. First, studies on tourists' decision making have tended to be limited to either specific stages in the travel decision-making process (e.g., the pre-trip stage) or to particular decision items (e.g., the destination choice). Little is known about tourists' on-site decision making in terms of consumption of food, attractions, routes, modes of transportation, and shopping. Second, a major gap in decision-making research

persists regarding decision making in motion. The characteristics of decision making in motion have not been adequately elucidated in the literature. Third, although several studies have recognised the influential roles of context in the decision-making process, few studies have examined the dynamic and complex interactive process between individuals, decision tasks, decision contexts, and decision strategies in natural settings. Finally, although several studies have been conducted on ICT and its relationship with decision making, smartphones—a key component of ICT widely adopted by modern tourists—have not been formally integrated into conceptual decision-making models. This study fills the void in the literature by empirically investigating the process of tourists' decision making in motion through various real-world scenarios. Following a phenomenological approach, this study adopts a qualitative research design to understand contexts, information cues, information searches, and information processing behaviours relevant to tourists' decision making in motion, as well as the role of smartphone usage in decision making in motion.

Data were collected using a process-tracing technique called verbal protocols and semi-structured, in-depth interviews. Participants who were (1) free independent visitors; (2) first-time visitors; (3) visitors who have planned at least one day for sightseeing, shopping, or both were recruited for this study. Pre-trip interviews were conducted before selected tourists began their day trips. To capture tourists' information cues and information spaces, travellers were equipped with wearable cameras and GPS data loggers. Tourists were also asked to share their thoughts aloud while exploring the city. Post-trip interviews were conducted in the evening after tourists finished their trips. Different types of data (i.e. audio records of pre- and post-trip interviews, videos of day trips from wearable cameras, audio records from tourists' think-aloud activities, tracking files exported from GPS data loggers, and written transcripts of audio records) were collected and

analysed. Nvivo 12, a qualitative data analysis software, facilitated data organisation, preparation, and analysis.

The findings delineate the process of tourists' decision making in motion. On-the-go tourists' decisions about four types of tourism products and services (attractions and places, food and restaurants, shopping and purchases, and routes and transportation) emerge within seven contextual dimensions: servicescape, social, information, intrapersonal, geo-position, time, and weather. Dimensions of tourists' immediate contexts prompt their decision making in motion. The findings revealed three information processing patterns and strategies used by tourists during decision making in motion. These approaches affect how tourists interact with information and which decision criteria they use. Smartphones appear to play unique roles in tourists' decision making in motion. The empirical results demonstrated that tourists use various smartphone functions to acquire spatial knowledge, access real-time information, and maintain local and distant social networks. Smartphone use can influence decision making by playing different roles in the three patterns of participants' information processing.

Theoretically, this study adds to the decision-making literature by identifying and investigating a prominent phenomenon in travel and tourism with limited research: decision making in motion. In response to the call for more research focusing on the dynamic and complex interactive process between individuals, decision tasks, environments, and decision strategies in natural settings, this study has discovered how tourists make decisions while on the move in real-world settings through the lens of naturalistic decision making (NDM). This study advances NDM by focusing on non-expert decision-makers, by investigating decision making in contexts that have not been captured by NDM, and by considering the influence of information technology on decision making which NDM has not yet incorporated on decision making. This study offers a

holistic understanding of multidimensional contexts in tourism destinations. The findings of this research provide a foundation for future work on tourists' contexts. Moreover, this study probes tourists' information processing in naturalistic settings. Empirical findings of tourists' information sources and rules or strategies provide a comprehensive picture of tourists' information processing. Furthermore, the present study supplements previous studies by focusing on on-the-go tourists' smartphone use and the extent to which smartphones affect their decision making. Results offer a detailed explanation of the effects of smartphones on tourists' decision making. Practically, the findings from this study provide several insights helpful to practice in the areas of destination marketing and management, and digital marketing, most notable in terms of the design of travel information services on smartphone platforms. Understanding how tourists make real-world decisions throughout a destination can help various stakeholders better support tourists' decision making. Knowledge of the multidimensional contexts within which tourists are immersed during decision making offers a foundation for constructing effective mobile systems. Furthermore, the findings of this study showed the effects of push alert functions in smartphone apps on tourists' decision making. Context-awareness and push alerts should be incorporated into travel information services on smartphones to inform tourists' decisions. The qualitative nature of this research involves some limitations. Future research could adopt quantitative techniques to test the identified variables and examine relationships between constructs. Besides the variables proposed in this study, researchers could explore other antecedents related to decision making in motion. Examples include tourists' expectations about their trips, prior knowledge of their destination, personal involvement, travel distance, and length of stay. This study provides limited information about factors supporting or inhibiting smartphone use during decision making in motion. Future studies

should examine mechanisms behind smartphone use and non-use during tourists' decision making in motion.

Keywords: Tourists' decision making; Information processing; Naturalistic decision making; Smartphones; ICTs; In motion

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CHAPTER 1 INTRODUCTION

1.1 Research Background

Information and communications technology (ICT) continues to evolve rapidly. ICT has come to influence the way in which information is generated, accessed, exchanged, and evaluated; such technology has also shaped how social relationships are formed and maintained, fundamentally transforming consumers' needs and behaviours (Buhalis & Law, 2008). The proliferation of ICT has brought considerable effects to the functions and structures of many industries, including those in the travel and tourism field. Owing to enhanced information and communication capacities afforded by ICT, tourists' travel planning and decision making are shifting in terms of flexibility, specificity, time frame, and information needs (Lamsfus, Wang, Alzua-Sorzabal, & Xiang, 2015).

Together with ICT, ubiquitous Internet support at destinations has enabled tourists to surmount geographic constraints and exploit information while on the go. Innovative location-based services available via smartphones (e.g., navigation systems, online mapping, and recommendation services) help tourists cope with unexpected circumstances and satisfy situational needs, thus supporting informed decisions at lower cognitive costs (Wang, Xiang, Law, & Ki, 2016). Given the perceived ease of travel, particularly thanks to Internet access and location-based smartphone services, less pre-trip planning is required; tourists can adopt a more flexible approach to trip activities and rely on their smartphone to determine on-site experiences (Wang, Park, & Fesenmaier, 2012; Wang Xiang, & Fesenmaier, 2014). Tourists may constantly receive push information about a destination while travelling. They can also share their travel experiences and receive immediate feedback. Tourism-related products and services encourage travellers to search

for information online, particularly when making decisions (Xiang, Magnini, & Fesenmaier, 2015). Smartphones also provide various ways of presenting information, such as through virtual reality and 2D/3D digital maps, which can influence people's perceptions and cognition. Exposure to new information and the provision of alternative views of information spaces may inspire substantial deviations from original travel plans and trigger spontaneous needs or behaviours (Becken & Wilson, 2007; Park & Fesenmaier, 2014). Unpredictability has become increasingly prevalent in travel, whether in terms of postponing decision making until the consumption phase, deviating from pre-existing plans, or engaging in unplanned behaviours. These patterns have shaped a specific type of decision making: decision making in motion.

Decision making in motion, characterised by bodily movement and information processing on the go, is time-sensitive, rapid, spontaneous, and intuitive. The process involves a complex series of choices such as selecting a restaurant, finding one's way, and deciding what to do next. To make efficient decisions, tourists on the go must terminate information searches and processing as soon as satisfactory solutions are identified, after which travellers move to the next decision frame (Jun, Vogt, & MacKay, 2010; Smith & Decoster, 2000). When tourists enter an unfamiliar destination, they encounter various situations that include brief exposure to information cues; extensive information input; and pressures related to weather, time, and other social and cultural features. Cognition has a socially embedded dimension, and thus, it is shaped by various aspects of decision problems along with social input (e.g., advertising in local tourist guides, conversations with fellow tourists, or recommendations from locals) (McCabe, Li, & Chen, 2015; Jun et al., 2010; Smith & Decoster, 2000).

As a key component of ICTs, the number of smartphone users has grown exponentially in recent years. According to a market report, 3.3 billion individuals used a smartphone in 2018 (equal

to 39% of the global population), and this figure is expected to surpass 3.8 billion by 2021 (Newzoo, 2019). Smartphones have become an integral part of everyday life, and daily usage related to individuals' routines and skills exerts a 'spillover effect' on smartphone usage during travel (MacKay & Vogt, 2012). In a tourism and hospitality context, smartphones offer tourists convenience when booking hotel rooms, airline tickets, and car rentals. These devices also provide useful and instant travel-related information without time-related or geographic constraints. Tour operators and travel guides have leveraged smartphone functionality to improve traditional services, such as by offering personalised guided tours for travel planning, navigation, and interpretation (e.g., recommender systems and context-aware mobile systems) (Kramer, Modsching & Ten Hagen, 2008). With advanced features and wide adoption, the smartphone plays a significant role in travel, including in the pre-trip (anticipatory), on-site (experiential), and post-trip (reflection) stages (Wang et al., 2012). According to the Expedia/Egencia Mobile Index (Expedia, 2016), global travellers now consider smartphones an indispensable travel companion. The index reveals that 84% of travellers wish to access information from anywhere while travelling, and 60% would be unwilling to vacation without a mobile device. Tourists can use numerous smartphone functions to satisfy various needs while on a trip (Wang, Xiang, & Fesenmaier, 2016).

Smartphones can also influence decision making in motion. Decision making involves a series of interrelated steps: recognising, searching for, and gathering relevant information; comparing and evaluating alternatives; making choices; implementing those selections; and following up (Um & Crompton,1990; Crompton, 1992; Yoo, 2005). The mobile Internet environment is uniquely suited to information acquisition, selection, communication, and the development of decision-making alternatives (Li, Yatrakis, Turner, Yen, & Hsu, 2003). Research

has shown that the wide adoption of smartphones may potentially alter relationships and the context of interactions between tourists and their physical and social environments, especially those related to decision making (Dickinson, Ghali, Cherrett, Speed, Davies, & Norgate, 2014; Lamsfus, Xiang, Alzua-Sorzabal, & Martín, 2013; Wang et al., 2014). Anckar and D'incau (2002) have identified value-adding features of mobile technology for tourists on the move. First, tourists can use smartphones to fulfill time-critical needs when immediacy is either desirable or essential, such as receiving alerts about an altered transportation schedule while travelling. This feature signifies the importance of the 'always-on' connectivity of mobile devices. Second, smartphones can facilitate tourists' spontaneous needs that are internally awakened, leading to decisions that do not require careful considerations; such decisions can also be hedonic, efficiency-related, location-specific, or time-critical. Third, mobile devices support entertainment needs by creating an opportunity to kill time and entertain oneself while on the move. Fourth, smartphones provide opportunities to capitalise on downtime and optimise time usage during a trip. Fifth, location-based travel services accessible via smartphones can satisfy tourists' mobility-related needs when on the go (Anckar & D'incau, 2002). These values are particularly relevant to tourists' decision making in motion, which involves information processing when moving through complex spatial environments.

Within today's mobile technology era, in which tourists are ever more sophisticated and empowered, one can reasonably assume that tourists' decision-making processes have changed accordingly (McCabe et al., 2015). This evolution inspires questions regarding the extent to which existing decision-making models can account for shifts in tourists' decision-making practices. Empirical research is needed to promote theory development in this area and provide a clearer understanding of tourists' decision making in motion.

1.2 Research Gaps

Numerous theoretical and empirical efforts have focused on tourists' decision making since the 1950s, along with variance models that conceptualise accompanying determinants, mediating variables, and phases (Sirakaya & Woodside, 2005). Although corresponding theories have offered valuable insights into consumer behaviours and decision prediction, they have several deficiencies. First, studies on tourists' decision making have tended to be limited to either specific stages in the travel decision-making process or to particular decision items. Studies on travel planning (Hyde, 2008) and pre-trip decision making (Decrop & Snelders, 2005) have revealed that a substantial proportion of decisions are made after arriving at a destination. In contrast to pre-trip decision making, which is characterised as a deliberate, purposed, and reasoned process involving extensive information searches, tourists employ a free-hearted, hedonistic, and simplistic process in on-site decision making (Hyde, 2004; Decrop & Snelders, 2005). Moreover, tourists' decision making comprises a multi-faceted process involving a variety of sub-decisions about different travel products. A hierarchy of multiple travel-related decisions follows processes that vary in decision timing and flexibility (Fesenmaier & Jeng, 2000). However, little is known about tourists' on-site decision making in terms of consumption of food, attractions, routes, modes of transportation, and shopping.

Second, a major gap in decision-making research persists regarding decision making in motion, which is becoming increasingly prominent in travel. In contrast to rigorous, rational cognitive processes and utilitarian needs emphasised in conventional models, decision making in motion appears free-hearted, hedonic, opportunistic, and unplanned. Conventional models not only underestimate the affective or hedonic motives of tourism consumption but also fail to capture decision-making behaviours that occur when tourists are not highly motivated (Hyde, 2008).

Moreover, most models of tourists' decision making focus on input-output variables rather than cognitive processes. These models fail to consider the influential roles of decision-making contexts, and the spontaneous nature of decisions (e.g., unplanned behaviours). All told, the characteristics of decision making in motion have not been adequately elucidated in the literature.

Third, few studies have examined the interactive process between tourists, decision tasks, decision contexts, and decision strategies in real-word settings (Lipshitz, Klein, Orasanu, & Salas, 2001). While travelling in a destination, tourists often make spontaneous decisions about a range of tourism products and services, for which factors (e.g., available processing time, cognitive resources, the importance of consequences, and personal relevance of each potential decision) may differ substantially. Various aspects of decision making (e.g., information searches and processing) interact with tourists' task characteristics, decision contexts, and personality characteristics to evoke distinct processes of integrating information to generate preferences and choices (Bettman, Luce, & Payne, 1998). A better understanding of such a dynamic and complex interactive process is needed to inform theory and offer implications for practitioners.

Finally, although several studies have been conducted on ICT and its relationship with decision making, smartphones—a key component of ICT widely adopted by modern tourists—have not been formally integrated into conceptual decision-making models. Research has revealed the value of ICT use in improving the efficiency of information searches and processing as well as overall decision-making effectiveness; such studies may incorporate ICT as a decision and/or communication facilitator (Huber, 1990; Molloy & Schwenk, 1995; Teng & Calhoun, 1996). Despite the potential for smartphones to facilitate information acquisition and processing activities by offering real-time, extensive, relevant information and interpretation (Tussyadiah, 2016), empirical research examining the effects of smartphones in the travel decision-making process

remains scarce. The role of smartphones in tourists' decision making in motion remains unknown and warrants further investigation. Aforementioned gaps in the literature comprise the impetus for this thesis.

1.3 Research Questions and Objectives

This thesis seeks to extend knowledge of today's tourists within a smartphone technological information context with a particular focus on the emergence of decision making in motion, which has been largely neglected in tourism research. This study empirically investigates tourists' decision making in motion through various real-world scenarios, with an emphasis on decision contexts, information processing behaviours, and the roles of smartphone usage (i.e., how to trigger, facilitate, or inhibit related decision processes). In particular, this study focuses on the decision-making processes of individuals or groups of tourists moving through an urban environment with hyper-dense information and tourism-relevant products, heightened mobility options, and great Internet connectivity.

The fundamental research problem that needs to be addressed is: How do tourists make decisions in motion? To address this problem, this study investigates the following questions: (1) How do decisions emerge while tourists are exploring a destination? (2) How do tourists process various information cues presented in different formats while in motion? and (3) How do smartphones affect the decision-making process?

This thesis aims to achieve three research objectives:

a) To investigate the context of decision making in motion during trips;

b) To identify the information sources, information processing strategies, or heuristics used by tourists during decision making in motion under each scenario; and

c) To examine the roles of smartphones during decision making in motion (i.e., how to trigger, facilitate, or inhibit this type of decision making).

1.4 Significance of the Study

Whereas previous tourism studies have often excluded presumably important components in the travel decision-making process, this thesis empirically investigates a neglected topic in the literature: tourists' decision making in motion. Although the body of research on the relationship between ICT and decision making has grown, no research has yet addressed the effects of smartphones on decision making in motion. The knowledge of tourists' decision making within the context of smartphone technology can help academics and practitioners learn and develop new ideas about how today's tourists make decisions.

This research adopts an interdisciplinary perspective to explore tourists' decision making in motion by identifying relevant concepts from diverse disciplines (consumer research, psychology, information technology). Based on an empirical investigation of the interactions between decision tasks, decision contexts, information cues, decision makers' information processing strategies or heuristics, and smartphone usage, this thesis provides a rich description of the underlying structure of the travel decision-making process in real-world scenarios. Theoretically, this study expands the tourism decision-making literature in three main ways: to examine on-site decision making regarding different travel products, to address the existence of time-sensitive, rapid, spontaneous, and intuitive decision-making processes, and to provide

knowledge and research directions that are more relevant to current tourist behaviour trends and patterns.

Practically, this study provides managerial implications regarding how to best support tourists' decision-making processes while travellers are on the go. Knowledge about tourists' decision making under specific scenarios will help tourism businesses cater more effectively to tourists' spontaneous and situational needs and devise strategies to influence tourists' decisions. Furthermore, findings from the present study can contribute to the development of innovative mobile systems for travel and tourism, including tourism applications and websites. As on-the-go tourists are constantly sending signals, generating new information, and engaging with social networks at their locations, contextual information will provide a foundation for designing effective mobile systems that provide innovative and customised services and experiences.

CHAPTER 2 LITERATURE REVIEW

This chapter presents a detailed review of the literature relevant to this study. Section 2.1 examines the nature of leisure tourism and independent tourists to outline tourists' diverse experiences and behaviours. Then, the section surveys the literature regarding travel planning and unplanned behaviour and tourist spatial-temporal behavioural patterns within a destination. Section 2.2 reviews studies on tourists' decision making relative to decision-making models, information searches, and information processing. Section 2.3 examines the tourism literature on mobile information technology and its impact on travel.

2.1 Leisure Tourists and Travel Behaviour

2.1.1 The Nature of Leisure Tourism and Independent Tourists

This thesis focuses on an aspect of consumer behaviour in tourism: on-the-go leisure tourists' decision-making processes about travel products. Discussions around tourist behaviour, thoughts, and experiences must begin with an examination of the nature of leisure tourism and independent tourists.

The phenomenon of tourism is derived from an awareness of the outer world and a willingness to cross the boundaries of one's native habitat. Tourism is also characterised by one's ability to adapt to new environments and become interested in novel things, sights, and customs (Cohen, 1972). Human beings are inherently curious and possess an innate desire to explore the world around them. Leisure travel offers opportunities for people to appreciate novelty apart from daily life. Iso-Ahola (1982) suggested that leisure travel behaviour results from the interplay of two motivational forces: escaping everyday tedium and seeking psychological rewards through

travel. Psychological benefits can arise from a sense of self-determination (i.e., one's ability to exercise freedom in selecting tourism activities) and feelings of mastery or competence (Mannell & Iso-Ahola, 1987). Research has suggested that tourists' behaviours balance a desire for complexity (i.e., novelty) with a desire for consistency (i.e., routine) (Mayo & Jarvis, 1981; Cohen, 1972). The success of package tours lies in providing a blend of novelty and familiarity. As people travel overseas, they become more confident. Their needs thus become sophisticated and diversified, leading to independent travel (Hyde, 2008). Independent tourists have greater decision-making autonomy; as such, they can be flexible in their travel arrangements without necessarily pre-booking trip components.

Given relevant motives and intentions, leisure tourists' behaviours are distinct from goal-directed intentional behaviours (Smallman & Moore, 2010). Holbrook and Hirschman (1982) proposed that the consumption of products such as leisure tourism involves hedonic, symbolic, aesthetic, and experiential aspects. Such consumption involves the pursuit of hedonic, emotional benefits; it does not aim to satisfy utilitarian, functional needs, or solve problems. Emotion and affect are consequences of cognition and may occur alongside behaviour. Furthermore, an independent tourist's experience is often vague when tourism behaviour begins and remains dynamic throughout travel. Revisions to tourists' motives line the behavioural trajectory throughout tourism. Tourists' final behavioural patterns are imprinted with environmental qualities as their behaviour develops (Smallman & Moore, 2010). The experiential nature of leisure travel consumption, the openness of tourists' behaviours, and contextual influences imply that many judgments and decisions occur intuitively, affectively, and spontaneously. The outcomes of tourist behaviour are products of the behavioural response to these inherent and external factors.

2.1.2 Travel Planning and Unplanned Behaviours

Choosing and purchasing vacation products involves interrelated, sequential decisions over an extended time (Stewart & Vogt, 1999). Decision planning plays an important part in these processes, referring to a predetermined course of action in anticipation of specific needs or problems (Park & Lutz, 1982). Travel consumers often face uncertainty around future purchase outcomes due to the intangible nature of tourism products (Hsu & Lin, 2006). Tourists may be afraid of making poor decisions that result in disappointing purchase experiences; contingency plans are developed to mitigate such risks. Especially for first-time travellers, extensive planning can minimize the perceived risks of travel (Van Raaij, 1991). Planning can also increase anticipatory excitement (Zalatan, 1996), and improve overall trip quality (Fodness & Murray, 1997).

In research on travel planning and decision making, travel plans have often been conceptualised as a subset of tourists' pre-trip decisions likely to be acted upon (Cox, Burgess, Sellitto, & Buultjens, 2009). However, such conceptualisations focus on the outcomes of the planning process rather than what led to those outcomes (Hyde, 2008). A decision plan may comprise behavioural intentions of varied specificity and scope. Wilkie (1994) distinguished 'specifically planned purchases' from 'generally planned purchases'. Specifically planned purchases occur when a consumer has plans to buy a specific item. Generally planned purchases are made on advance decisions to purchase a product rather than a specific brand. There is also a planned–unplanned continuum. In the middle of the continuum, people tend to have general plans; such is the case for most consumers (Chang, Stansbie, & Rood, 2014; Strack, Werth, & Deutsch, 2006). The specificity of travel planning is highly contingent upon individuals' knowledge, personal traits, task characteristics, and travel-planning stages (Pan & Fesenmaier, 2006). Planning

horizons, referring to the extent to which tourists plan for specific elements of a vacation, vary substantially based on several factors: trip duration, travel distance, travel purpose, first-time versus repeat travel, desire for planning, and tourists' culture (Gitelson & Crompton, 1983; Lo, Cheung, & Law, 2002; Zalatan, 1996).

Research has shown that aspects of a trip plan developed prior to a trip are often modified, and sometimes completely revamped, throughout the decision-making process (Becken & Wilson, 2007; Hyde & Lawson, 2003; March & Woodside, 2005; Park & Fesenmaier, 2014; Stewart & Vogt, 1999). Many characteristics can spur plan changes: shifting circumstances, preferences, and constraints; and inconsistencies between outdated and new information or choice alternatives (Becken & Wilson, 2007). When unanticipated events make a plan difficult to execute or alter travellers' choice criteria, tourists simply develop a new decision plan. Significant disparities between travel plans and actual behaviours have been widely noted. Stewart and Vogt (1999) revealed that plans developed before a trip are often altered with fewer actuated elements, especially for on-site activities. Pre-plans (e.g., length of stay, travel party, and travel mode) are normally realised, whereas pre-planned accommodations and activities are often adapted during a trip. Elaborated plans can be actuated during the vacation period but change continuously through a cycle of actuation-failure-revision-actuation (Becken & Wilson, 2007). The relationship between travel plans and travel behaviour has been studied extensively. Corresponding classifications include planned and realised tourism behaviours or unplanned and realised tourism behaviours. However, this ongoing, interactive adjustment process has not been adequately elucidated in the literature.

Travel planning and unplanned consumption of intangible tourism services differ from impulsive purchases of tangible products. Experiential consumption often involves hedonic rather

than functional benefits (March & Woodside, 2005). An integral feature of leisure travel includes open-ended exploration, perceived freedom of choice, autonomy over the travel process, and enjoyment of an unpredictable journey (Deci & Ryan, 2000; Hyde & Lawson, 2003). As discussed earlier, novelty seeking is a fundamental motivation behind leisure tourism and a determinant of tourist behaviour (Cohen, 1972; Crompton, 1979; Dann, 1981; Mannell & Iso-Ahola, 1987). Novelty-seeking behaviour is also linked with a preference for experiencing new and unfamiliar environments (Gitelson & Crompton, 1983). For leisure tourists wishing to experience something different and adventurous, they may avoid making precise plans to preserve spontaneity and risk. Hyde (2008) noticed that even for the "most planned" independent travellers, many elements in their vacation itinerary are unplanned.

Moreover, leisure destination settings create a consumption condition more likely to induce unplanned behaviours. Such conditions include an unknown consumption environment, positive consumption outcomes, constraints on time and effort, and multiple purchased items (Becken & Wilson, 2007). Tourists who travel to an unfamiliar destination tend to search for new information. They also make alternative choices if their expectations of a place are not met or when encountering unexpected scenarios. All tourists research and explore their destinations; therefore, immediate, unplanned behaviours occur when tourists respond to on-site stimuli. Within today's ICT environment, tourists' information search and decision-making behaviours are becoming increasingly dynamic. Tourists' needs are thus met with unplanned solutions. Travellers also tend to be more spontaneous during vacations to be present at the moment. This behaviour may lead to substantial changes in their travel plans (Wang, Xiang, & Fesenmaier, 2014).

The above discussion emphasises that tourist planned/intentional and unplanned/realised behaviours are adaptive and dependent on contingency factors. These features include

environmental and informational factors (Becken & Wilson, 2007), tourists' antecedent factors (Laesser & Dolnicar, 2012; March & Woodside, 2005; Gitelson & Crompton, 1983; Cooper, 1981; Lo et al., 2002), along with tourism product categories (Chang et al., 2014). Research using hypothetical trips or taking a retrospective approach often does not consider such factors; as a result, findings do not necessarily reflect actual behaviours, or outcomes of decision making (Hwang, 2010). Consideration of the context within which the tourist's behaviour takes place allows examination of the factors encountered during the decision-making process.

2.1.3 Tourist Spatial-Temporal Behaviour Patterns within a Destination

Every tourist behaviour takes place in time and space (Huang & Wu, 2012). Scholars in tourism have employed a spatial-temporal approach to study tourist behaviour patterns (e.g. Cooper, 1981; Grinberger, Shovala & McKercher, 2014; Huang & Wu, 2012). Time is an important determinant of patterns of tourist behaviour; it is a dynamic and limited resource. As the tourist has to utilise and structure his/her time resource in the most efficient way possible, time "acts as an independent variable against which tourists can measure their progress in terms of sites visited and enjoyment derived" (Cooper, 1981, p. 360). Thus, time as reflected in participation in activities, and space as reflected in movement, are substitute resources (Grinberger et al., 2014).

Time geography (Hägerstrand, 1970) provides an adept way to understand spatial–temporal patterns of tourist behaviour (such as which activities tourists participant in and where; how tourists sequence their visits; how long tourists stay in each site) (Grinberger et al., 2014). Each trip is carried out within three groups of time-space constraints of the environmental structure: *authority constraints*, *capacity constraints*, and *coupling constraints*. *Authority constraints* refer to the law, industry rules and regulations, social norms, etc. *Capability constraints* are limitations

of an individual that stem from his/her biological construction and/or personal resources (e.g. physical condition, state of mood, money). *Coupling constraints* are those restraints of the individual because of other individuals (e.g., family members, friends, travel companions) (Hägerstrand, 1970). These constraints define the time and space resources available to tourists which in turn dictate tourist's allocation decisions regarding time–space resources. Although time geography mainly deals with constraints or barriers dictating individuals' behaviours rather than the decisions, time-space constraints faced by individuals can be regarded as delimiting the boundaries to their decisions (Grinberger et al., 2014). Thus, time geography can be used as a platform to analyse and understand tourist spatial–temporal behaviour and allocation decisions regarding time and space resources.

Inter-destination and intra-destination patterns describe tourist behaviours and movements at different scales; yet, the study of intra-destination tourist behaviour and decision making is relatively limited (McKercher & Lau, 2008; Huang & Wu, 2012). Tourist behaviour at a destination level tends to be highly complicated and individualistic. Each tourist chooses activities and paths to create a personalised itinerary that suits the unique needs and interests (McKercher & Lau, 2008). Previous research has noted a multiplicity of intervening variables that could influence tourist intra-destination behaviour. The earlier discussion suggests that time budget influences how tourists explore a destination in terms of the participation in activities, the location and duration, and the movement between them (Grinberger et al., 2014). Tourists on greater time budget often have higher flexibility in the itinerary (Shoval & Raveh, 2004). As such, their movement and decision making tend to be less predictable.

Tourists may display different characteristics of behaviour patterns within a destination. The knowledge of the destination, personal power of control (Walmsley & Jenkins 1991), as well

as tourist motives (McKercher & Lau, 2008) may exert an influence on their exploration patterns. According to Haldrup (2004), tourists encounter with places, framed within social and cultural narratives, can inform the way tourists inhabit, navigate and move through space. Furthermore, the spatial layout of the destination such as the number and spatial distribution of attractions, the spatial relationship between accommodation and attractions, as well as transportation accessibility can also influence tourist behaviour (Lew & McKercher, 2006). These factors thus should be taken into account in any study of tourists' on-site behaviour and decision making.

2.2 Tourists' Decision Making

2.2.1 Models of Tourism Decision Making

The rapid proliferation of behavioural decision theories in the tourism literature began in the 1950s. This research explosion was accompanied by empirical experiments designed to test corresponding theories. Decision making in tourism has unique characteristics compared to other products. Conventional consumer behaviour models (i.e., grand models) cannot reflect fundamental differences between purchases of manufactured goods and tourism services (Smallman & Moore, 2010). Given the intrinsic complexity of tourism services, researchers have adopted various perspectives to conceptualise determinants, phases, and mediating variables in tourists' decision-making process. Viewpoints include a broader behavioural perspective; a narrower choice-set perspective; and a hierarchical and evolutionary perspective.

2.2.1.1 Tourism Decision Making: A Behavioural Perspective

Many tourism decisions involve relatively high uncertainty due to the intangible nature of tourism services (Decrop, 2006). Such decisions depend heavily on the decision context and task

variables, which generally involve trade-offs between the desirability and likelihood of consequences. Normative and descriptive decision-making models have been constructed. In some, individuals aim to make optimal decisions; in others, individuals simply accept satisfactory solutions to task problems (Sirakaya & Woodside, 2005). Fundamental travel decision-making models generally consider tourists' decision making to be a sequential process. This process involves extensive, complex, risky choices when procuring tourism services. As the decision maker passes through a series of stages, he/she is affected by several functional (or utilitarian) and emotional factors. A broader behavioural perspective has been adopted to depict this process in light of numerous contingent variables.

Clawson and Knetsch (1966) developed an early model of travel decision making. They proposed a five-stage outdoor recreation experience model to delineate the vacation experience and decisions from a macro perspective. Their model opens with the anticipation stage, followed by travel to the site, on-site experience, activities, travel home, and recollection. Each stage attempts to explain how an individual reaches the ultimate decision stage. Although this model does not capture individual decisions at the micro level, it can predict aggregate demand to travel sites. Wahab's (1976) model recognises the unique characteristics of tourism products or services. Accordingly, the model defines risk, extensive problem solving, and advance planning in tourism decisions. Variables such as needs, motivations, destination image, spontaneity of the purchase decision, and risk and uncertainty are included as well. Drawing from grand models, a tourist in Wahab's model is regarded as a rational decision maker who assesses the costs and benefits of actions before making a purchase decision. Furthermore, Wahab's model mainly focuses on the individual as the decision-making entity but overlooks interpersonal, social, and family influences.

Some researchers have begun to recognise that tourists' decision making is driven by social and psychological factors (Schmoll, 1977; Mayo & Jarvis, 1981). Decisions are also contingent upon opportunities and constraints. According to Moutinho (1987), tourism decisions are highly affected by external forces, especially influences from others (i.e., social influences). These influences can be grouped into four major areas: role and family influences, reference groups, social classes, and culture and subculture. A complex travel decision model has been constructed based on motivation. In this case, a tourist's needs, desires, and expectations about a decision problem are shaped by travel stimuli along with social and personal determinants. Although this complex model reveals the temporal order of various forces affecting decision behaviours, it is challenging to test empirically.

Some scholars have focused on joint or group decision-making activities when travellers purchase and consume tourism products. Van Raaij and Francken (1984) provided a vacation-sequence model recognising the interactions of household factors (i.e., lifestyle, power structure, role, and decision-making style) and individual factors (e.g., attitude and aspirations). Presumably, each family member's behaviour and role may vary throughout the decision-making process. Similarly, Jenkins (1978) argued that family members play different roles in various decisions. Husbands tend to dominate decisions on vacation timing and spending, whereas children influence activity selections and length of stay. Aligning with previous findings, Mottiar and Quinn (2004) concluded that overall vacation consumption is largely a joint decision. Essentially, women and men possess distinct roles and levels of influence in purchase decisions throughout the consumption process.

Woodside and MacDonald (1994) provided a system framework of customer choice processes for several vacation components (i.e., destination, sub-destination accommodations,

activities, attractions, travel routes, dining, self-gift, and purchases). They noted that tourists' choices are not always rational, challenging the proposition of utility maximization in many decision-making models. Qualitative data collected through an empirical study can offer greater insight into individuals' decision-making styles. As suggested by Woodside and MacDonald (1994), tourists' choices of travel-related products or services depend on a sequential process; however, little is known about the temporal sequences of tourists' selections regarding the authors' proposed vacation components.

Tourists' decision making involves extensive, risky sub-decisions that rely on context cues where information can change rapidly. Therefore, it is impossible to fully understand decision making by solely examining final decisions (Svenson, 1996). An investigation of the process between decision inputs and decision outputs from a broader, behavioural perspective can enrich our knowledge of relationships among factors behind decisions. Such findings can provide a foundation for further exploration of tourists' decision-making processes.

2.2.1.2 Tourism Decision Making: A Choice-Set Perspective

Related to major model assumptions from a behavioural perspective, models using the choice-set perspective attempt to depict tourists' decision-making processes differently. Choice-set models conceptualise the sequential nature of decision making, which is composed of a constrained set of alternatives. These models also consider the nature and size of choice sets at each stage of the decision-making process (Crompton, 1992).

Howard (1963) first introduced the choice-set concept in the customer behaviour literature; many researchers have since elaborated upon it. Choice-set approaches have been widely applied by tourism scholars, especially in foundational destination choice models. According to the choice-

set theory, a potential tourist develops an initial set of destinations from an early consideration or awareness set, which includes an array of destination alternatives. Then he/she forms a late consideration or evoked set with an ever-dwindling number of alternatives; this set is reduced over time via a filtering process. Finally, one destination is selected from the late consideration set as the final choice. Rather than being a primarily conceptual or theoretical work, choice-set models elicit more applicable results and offer a practical perspective on important issues such as destination attractiveness and marketing. Findings can be advantageous for destination marketers. Practitioners can identify market potential and segment target markets based on choice sets. However, some scholars have argued that choice-set theories are overly deterministic (Sirakaya & Woodside, 2005).

Woodside and Lysonski (1989) proposed a destination choice process beginning from destination preferences, visit intention, and a final choice. This process is influenced by the marketing mix and traveller variables. According to the researchers, the final choice is a function of visit intention where situational variables mediate the interaction of intention and choice. Woodside and Lysonski's (1989) model remains one of the most influential in tourism decision-making literature. Their approach includes variables largely neglected in previous models, such as affective associations, traveller destination preferences, and situational variables and their impacts. Nevertheless, some constructs and relationships in the model require further operationalisation and testing (Sirakaya & Woodside, 2005).

Um and Crompton (1990) outlined another important framework using the choice-set structure. In their model, the destination choice process consists of three stages: composition of an awareness set, the evolution of the evoked set from the awareness set, and final destination selection from the evoked set. Each alternative in a potential tourist’s awareness set is generated

through passive selective perception. The evoked set is formed through active solicitation of information acquired through experience, media, family, friends, and other sources. The formulation process of the evoked set is influenced by two inputs: internal inputs comprising the socio-psychological set (i.e., motives, attitudes, values, and personal characteristics); and external inputs, namely situational constraints. This approach is unique in that it conceptualises and empirically tests the role of attitude as a useful predictor of a tourist's final decision in an actual decision-making situation. Attitude is defined here as the difference between perceived inhibitors and facilitators, particularly in accommodating situational constraints and satisfying motives for leisure travel.

A general consensus among behavioural and choice-set models is that tourists' decision-making process is sequential. Accordingly, it can be broken down into a series of well-defined stages: problem recognition, generation of goals and objectives, formulation of a set of alternative objects, searching for information about potential alternatives, evaluation of alternatives, the final choice among alternatives, action upon the decision, and provision of feedback for future decisions. Earlier stages condition subsequent stages. This process is commonly portrayed as a funnel, affected by a number of stimulus inputs. Such inputs include the following: internal or psychological factors (e.g., attitudes, values, lifestyles, images, motivations, beliefs, intentions, personal traits, and lifecycle stage); external variables (e.g., constraints, destination pull factors, marketing mix, environmental stimuli, influences of family members and reference groups, culture and subculture, social class, and household-related variables); the nature of the trip (e.g., party size, travel distance, and trip duration); and affective variables (e.g., mood and feelings during the trip and post-purchase evaluations). The influences of these factors vary throughout the process, and

ultimate choice decisions are determined by the interactions among them (Sirakaya & Woodside, 2005).

Overall, these models contribute to the identification of the key components underlying the decision-making process. These components are eventually transformed into attitude and intention through cognitive processing, which determines purchase decisions (Yoo, 2005). However, relevant models tend to focus on outcome stages rather than the mental mechanisms underlying the process. Distinctive characteristics of tourism services have been found to lead to different decision-making processes. Even so, conventional tourist decision-making models rely heavily on grand models as a theoretical foundation. Many fail to integrate the unique characteristics of tourism to explain tourists' decision making (Sirakaya & Woodside, 2005). Another significant issue with conventional models stems from the scope or definition of tourism products. Much of the work on tourists' decision making has dealt with a single aspect, usually travel destination choice. Studies also tend to concentrate on the pre-trip stage, particularly concerning informational input into rational decision-making processes (Hyde, 2004; Kah & Lee, 2014). However, tourists' decision-making stages may repeat or occur concurrently when selecting destinations, accommodations, itineraries, and so on (Huang, Goo, Nam, & Yoo, 2017). Some stages in conventional models may be omitted if insufficient information is available about an alternative. Furthermore, tourists may skip the alternative stage and emphasize the post-purchase evaluation stage instead (Crozier & McLean, 1997). Tourist decision making may, therefore, be iterative rather than simply sequential.

2.2.1.3 Tourism Decision Making: A Hierarchical and Evolutionary Perspective

Recent tourism choice and decision-making research has offered an alternative view of travel decision making as an evolving process. Travel decisions consist of bundles of sub-decisions that vary in decision timing and flexibility. Fesenmaier and Jeng (2000) proposed a hierarchy of tourists' decisions ranging from relatively inchoate and planned decisions, from 'looser' sets of decisions to almost entirely 'spontaneous' decisions. Their multistage hierarchical model consists of the core, secondary, and tertiary decisions. *Core decisions* refer to choices of destinations, travel dates, the composition of the travel party, accommodation, route, and travel budget, which are usually planned before the trip. *Secondary decisions* refer to choices of secondary destinations, activities, and attractions; these also tend to be made before departure but are subject to change. *Tertiary decisions* regarding gifts/souvenir purchases, dining, rest stops, and shopping are flexible and considered in the en-route or on-site phrase.

Jeng and Fesenmaier (2002) identified three characteristics of travel decision making: multidimensionality, sequentiality, and contingency. *Multidimensionality* suggests that travel decision making is a complex process involving multiple decisions. *Sequentiality* portrays travel decision making as an evolving sequence. *Contingency* indicates that decisions made early in the decision-making process limit tourists' choices for later decisions. Hyde (2004) and Decrop and Snelders (2005) proposed a duality in vacation decision making: pre-trip decision making (e.g., vacation destination) comprises a deliberate, purposed process involving extensive information searches from multiple resources and comparison of alternatives. This process is common in typical decision-making models. By contrast, decision making during vacation is far more complicated; it involves a range of decisions related to food, attractions, routes, transportation, and

shopping. On-vacation decision making is more hedonistic than pre-trip decision making, representing a less deliberate and rather simplistic process.

Building upon the notion of tourism decision making as a hierarchical process, Hyde (2008) provided a model of independent travel decision making when choosing elements of one's vacation itinerary (Figure 2.1). Hyde (2008) noted that independent travellers often have an evolving itinerary rather than a fixed schedule. A temporal sequence of choices in tourism services also applies during vacation, starting from decisions about sub-destinations followed by those related to the travel route, attractions, and activities. Specifically, attraction and activity choices are based on balancing heuristics expected from experiencing these attractions and activities versus time constraints and costs. This model frames the key feature of independent travel as a desire for flexibility and experiencing the unplanned by avoiding planning and delaying decision making.

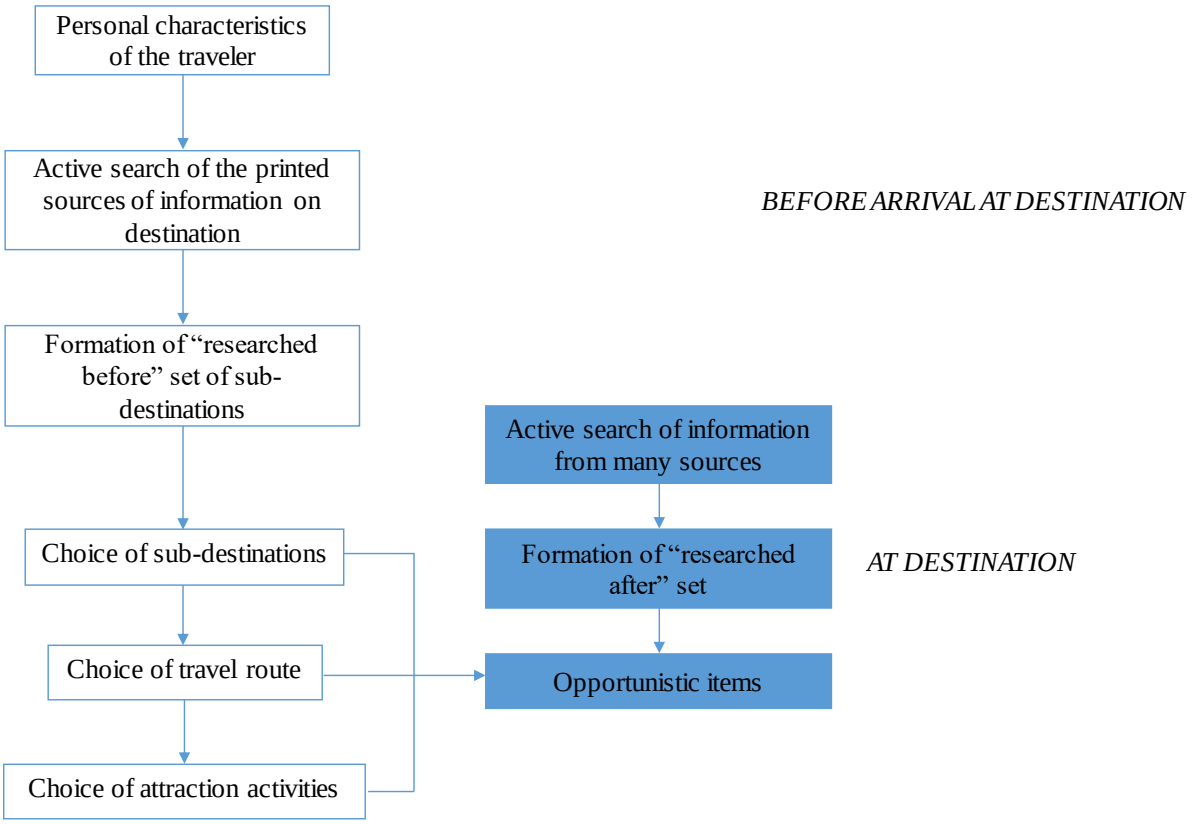


Figure 2. 1 A model of independent travel decision making for the choice of the vacation itinerary (Hyde, 2008)

This stream of research suggests that tourism decision making follows a complex, dynamic, evolutionary, and adaptive process composed of temporal, emotional, and successive levels. Research has demonstrated that pre-trip and on-site decision making follow different processes (Hyde, 2004; Decrop & Snelders, 2005). Decision making during the consumption stage (i.e., en route and on-site) is dynamic such that later decisions are contingent upon earlier ones; this association contributes to unplanned, hedonic, opportunistic, and impulsive characteristics in tourists' in-destination behaviours (Hyde, 2008). In the destination, tourists are exposed to complex environments with obstacles. Examples include brief exposure to information cues, vast

information input, and constraints due to weather, time, and other social actors, all of which complicate decision making. Therefore, different purchase and use contexts should be considered to gain a comprehensive understanding of tourists' decision-making process. However, tourists' decision-making research has overlooked the dynamics of decision-making contexts. The scholarship has also glossed over differences among travellers when responding to situations during travel (DiPietro, Wang, Rompf, & Severt, 2007; McCabe et al., 2015). Despite increasing interest in tourists' on-site behaviours and decision making, little research has investigated key cues underlying the decision-making process and decision makers' heuristics (Smallman & Moore, 2010). More empirical evidence is needed to understand the dynamic interactive process between individuals, decision tasks, the environment, and decision strategies in natural settings (Lipshitz et al., 2001).

The prior discussion has revealed several fundamental problems in tourists' decision-making models. First, rigorous, rational cognitive processes are generally assumed or implied but neglect experiential, hedonic, and subjective aspects of decision making. Second, most models conceptualise tourists' decision making as an input-output process to either explore relationships between attributes (input) and decision outcomes (output) or investigate relationships between psychological factors (input) and intentions (output) (McCabe et al., 2015). These models fail to consider prominent social characteristics of tourists' behaviours, the influential roles of decision-making contexts, and the spontaneous nature of decisions (e.g., unplanned behaviours) (Decrop & Snelders, 2005). The third issue is related to the limited scope of tourism products included in decision making. Most studies have only focused on specific tourism products or travel stages. Scarce research has traced tourists' on-site decision making in real-world settings. The present

study builds upon these models of tourism decision making, specifically as a hierarchical and evolutionary process, to offer a more holistic picture of tourism decision making.

2.2.2 Tourists' Information Search and Information Processing

Travel information is essential to a trip; it can sensitize the idea of taking a vacation and evoke fantasies about the trip. Moreover, gathering information about destinations can facilitate travel planning and decision making (Hyde, 2008). Information integration theory suggests that individuals make psychophysical and value judgments based on a complex process and that those judgments are influenced by the received information. Therefore, tourists' final choices are likely dependent on the quantity and quality of information available to and used by them (Fodness & Murray, 1997, 1999). Compared to information searches for other types of products, travel information searches comprise a dynamic process for an extended period. These searches often involve multiple information sources in response to internal and external contingencies (Fodness & Murray, 1997, 1998).

Consumer information search behaviour has been studied under the assumption that individuals are goal-directed; as such, they acquire and process information in a problem-solving manner. Needs, especially those related to information, are influenced by consumption and information exposure, which play major roles in the information search and decision-making process (Bettman, 1979). Aesthetic, visual, novelty, and hedonic needs are similarly important in this process (Vogt, Fesenmaier, & MacKay, 1994). Vogt and Fesenmaier (1998) expanded the functional information search model to include experience and emotion-driven phenomena. A variety of needs for information searches in tourism contexts have been identified, beyond immediate functional or utilitarian needs for a particular purpose or purchase. Hedonic needs arise

from psychological and experiential experiences during information searches and decision making. Aesthetic needs are intangible, abstract, nonutilitarian, and self-evoked. As opposed to routinized purchase and information search behaviours, innovation needs are related to an object's novelty. The last identified type of need is sign needs, denoting social, interpersonal, and symbolic aspects of information acquisition. Vogt and Fesenmaier (1998) suggested that tourism information should appeal to these salient needs by focusing on different aspects of products.

To satisfy diverse needs, tourists appear to acquire and use information systematically to make effective decisions about accommodations, attractions, activities, and restaurants. Tourists also employ numerous strategies involving mental processes ranging from information acquisition, selection, combination, and judgment to utilization (Jun, Vogt, & MacKay, 2007; Jun et al., 2010; Stewart & Vogt, 1999). The selectivity of information sources is an essential part of information searches because tourists cannot process all available information in a particular situation (Bettman et al., 1998).

The consumer literature has identified several underlying dimensions of tourism information sources, namely spatial, temporal, and operational dimensions (Fodness & Murray, 1997, 1998, 1999). The spatial dimension distinguishes internal information sources (accessing memory contents) from external information sources (acquiring information from the external environment) (Fodness & Murray, 1999). Past experience in relation to certain travel products provides a fundamental basis for internal sources of travel information. When internal sources fail to provide adequate information, tourists often turn to external information sources such as friends and relatives, tourism information centres, brochures, guidebooks, and travel agents (Lyu & Hwang, 2015). The temporal dimension separates sources used primarily for ongoing searches (building up a knowledge base for unspecified future purchase decisions) from sources specifically

related to pre-purchase activities (responding to a purchase problem) (Fodness & Murray, 1999). The operational dimension reflects the relative effectiveness of information sources for problem solving and decision making (complementary or substitutive relationships); in this dimension, contributory sources are differentiated from decisive sources.

Studies of tourists' information searches have indicated that travellers employ different risk-reduction strategies (e.g., high reliance on personal sources such as word-of-mouth, personal recommendations, endorsements, and testimonials). These sources greatly inform tourists' decision making (Gitelson & Crompton, 1983; Guseman, 1981). Furthermore, several factors may account for diversity in the amount of searching and the effectiveness of information sources. These factors include the type of tourist, personal traits, level of decision involvement, market location, and cultural and situational forces (Fodness & Murray, 1998; Money & Crotts, 2003). In addition, tourists' information search patterns vary by travel product characteristics, particularly distinctive risk and complex attributes (Beldona, Morrison, & O'Leary, 2005; Fodness & Murray, 1999; Jun et al., 2007; Jun et al., 2010; Stewart & Vogt, 1999).

Beldona et al. (2005) categorised tourism products into low- or high-complex products based on the complexity of information evaluation. *Low-complex* products refer to standardized services such as flights, accommodations, and car rentals, which are simple to evaluate. In comparison, *high-complex* products include land-based vacations, cruises, and tours which are difficult to assess informationally. Jun et al. (2010) examined tourists' information search strategies in online purchases, focusing on flights and accommodations. Results indicated that individuals use selective information sources and information attributes that differ by product decision. For flight decisions, tourists rely on direct information sources and focus on transaction-oriented information such as prices and availability. Because the heterogeneity of accommodation

products increases decision-making uncertainty, tourists gather information from various sources including direct accommodation websites, official destination websites, and review websites. Moreover, travellers focus on mixed sets of transactional, informational, and branding attributes.

Scholars have demonstrated that various information sources, coupled with tourists' information processing strategies, are influenced by the timing of search activity. Van Raaij and Francken (1984) noticed greater use of non-personal information sources in the early stages of travel planning, likely so tourists could understand the attributes and availability of destination alternatives. In later stages of planning, personal information sources were more often used when evaluating alternatives. Fodness and Murray (1998) indicated that a mixture of marketing and personal information sources were common in ongoing information searches but not during pre-trip planning.

Relevant studies have focused mostly on tourists' pre-trip information search behaviour; few have examined such after tourists' arrival in a destination. Hyde (2008) noted that travel information fulfils various functions and influences tourists' decision making differently throughout the trip process. Upon arriving in a destination, tourists are eager to acquire information to plan a vacation itinerary and consolidate pre-trip plans. They often consult numerous information sources in the destination, both personal and impersonal, which can influence their length of stay and chosen attractions and activities (Udd, Hulac, & Blazey, 1992).

Rompf, Dipietro, and Ricci (2005) proposed a model depicting tourist purchase behaviour mediated by contextual factors of at-destination decisions. For on-site decision timing, tourists often requested recommendations from locals who were deemed knowledgeable and trustworthy. Such 'third-party referrals' were considered highly relevant in mediating information search

activities that may affect purchase decisions. Environmental influences and individual characteristics were modelled as moderators of need recognition, informational search activities, and alternative evaluations during decision making. At-destination situational factors including time constraints, lack of interest, perceived risk, and limited expertise could also shape tourists' information search behaviour. Nishimura, Waryszak, and King (2006) pointed out that recommendations from family and friends comprised tourists' main information sources prior to departure. Tour guides, local residents, and word-of-mouth from other tourists exerted stronger influences on decisions made during the trip. DiPietro et al. (2007) stated that tourists use multiple sources to gather information about travel-related services at destinations. Friends, relatives, and hotel staff are the most important sources when making service-venue decisions. The relative importance of information sources also varies by service. For example, hotel staff constitute the second most common information source for decision making on all types of services except transportation, which is more influenced by car rental service personnel.

Van Middelkoop, Borgers, and Timmermans (2003) suggested that tourists are bound by the limits of rationality in working memory and their capacity to process available information; hence, travellers tend to apply simple rules or heuristics to make decisions rather than evaluating all possible alternatives. Chosen information sources, product evaluations, and choice strategies when making purchase decisions reflect relationships between environmental and social contexts in decision outcomes.

A review of research on tourism information processing reveals that this stream has focused on information sources and channels, information search behaviour, and processing strategies during trip planning (Fodness & Murray, 1997; Jacobsen & Munar, 2012; Vogt & Fesenmaier, 1998; Zins, 2007). However, limited systematic efforts have sought to understand tourists' on-site

information search and processing behaviours for travel-related purposes (DiPietro et al., 2007; Rompf et al., 2005). As noted earlier, many tourists tend not to make important travel decisions or detailed plans early in a trip due to uncertainty around travelling and the destination. They often postpone some decisions until on site and use local information to guide their choices (Bettman et al., 1998; Decrop & Snelders, 2005; Hwang & Fesenmaier, 2004; Jeng & Fesenmaier, 2002). Furthermore, unexpected circumstances often require tourists to modify their original plans, resulting in further information search and processing activities during the trip. Therefore, tourists' information acquisition and processing for decision making can occur at any time in a journey (i.e., pre-departure until departure, in transit, and upon arrival) (DiPietro et al., 2007). Leisure travellers refer to various combinations of information sources continuously rather than relying exclusively on pre-trip information searches (Fodness & Murray, 1998). Thus, researchers need to examine the changing structure and importance of information sources throughout different trip phases. In particular, little is known about what happens when tourists explore the complex information space of a destination. Areas of interest include how spontaneous needs emerge and how information cues, information sources, and social input contribute to tourists' decision making. Studies have identified myriad factors that mediate complex and interrelated information search and processing behaviours. Such features include task characteristics (e.g., perceived risk, types of tourism services, the significance of the task, and decision-task complexity); individual characteristics (e.g., type of tourist, personal traits, and affect); situational involvement; and environmental factors (e.g., cultural and situational forces) (DiPietro et al., 2007; Fodness & Murray, 1998; Money & Crotts, 2003). It would be valuable to investigate the extent to which contextual factors explain information search and processing behaviours around various tourism products (e.g.,

attractions/places, routes/transportation, restaurants/dining, purchases/shopping) throughout the tourism decision-making process (Jun et al., 2010).

2.3 Mobile Technology and Tourism

The proliferation of smartphone and social platforms has amplified mobile information technologies' supporting role in tourism activities, information exchange and dissemination, and fulfilment of situational needs (Neuhofer, Buhalis, & Ladkin, 2015). Mobile technology is now embedded in many aspects of travel. Tourist behaviour is likewise becoming increasingly dynamic and socially connected, particularly thanks to cutting-edge mobile services. The topic of mobile technology in tourism has attracted much attention from tourism scholars. Relevant literature has focused primarily on smartphone usage during travel and its diverse impacts on the tourist experience (Dickinson et al., 2014; Wang et al., 2012; Wang et al., 2014; Wang et al, 2016; Tussyadiah, 2016). Numerous benefits of smartphones have been identified, including extending communication, enhancing information gathering and sharing, and permitting co-constructed and augmented experiences (Wang et al., 2011). These studies have expanded knowledge on the roles and effects of smartphones in tourism (Dickinson et al., 2014; Wang et al., 2012; Wang et al., 2014; Tussyadiah, 2016) along with the adoption and usage of smartphones while travelling (Wang et al, 2016).

2.3.1 The Usage and Impact of Mobile Technology in Travel

The information era, characterised by far-reaching access to mobile technology, has transformed how people access information. With unique attributes and associated applications, the emergence of mobile technology has added new value for tourists. The mobility, convenience, and usability of mobile technology enable tourists to quickly access information and tourism-

related services. Travellers can also implement transactions via wireless networks anytime and anywhere. Localisation and personalisation characteristics provide reliable and up-to-date information along with innovative services to on-location and on-demand tourists (Alqatan, Singh, & Ahmad, 2011).

Many scholars have been inspired by the ubiquity of smartphones in travel and tourism. Wang et al. (2012) reported that tourists often use smartphones for four types of activities: travel planning, general facilitation (e.g., navigation), advanced facilitation (e.g., destination guidance), and travel experience sharing. Smartphones play a significant role in three travel stages, namely pre-trip (anticipatory), on-site (experiential), and post-trip (reflection) (Wang et al., 2012). Wang et al. (2014) and Wang et al. (2016) demonstrated that tourists use smartphones during trip stages for various travel-related purposes including information gathering, connection, navigation, on-site transactions, communication, and entertainment. Lamsfus et al. (2015) argued that the growth of mobile technology has altered how people use the Internet for travel-related purposes. Researchers have also suggested that the use of smartphones during travel is framed by tourists' everyday use of these devices (e.g., in terms of routines, habits, obligations, and skills) (Lamsfus et al., 2013; Wang et al., 2014; Wang et al, 2016). Smartphone use often causes social relationships, leisure and work-related activities, and social norms to spill over into trips (Kirillova & Wang, 2016).

Research has also indicated the influence of mobile technology on tourists' experiences. In the tourism literature, escaping from the mundaneness of everyday life is a basic motivation behind leisure tourism; thus, being separated from daily duties is key to a satisfactory tourism experience. Yet smartphones enable continuous communication while on the move, creating a sense of 'co-presence' due to shifting proximity (Moores, 2004). Such constant connectivity greatly influences

on people's perceptions of place, distance, sociality, authenticity, and other 'senses of tourism', leading to de-differentiation of tourism and everyday life (Jansson, 2007). The sense of travel has thus been transformed by smartphones and their associated apps (Dickinson et al., 2014; Lamsfus et al., 2013; Wang et al., 2014). Ongoing communication with temporarily distant social circles blurs the experiential division between being at home and going away, resulting in 'decapsulation' of the tourist experience (Jansson, 2007). Several researchers have pointed out that a new tourist experience has been constructed through smartphones (Dickinson et al., 2014; Lamsfus et al., 2013; Wang et al., 2014). The adoption of various mobile technologies can potentially alter associations between tourists' objectives, places, and information (Dickinson et al., 2014; Lamsfus et al., 2013). Wang et al. (2014) noted that mobile technology facilitates a creative tourist experience by shifting travel contexts in terms of travel stage, the composition of the travel party, and trip type.

Studies on the use of smartphones and accompanying applications during travel have illustrated that smartphones have transformed the chronology of tourism experiences. These devices provide ubiquitous access to information, navigation, social networking, and entertainment (Mascheroni, 2007; Wang et al., 2014; White & White, 2007; Tussyadiah, 2016). Accordingly, smartphones greatly influence tourists' on-site behaviours. According to Schwanen and Kwan (2008), ICTs such as smartphones and the mobile Internet increase the spatial and temporal flexibility of everyday travel and activities. Increased geographical mobility fuelled by mobile technology may also shape tourists' travel behaviour.

Smartphones offer the most convenient and efficient solution for coping with unexpected situations. These devices also allow tourists to coordinate travel activities more effectively (Wang et al., 2014). Therefore, tourists often postpone decisions until arriving in a destination, resulting in numerous needs emerging spontaneously. On-the-go tourists tend to make decisions on the basis

of social interaction, technology, and environmental factors; hence, their decision making is increasingly dynamic and socially connected (Lamsfus et al., 2015). Research has demonstrated that smartphone use during travel can lead to impulsive activities and changes in tourists' decision-making schema (Kah & Lee, 2014; Wang et al., 2012). The interaction between decision makers and mobile technology has also altered the context of travel, especially the decision-making environment, which can affect numerous aspects of tourists' decision making. Decision-making flexibility (i.e., rigid vs. flexible), decision specificity (i.e., micro vs. macro), the decision-making time frame (i.e., instantaneous vs. long term), and information needs (i.e., functional—creative) can all be influenced by mobile connectivity (Lamsfus et al., 2015). Given the essential role of smartphones in travel, it is important to understand how tourists use smartphones during the decision-making process and the consequences of such usage.

2.3.2 Mobile Technology and Tourists' Decision Making

Information is an essential component of tourism given the nature of leisure travel, independent tourists, and tourists' decision making; hence, ICT likely has substantial effects on tourists' decision making. The high-quality information available online has promoted the popularity of mobile technology for travel planning and decision making (e.g., for destinations, accommodations, attractions, restaurants, and shopping). A survey report stated that nearly 9 out of 10 smartphone users in the United States searched for travel information via the app for an average of 93 minutes per month (Lyu & Hwang, 2015).

Several studies have provided insight into tourists' ICT usage for information searches and decision making. Most work has addressed the underlying characteristics of ICT that drive device adoption and usage in travel. As listed in Table 2.1, authors came to similar conclusions despite

using different methods. For example, innovation attributes such as usefulness and ease of use were deemed indicators of tourists' behavioural intentions to adopt mobile technology. Although various perspectives have provided insight into tourists' usage of mobile technology, findings have been distinct. Social norms or social influence have a significant impact on tourists' behavioural intentions according to Lai (2013), No and Kim (2014), and Wang et al. (2014); however, this result was not supported in Lu, Mao, Wang, and Hu's (2015) study. Lu et al. (2015) attributed this discrepancy to the rural tourism setting of their research, as rural travel apps were a new phenomenon with little social awareness. In a qualitative study by Wang et al. (2014), the results illustrated that smartphone use in travel was driven by several features: individuals' cognitive beliefs and situational factors; extrinsic and intrinsic motivations; previous smartphone use during travel; and daily smartphone use. Tourists' extrinsic and intrinsic motivations appeared to be fundamental forces behind smartphone use during travel.

Table 2. 1 Indicators of Mobile Technology Adoption in Travel

Researcher	**Indicators of Mobile Technology Adoption**
Lai (2013)	Informativeness, entertainment, performance expectancy, effort expectancy, social influence, and facilitating conditions
Trakulmaykee, Baharudin, & Arshad (2013)	Mobile design quality and innovation characteristics (i.e. relative advantage, compatibility, lack of complexibility, trialability, and mobility)
No & Kim (2014)	Hardware: usefulness, social influence, ease of use; Software: satisfaction of travel information
Wang, Xiang, & Fesenmaier (2014)	Extrinsic and intrinsic motivations, cognitive beliefs (i.e. perceived ease of use, usefulness, trust in Internet information sources and subjective norms), situational facilitators, previous use, and everyday usage
Lu, Mao, Wang, & Hu (2015)	Innovation characteristics (i.e. perceived usefulness, ease of use, and compatibility), performance outcomes, and personal outcomes
No & Kim (2015)	Accessibility, Security, Information–trust, Interaction, and Personalisation
Huang, Goo, Nam, & Yoo (2017)	Informativeness, Accessibility, Interactivity, and Personalization

No and Kim (2015) identified five attributes of online tourism information – accessibility, security, information-trust, interaction, and personalisation – as central to travel information searches and decision making. *Accessibility* refers to the extent to which tourists can assess, navigate, and obtain information and/or services. *Security* encompasses a website's safety and privacy in terms of protecting users' personal information. *Information-trust* refers to users' perceived trustworthiness of the information. *Interaction* is the provision of immediate, active communication and real-time feedback. *Personalisation* focuses on information tailored to individual needs. Huang et al. (2017) later explored the use of tourism ICTs relative to travel decision making. Two mechanisms were found to govern the decision-making process: *exploration*, referring to search, experimentation, and discovery of new alternatives; and *exploitation*, referring to refinement, efficiency, implementation, and execution. The findings suggested that the informativeness, accessibility, interactivity, and personalisation of ICT led to its adoption in travel decision making, especially for idea formation and information search. In comparison to traditional information sources such as print newspapers and travel agents, mobile technology enables tourists to explore several alternatives and offers a sense of exploration and pleasure. Although the facets of mobile technology encouraging tourists' use and adoption have been thoroughly studied, precisely how mobile technology is used for on-site travel decision making has not been examined.

Smartphones have the potential to influence tourists' decision-making process. As the amount of information increases, the depth and breadth of intelligent applications have changed; now, mobile technology has substantially enriched available travel information (Ho, Lin, & Chen, 2012). Scholars have shown that mobile devices and associated apps can address multiple decision-making needs (i.e., functional, innovation, hedonic, aesthetic, and social). Such support

extends to travellers' unplanned and situational needs on the go (Wang et al., 2012; Lamsfus et al., 2013). A distinctive characteristic of smartphones is social networking, which allows people to create and exchange information, including travel ideas (No & Kim, 2015). The nature of tourism-related products and services also encourages tourists to review online travel information via mobile networks. Social media or social networking services range from user-generated content sites (e.g., Facebook and Twitter) to media-sharing sites such as YouTube and review sites such as Yelp. All have been widely used by domestic and overseas travellers due to the perceived value in information reliability and enjoyment (Chung & Koo, 2015). Other consumers' comments and personal experiences can shape tourists' attitudes, perceptions, intentions, and ultimate product choices (Gretzel & Yoo, 2008). Considering users' contexts, smartphones can provide personalised recommendations to support travel-related information searches and trip organization. Meehan, Lunney, Curran, and McCaughey (2016) conducted a user study to evaluate a mobile app based on real-world environmental, temporal, and personal contextual data. Findings revealed that multiple contextual factors (e.g., time, weather, social media sentiments, and users' preferences) significantly influenced users' chosen tourist attractions. Mobile recommender systems with multi-contextual design can also provide intelligent recommendations for tourists compared with systems offering either location-based or random recommendations.

Mobile technology maintains an important role in searching for and obtaining travel information and enhances tourists' ability to process decision-related information. Smartphones contain numerous tools, applications, and services for communication, searching, browsing, and information retrieval. Such information can be gathered in various ways, including undirected or conditional viewing and informal or formal searching (Li et al., 2003). In addition, smartphones' visual presentations can facilitate users' exploration, comprehension, and sense-making (Lurie &

Mason, 2007; Peng, 2012), thus promoting information processing and decisions (Benbasat & Dexter, 1986; Jarvenpaa, 1989; Peng, 2012). Moreover, interactive features of mobile technologies help consumers integrate information, consider various forms of information simultaneously, and identify underlying patterns to develop insights (Lurie & Mason, 2007). Yet smartphones also have disadvantages. Pitfalls include small screens with a limited capability to display a full set of items and multiple windows, which may prohibit users from focusing on the screen for a long time (Ho, Lin, Yuan, & Chen, 2016). Thus, smartphone users may experience relatively high efficiency and low cognitive loads when processing information displayed on smartphones. These devices might then influence information channels and quantity, how tourists process such information, but how they make and implement decisions.

Furthermore, Money and Crotts (2003) found that tourists' extent and types of information search behaviour was contingent upon the level of perceived risk. Travellers expressing greater uncertainty avoidance or risk aversion tended to engage in complex information processing, indicating a tendency for rational (as opposed to emotional) and cognitive-based searching. Instant communication with family and friends via smartphones also helps tourists feel more informative or informed, fun and connected. As such, they felt more secure and less stressed, resulting in greater confidence about their trips (Wang et al., 2014; Wang et al.,2016). In this regard, smartphones may affect tourists' information processing by mediating uncertainty or perceived risk. Additionally, the development of e-commerce and new ICTs can encourage impulse purchases due to increased accessibility to product or service information along with the ease of making purchases (Strack et al., 2006). Information processing of impulsive decisions precludes thoughtful, deliberative assessment of available information and alternative choices (Kacen & Lee,

2002). Consumers' feelings and judgments about a product are typically rooted in hedonic, affect-related criteria such as taste and physical attractiveness (Hofmann, Friese, & Strack, 2009).

Today's ubiquitous information environment may also raise concerns about overwhelming amounts of information. Malhotra (1982) found that people cannot make detailed comparisons of alternative options based on all attributes under intensive information conditions; instead, individuals tend to adopt simplifying strategies or heuristics to complete ranking tasks. Lurie (2004) noticed that increased volumes of information lead to fewer acquisitions and more time per acquisition. That is, consumers tend to be more selective in their information acquisition and ignore information perceived as irrelevant to their decision goals (Jun & Holland, 2011); rather, they may spend longer on the most important attribute. Research has also revealed an emergent shift in information processing behaviours toward increased adoption of effortless processing via smartphones (Jun & Vogt, 2013).

Scholars have pointed out that tourists use a combination of online and offline sources to facilitate information acquisition and decision making (Pan & Fesenmaier, 2006; Andereck, 2005; Jun et al., 2007). Accordingly, smartphones can supplement traditional tourism information sources by facilitating travel decision making. Tsang, Chan, and Ho (2011) found that tourists still perceive travel guidebooks as useful. These resources provide tangible, comprehensive information rather than the fragmented information available online. Lyu and Hwang (2015) noted that the development of information technology can adversely affect user demand for tourist information centres. However, heavy social media usage was related to higher demand for tourist information centre visitation. These results imply that tourists tend to consider the quality and trustworthiness of travel information obtained from multiple sources. It is therefore essential to understand how information search activities via mobile Internet interact with tourism information

sources. It is similarly important to examine information seekers' perceptions using micro-level analysis (Ho et al., 2012).

Although a growing body of literature has contributed to the knowledge of smartphones in tourism, most work has included single empirical studies. Conceptual papers driving theory development and critique are rare (Wang et al., 2010). Increasing mediation of tourism decision making via smartphones has only been sporadically discussed in the tourism literature. There is much to be done to uncover the effects of smartphone usage on tourists' decision-making processes. The rapid development of smartphone technology has enabled tourists to adapt their behaviour to take advantage of new channels; however, users' decision-making behaviour has changed in kind. Tourism decision making should thus be considered adaptive behaviour in response to an evolving technological environment (Xiang et al., 2015). No studies appear to have evaluated the effects of smartphones on tourists' information acquisition and processing strategies when making decisions. Elaboration on this topic should include information sources, information search behaviour, information processing strategies, attitude and judgment formation, and choice behaviour. In a mobile technology context, there is fertile ground for research in these areas.

2.4 Summary of the Chapter

According to the nature of the phenomenon under investigation, this chapter frames this study in three streams of literature: 1) leisure tourists and travel behaviour, 2) tourists' decision making, and 3) mobile technology and tourism. The above discussion highlights the major contributions and critical issues relevant to this study.

Research on leisure tourists and travel behaviour has suggested that leisure travel offers individuals a sense of freedom, novelty, self-determination, mastery, and autonomy over the travel

process (Cohen, 1972; Crompton, 1979; Dann, 1981; Mayo & Jarvis, 1981; Iso-Ahola, 1982; Mannell & Iso-Ahola, 1987). Aspects of a trip plan developed before a trip will likely change during the decision-making process as the tourist confronts choice alternatives and/or spatial-temporal constraints (Becken & Wilson, 2007; Hägerstrand, 1970). The experiential nature of leisure travel, the openness of tourists' behaviours, and the contextual influences could lead to affective, intuitive, and spontaneous decision-making behaviours (Morrison, 2010; Holbrook & Hirschman, 1982; Hyde, 2008). Every tourist behaviour takes place in time and space (Huang & Wu, 2012). A spatial-temporal approach can be employed to understand how tourists explore the destination in terms of the participation in activities, the location, and duration, and the movement between them (Hägerstrand, 1970; Grinberger et al., 2014; Huang & Wu, 2012). Since a range of factors could influence tourist intra-destination behaviour or the results of decision making, research is needed to identify the influential factors in determining a particular behaviour in space and time within different contexts.

Scholars have realised that tourism decision making follows a complex, dynamic, evolutionary, and adaptive process including sub-decision bundles that vary in timing and flexibility (Hyde, 2004, 2008; Decrop & Snelders, 2005). Tourists' information search represents an ongoing process that can occur at any point in a journey. Tourists use different information sources and processing strategies during the on-site stage compared to pre-trip information searches (Van Raaij & Francken, 1984; Fodness & Murray, 1998). Moreover, tourists' information search and processing behaviours during the decision-making process vary by travel product type and decision context (DiPietro et al., 2007; Fodness & Murray, 1998; Money & Crotts, 2003). As pointed out in the preceding review, three fundamental problems are associated with conventional models of tourism decision making: rationality, the focus on input-output variables rather than

cognitive processes, and the scope of tourism products or travel stages. These issues constrain knowledge development on tourists' decision making. The investigation of cognitive processes of tourists' decision making in motion through various scenarios may contribute to theory development on these issues.

Previous studies noted that smartphones have been adopted during the three-stage trip process for information, connection, navigation, on-site transactions, communication, and entertainment. The use of smartphones can influence tourism experiences and change travel behaviours (e.g., en-route planning, less prior planning, more flexibility, and more trips) (Wang et al., 2014; Wang et al.,2016). As a result, smartphone use exerts an influence on tourists' decision-making schema (e.g., decision-making flexibility, decision specificity, decision-making time frame, and information needs) (Lamsfus et al., 2014, 2015). As one kind of ICTs, tourists' use of smartphones for travel decision making may originate from attributes of ICT that are identified to influence the general adoption of ICT in travel (Lai, 2013; No & Kim, 2015; Lu et al., 2015; Huang et al., 2017). In addition, the use of smartphones while in motion may be associated with the value-adding features of mobile technology for on-the-go tourists (Anckar & D'incau, 2002). Although research has suggested that smartphones may influence the channels and amount of information collected, how tourists process information, and how tourists make and implement decisions (Li et al., 2003; Lurie & Mason, 2007; Peng, 2012; Benbasat & Dexter, 1986; Jarvenpaa, 1989; Peng, 2012; Lurie & Mason, 2007), there is lack of knowledge of the effects of smartphone usage on tourists' decision-making processes.

In summary, the current studies and models present an extant understanding of tourists' decision making in motion. However, the critical review of the literature demonstrates that much further research is required to provide a more clear, comprehensive understanding of the

phenomenon. In the next chapter, relevant theories to guide the investigation of tourists' decision making in motion are discussed.

CHAPTER 3 THEORETICAL FOUNDATION

This chapter introduces the theoretical foundation for this study, including reviews of theories in three areas: decision making, environmental psychology, and information processing. This study investigates the ground research question: How is tourists' decision making in motion different from existing decision-making studies? First, the chapter reviews six decision-making paradigms to contextualise decision-making theory (Smallman & Moore, 2010). One paradigm, naturalistic decision making (NDM), is applied to examine decision making in motion through real-world scenarios. Second, theories on environmental psychology are introduced. This stream of literature outlines the contextual aspects constituting tourists' decision making in motion. Third, information search behaviour and information processing are important parts of tourists' decision-making process; thus, relevant theories are introduced to illuminate individuals' information processing modes and accompanying strategies or heuristics. Finally, the following section identifies the conceptual gaps arguing that these theories provide an inadequate guide for the investigation of decision making in motion in the travel context. Thus, there is a need for the development of a new conceptual framework from the tourists' rich descriptions of their decision making in motion in real-world settings.

3.1 Decision-Making Theory

3.1.1 Decision-Making Paradigms

Behavioural decision theories have proliferated since the 1950s along with experiments to test them. Various decision-making models have arisen from efforts to identify factors relevant to consumer decision making and the relationships between these factors. 'Variance theories' of decision making fall into six paradigms (Smallman & Moore, 2010): classic prescriptive,

analytical everyday decision making (Edwards, 1954); prospect theory (Kahneman & Tversky, 1979) and regret theory (Loomes & Sugden, 1982); bounded rationality (March & Simon, 1958); contingent or adaptive decision making (Payne, Bettman, & Johnson, 1993); a pragmatic view of decision making as context-dependent and socially and discursively constructed (Edwards & Potter, 1992); and NDM (Zsambok & Klein, 1997) (Table 3.1)

Table 3. 1 Conventional Decision-making Theories (Adapted from Smallman & Moore, 2010)

Paradigms	**Key proposition(s)**
The classical concept of prescriptive, analytical everyday decision making (Edwards, 1954)	People evaluate both the advantages and disadvantages of each possible outcome, ultimately choosing an optimal solution from a set of alternatives based on subjective expected utility.
Prospect theory (Kahneman & Tversky, 1979) and *regret theory* (Loomes & Sugden, 1982)	Tourists are Homo Economicus who try to maximise the utility through minimizing risk with extensive problem solving and advanced planning.
Bounded rationality (March & Simon, 1958)	Limited by time constraints, cognitive capacity, and incomplete information, individuals make decisions that are 'good enough' ('satisfying') rather than optimal.
Contingent or adaptive decision-making (Payne et al, 1993)	Individuals use a variety of problem-solving strategies, depending upon personal traits or characteristics, and problem and social contexts; the choice is based on economic or cognitive biases.
A more pragmatic view of decision-making (Edwards & Potter, 1992).	Intention is a poor behavioural sign; decision making is less cognitively bound, instead, it is context-dependent and socially and discursively constructed context-dependent.
Naturalistic decision-making (Klein, 2008; Orasanu & Connolly, 1993)	This pragmatic, realistic approach deconstructs decision making through detailed analyses of discourse, narrative, and social actions of the decision maker under a temporally evolving situation.

Early decision-making theories are rooted in utility maximisation, which assumes that decision makers behave rationally: they rank possible choices and make decisions to maximise a subjective measure of value or welfare (i.e., utility) (Slovic, 1995). Tourism researchers

exemplified this approach by deeming tourists 'Homo Economicus', who seek to maximum the utility of their actions by minimising risks through extensive problem solving and advance planning (Um & Crompton, 1990; Wahab, 1976). Recognising the limited insight of rational theories, bounded rationality takes a more realistic view and emphasises perception, cognition, and learning in decision making. This theory posits that individuals' rationality in working memory is constrained (e.g., by processing time, cognitive capacity, incomplete information, psycho-social determinants, and the specific environment). Thus, individuals make satisfactory rather than optimal decisions. This paradigm directs researchers to examine the psycho-social processes by which decision problems are presented and information is processed (Slovic, 1995).

In an information processing view, contingent or adaptive decision making sheds light upon natural dynamics in problem solving. Individuals employ problem-solving strategies on the basis of personality characteristics and environmental factors. They then make choices based on cognitive or economical biases (Decrop, 2006). This view has been applied in tourism decision-making research through acknowledgement of social influences and the need for adaptive decision making (Moutinho, 1987). A more pragmatic view of decision making enhances decision-making theory. The pragmatic approach considers decision making less cognitively bound than prior paradigms. In this case, everything—including decision making—is context-dependent and socially and discursively constructed.

Although the first five decision-making paradigms highlight a deliberate and linear cognitive process with strongly deterministic causation, they neglect essential aspects of decision making (Smallman & Moore, 2010). Grand models derived from these paradigms are largely based on an assumption of high rationality; that is, decision makers possess extensive information processing capacities and make trade-offs to select an alternative with maximum value. Decision

outcomes are considered dependent variables, and their statistical variations are explained by independent variables. However, in real life, many decisions do not follow such rigorous cognitive processes. Traditional decision-making research fails to account for decision makers' experience, task complexity, and demands of the naturalistic environment; hence, a paradigm shift has unearthed the sixth paradigm with a more realistic approach: NDM (Cannon-Bowers, Salas, & Pruitt, 1996).

3.1.2 NDM Applied to Tourists' Decision Making in Motion

Instead of studying inexperienced people engaging in artificial, laboratory tasks, NDM researchers consider how knowledgeable people make decisions embedded in dynamic tasks in real-world settings (Zsambok & Klein, 1997; Orasanu & Connolly, 1993). In addition, the NDM community broadens decision-making research from discrete phases involving choice dilemmas to a continuous flow of behaviour toward a set of different goals (Brehmer, 1990). NDM also considers the effects of contextual factors on decision-making behaviour along with adaptive characteristics of decision making. The model emphasises cognitive processes geared toward certain decision situations and the limitations of individuals' cognitive resources and decision-making competence. In so doing, NDM offers explanatory or predictive power in real-world settings (Zsambok & Klein, 1997). Different from input-output orientation models, NDM models are process-oriented; they attempt to describe cognitive processes (i.e., what information decision makers seek, how they interpret it, and which decision rules they adopt) rather than predict final choices (Lipshitz et al., 2001). This pragmatic, realistic approach deconstructs decision making through analyses of a decision maker's discourse, narrative, and social actions within an evolving situation (Gore, Banks, Millward, & Kyriakidou, 2006; Orasanu & Connolly, 1993). The processes and decision strategies or rules underlying NDM are unique: decision makers evaluate situations

and develop situational awareness through feedback rather than comparing one set of options to another.

NDM focuses on five elements: proficient decision makers, process orientation, situation-action matching decision rules, context-bound informal modelling, and empirically based prescription (Lipshitz et al., 2001). Under NDM, decision makers are proficient. They rely on prior knowledge, which enables most of them to handle challenging decision points with reasonable success (Klein, 2008). Several characteristics define the context in which real-world decisions occur. The first considers dynamic, uncertain, and fast-paced environments featuring ambiguous, temporal information (Orasanu & Connolly, 1993). The second characteristic (ill-structured problems) indicates that decision makers cannot necessarily rely on a single, well-defined procedure to make decisions, as decision tasks have various degrees of structure. The third characteristic involves multiple, shifting goals that are often incomplete, incompatible, or in competition and change over time. The fourth characteristic (multiple action-feedback loops) captures temporally dependent, ongoing decisions with iterative outcomes. These outcomes affect subsequent decisions that become part of the decision problem itself. The fifth characteristic is time pressure and its impact on decision making; this high-stakes characteristic refers to meaningful decision consequences tied to decision makers' internal or external motivations. Other features of NDM include multiple players, information quantity, personal and organisational goal congruence, and individual expertise (Cannon-Bowers, Salas, & Pruitt, 1996). These factors potentially influence the process of decision making.

NDM suggests that proficient decision makers typically employ situation-action matching decision rules involving various matches in place of concurrent choices. Sequential single-option evaluation involves comparing against a standard without comparing options; whether options are

accepted or rejected depends on their congruence with the decision maker's situation or values. The matching process often depends on pattern matching and informal reasoning. Expert knowledge is context-specific; thus, NDM research tends to model decision making in specific domains. This approach delineates the information to which decision makers attend as well as the arguments decision makers use (Smith, 1997). Empirically based prescription applies when decision makers apply content-driven cognitive processes to solve context-specific problems through concrete actions (Lipshitz et al., 2001).

The recognition-primed decision-making model (RPD) is an NDM prototype. RDP seeks to enhance understanding of how experienced decision makers handle time pressure and uncertainty. NDM researchers have noticed that decision makers in natural settings rely heavily on intuition, perceived as the expression and accumulation of experiences (Klein, Calderwood, & Clinton-Cirocco, 2010). People construct patterns that enable them to evaluate situations and make rapid decisions rather than comparing options (Klein et al., 2010). The RPD model posits that decision makers first assess the situation and search for familiar cues. Doing so reveals plausible goals, relevant cues, and appropriate actions, which are then used to generate a course of action. Without comparing advantages and disadvantages across options, the decision maker generates and evaluates one option at a time. Two cognitive processes are highlighted in the RPD model:

- Situation assessment (the decision maker gathers information about the decision problem)
- Mental simulation (mental representation of perceived cues, which facilitates subsequent judgments and decision making)

The recognition/metacognition (R/M) model is a foundational NDM model. The R/M approach describes how people use their experience to generate feasible decisions (instead of using strategies to make rational choices). Such decisions occur under complex conditions of time pressure, ambiguous information, and ill-defined goals. This model emphasises experience and knowledge in evaluating a situation without comparing the strengths and weaknesses of alternative courses of action (Zsambok & Klein, 1997). The judge-adviser system of decision making assumes that decision makers may not always possess specialised knowledge when making decisions. Thus, individuals must rely on input from expert advisers who are committed to promoting ideas that facilitate decisions.

Tourism decision making is high risky due to the experiential and intangible nature of tourism services (Sirakaya & Woodside, 2005). Tourists' decision making in real-world settings often focuses on poorly defined 'problems' driven by multiple or competing goals. These problems tend to involve considerable emotional capital. Diverse decisions occur in dynamic environments where information cues are ubiquitous and often change rapidly. Tourists may possess varying degrees of experience in such problem-solving. Conventional decision-making theories do not encompass the complexity of such processes, thus offering limited insight into tourists' decision making. Some review papers have pointed out the need for greater emphasis on different types of decisions; others have noted the influential roles of constraints, contexts, and heuristics in tourists' decision making (Sirakaya & Woodside 2005; Smallman & Moore, 2010). However, limited progress has been made toward this goal. These features suggest the appropriateness of NDM as a research paradigm to examine decision making in motion. NDM also retains the spontaneity and freedom tourists value. This approach can produce a clearer picture of the fluidity and complexity of tourists' decision-making process.

However, NDM has several inadequacies. First, it mainly focuses on decision-making processes among proficient decision makers (e.g., firefighters, pilots and cockpit crews, and corporate executives). Consumers' decision-making processes have garnered comparatively little attention. Faced with persuasive information, consumers will likely apply different information processing strategies than non-consumers. Second, unplanned/impulsive behaviours and changes to planned behaviours are ubiquitous in tourism due to its dynamic information landscape. The NDM literature has failed to consider that many spontaneous decision characteristics apply while on the move: lack of expertise, loose group structure (high member autonomy), impulsivity, and information processing while moving through an information space. Finally, NDM does not address the increased mediation of information technology (e.g., smartphones) on the decision-making process. This study contributes to NDM research by exploring tourists' decision making in motion and the influence of smartphones on this process. A better understanding of decision-making processes will address these three limitations. Findings will enable policymakers to develop more appropriate policies and help industry practitioners improve tourism marketing.

3.2 Environmental Psychology

A greater appreciation of the role of the environment in individuals' daily behaviour has birthed a growing discipline, environmental psychology. Environmental psychology focuses on relations between humans (action and experience) and the environment. The discipline considers the processes by which individuals interpret, assess, comprehend, cope with, adapt to, and shape their natural and social environments (Giuliani & Scopelliti, 2009; Stokols, 1978). In environmental psychology, the person-in-environment system is considered an inclusive entity that operates in dynamic, ongoing equilibrium (Wapner, 1981). Gradual or rapid changes in

physical, interpersonal, and sociocultural aspects of settings affect the person-in-environment system in various ways (e.g., the organism, environment, transactions, means, and ends).

Environmental psychology is useful for building a theoretical understanding of the complexity of human behaviour and experience. The discipline also carries important implications for tourism research; indeed, "a complex interrelationship between the social situation, the physical environment, and human behaviour makes up the core of travel, vacation planning, and tourism" (Fridgen, 1984, p. 20).

3.2.1 Environment, Context, and Behaviour

As a starting point, the concepts of 'environment', 'behaviour setting', 'situation', and 'context' must be distinguished. According to Clitheroe, Stokols, and Zmuidzinas (1998), the 'environment' refers to the milieu enveloping an individual's or group's behaviours with relatively stable qualities. The 'behaviour setting' is a subset of the environment, referring to well-structured, uniform person-environment transactions that routinely transpire in certain places. The 'situation' is a sub-unit of the behaviour setting; it occurs at a particular location for a specific period (Belk, 1975). The 'context' is the specific interdependence between a set of personal, physical, and social-cultural aspects of environments, behaviour settings, and/or situations, as well as the relationships among them (Clitheroe et al., 1998).

The notion of human-environment optimisation guides environmental psychology. Such optimisation compels people to optimise their relationships under various environmental conditions via a cyclical, dynamic process. People are often limited by environmental constraints or undesirable situational conditions; therefore, they operate on the environment. Individuals attempt to maximise the realisation of short- and long-term goals to maintain a desirable level of

satisfaction (Stokols, 1978). Tourists' behaviours can thus be regarded as outcomes. These outcomes are actively structured and transacted with the environment in an effort to achieve optimisation.

Stokols (1978) proposed two basic dimensions of the human–environment transaction process: cognitive (or symbolic) vs. behavioural (or physical) transactions; and active vs. reactive transaction phases. These dimensions yield the following modes of human–environment transaction:

- Interpretive (active-cognitive) — Cognitive representations of a place (e.g., beliefs, attitudes, perceptions).
- Evaluative (reactive-cognitive) — People's internal (cognitive/affective) attitudes, assessment, and representations of environmental quality, preferences, and satisfaction.
- Operative (active-behavioural) — Human spatial behaviour and its impact on the physical environment.
- Responsive (reactive-behavioural) — The impacts of social and physical components (e.g., objects, rules, peers) of the environment on human performance, behaviour, and wellbeing.

These modes of human–environment transaction can be used as a basis for studying some areas of environmental psychology. The researcher also noted that these modes are not necessarily mutually exclusive; more than one transactional mode could be encompassed in a single study.

Kotler (1973) suggested that atmospherics (i.e., a consumer's perceived set of physical surroundings) play at least three roles in consumption behaviour. Atmospherics comprise an

attention-creating, message-creating, and affect-creating medium to transform behavioural intentions into actual behaviour. In this regard, tourists may explore a destination while experiencing desires and intentions that do not materialise until situational stimuli or cues (i.e., atmospherics) promote consumption. Therefore, tourists' interaction with a destination environment is essential to understanding their decision making in motion. Relevant factors include tourists' knowledge acquisition of the destination, interactions with others, and behaviours on the way (Gifford, 2007).

The effect of environment on behaviours is particularly relevant to service businesses since the service is produced and consumed simultaneously and the consumer is in the factor (Bitner, 1992). Much research in the service industry has adopted environmental psychology theories, predominantly based on the Stimulus-Organism-Response (S-O-R) paradigm (Mehrabian & Russell, 1974), to examine the effects on environmental factors on consumers' affective and behavioural consequences. Studies have shown that the situated environment provides stimulating cues that trigger an individual's internal state and evaluation. This cuing process inspires behavioural responses to stimuli. Such responses include time spent in a shop, merchandise image, incremental spending, purchase choices, satisfaction, and retention (Mehrabian & Russell, 1974). However, environmental psychology has received little attention in the studies of tourism decision making. This lack of research is surprising given the large number of studies that highlight the constructive nature of preferences and choice processes (Bettman et al., 1998; Bettman & Park, 1980a). The necessity of considering the dynamics of decision-making contexts in any decision making study is also supported by Flyvbjerg (2001) who argued that "the context for an event studied by a researcher thus determines whether the event should at all count as a relevant event for study" (p. 42).

3.2.2 Conceptualising the Context of Tourists' Decision Making in Motion

Identifying features and influential factors of the context, collectively named the effective context of the target phenomenon (Stokols, 1987), is crucial when examining tourists' decision making in motion. Dramatic developments in technology and information structures have spurred the need for a comprehensive, systematic conceptualisation of real-world contexts (Clitheroe et al., 1998).

Environmental psychologists consider the dimensions, description, or properties of the context within which behaviour processes occur (Proshansky & O'Hanlon, 1977). Relations between contextual stimuli and individual responses can be examined based on multiple factors: an individual's level of awareness and adaptation; and his/her selectiveness of attention on a few contextual attributes, commonly termed 'cues' (Gifford, Steg, & Reser, 2011). Although scholars have investigated and modelled the aspects of contexts that affect people's behaviour, consistent findings remain elusive.

Belk (1975) identified five groups of variables characterising a situation: physical surroundings (e.g., geographical location, decor, and weather); social surroundings (e.g., other players, their characteristics, their roles, and interpersonal interactions); temporal features (e.g., time of day, season of year, time since last purchase, and time since or until meals); task definition (i.e., one's intention or requirement to choose, shop for, or acquire information about a general or specific item); and antecedent states (i.e., momentary moods such as anger, anxiety, and excitement or momentary conditions such as fatigue and illness).

Mehrabian and Russell (1974) examined stimulus factors and proposed the concept of information rate or load to characterise contexts. A context's load or information rate is defined

by novelty and complexity. *Novelty* refers to unexpected, surprising, and unfamiliar aspects. *Complexity* relates to the number of elements and the extent of motion or change in a context. Context load is further mediated by individual differences in responding to incoming stimuli.

Clitheroe et al. (1998) conducted a theoretical analysis emphasising features of socio-physical-temporal settings that influence individual or group behaviour. Their model illustrates that one or more 'prompts' can initiate psychological and/or behavioural processes: social, physical components of the context; context participants; or an array of extra-contextual sources (e.g., the Internet or popular media) (Figure 3.1). Such processes involve interactions between personal, social, and physical features relevant to a specific context that can be unintentionally directed by vague goals or intentionally guided by explicit objectives and timelines. Furthermore, this model defines three properties of behavioural outcomes: final or intermediate outcomes, intended or unintended outcomes, and reciprocal outcomes. *Intermediate* outcomes occur before individuals have responded to contextual prompts. *Final* outcomes are related to the original prompts and individuals' purposes. *Intended* outcomes refer to behaviour that represents individuals' intentional responses to prompts. *Unintended* outcomes are unintentionally related to prompts. *Reciprocal* outcomes affect the current context. This model unveils contextual features that potentially affect people's behaviours; however, it provides little information about personal, social, and physical aspects of context relative to behaviour, particularly decision making.

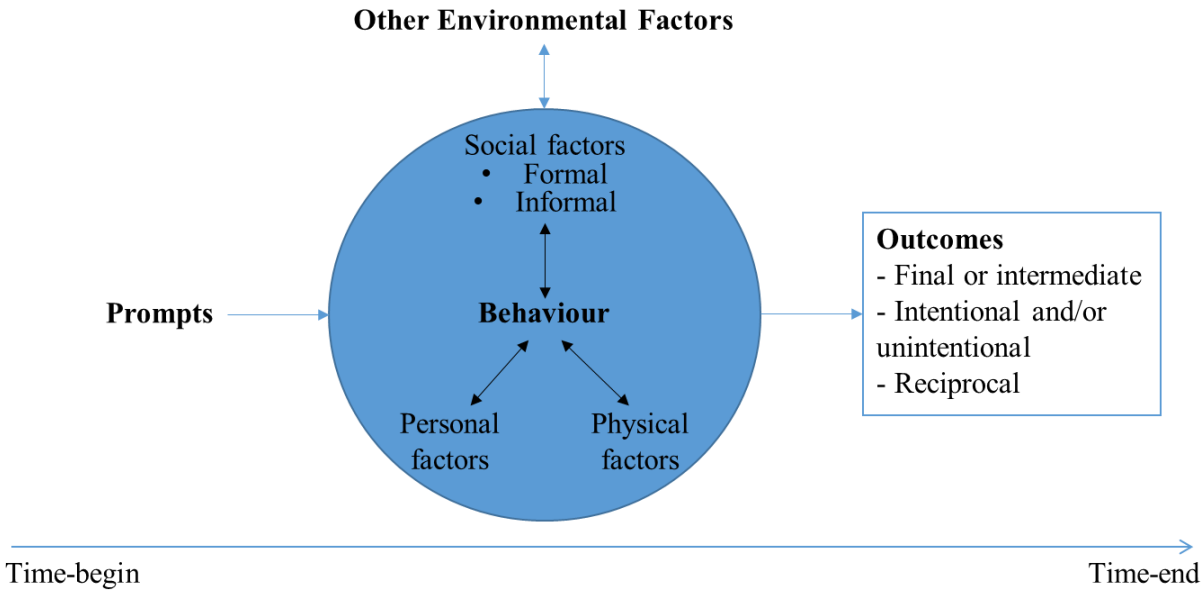


Figure 3. 1 A model of Context (Clitheroe et al., 1998)

To investigate the role of context in human behaviour and functioning, Wapner and Demick (2002) examined the notion of context from a holistic, developmental, systems-oriented perspective. They proposed six general contexts for studying contextual behaviours: physical/biological (e.g., health conditions); psychological/intrapersonal (e.g., self-esteem or anxiety); sociocultural (e.g., family roles); physical (e.g., natural vs. built); interpersonal (e.g., friend, spouse, and crowding); and sociocultural (e.g., laws and regulations; rules of home and culture). The first three contexts are related to the individual; the latter three are related to the environment.

Building on the S-O-R paradigm, Bitner (1992) provided a framework that describes the role of the physical environment in service settings (i.e. servicescapes). The framework proposed a variety of environment factors that lead to cognitive, emotional, and physiological responses,

and in turn, influence the behaviours of individuals in the servicescape. These factors are classified into three composite dimensions: 1) ambiance condition (e.g. temperature, music, odor), 2) space/function (e.g. equipment, furnishing), and 3) sign, symbols, and artifacts (e.g. style of décor). Bitner's (1992) framework provides the most widely adopted typologies of the service environment that can influence the internal responses and resulting behaviors. The orginal servicescapes framework focuses on the built, physical aspects of the environment as opposed to the natural or social environment; however, it overlooks other aspects that may be prominent and should be regarded as part of the service environment. Variations of the servicescapes framework emerge. Tombs and McColl-Kennedy (2003) introduced a conceptual framework of 'social servicescape' to account for social aspects of the servicescape. This framework proposes that the purchase occasion (context) can influence the reaction to the social density and the displayed emotions of other consumers in the service setting, in turn affecting the consumer's affective responses (e.g. moods and emotions) and cognitive responses (behavioural intention or actual behaviour).

Based on a review of 60 empirical studies, Turley and Milliman (2000) classified a wide range of environmental stimuli or element, which affect consumers' evaluations and behaviours, into five groups: the exterior of the store (e.g. size of a building, display windows, sign), and the general interior (e.g. lighting, scents, sounds, cleanliness), the layout and design (e.g. space design and allocation, traffic flow, waiting area), the point-of-purchase and decoration (e.g. product displays, price displays, signs, and cards), and human variables (e.g. employee characteristics, customer characteristics, crowding). Although research has started to examine the effect of more than one environmental cue on consumer behaviour, previous research often focused on retail

environmental characteristics, while other service settings should also be investigated (Mari & Poggesi, 2013).

In summary, environmental psychology offers valuable insights into tourists' decision-making contexts as well as tourists' relations and interactions with those contexts. The examination of environmental psychology theories and models results in a reservoir of contextual aspects or dimensions of tourists' decision making in motion. Previous research generally suggests that contextual influences on individuals' behaviours follow from physical (e.g., geographical location, decor, weather), social (e.g., other players, interpersonal interactions), and individual (e.g. mood, personality, health conditions) aspects of the context. However, previous studies are mostly conceptual and mainly focus on retail settings. An appropriate taxonomy of stimuli variations in travel and tourism settings has been largely untouched. Thus, previous studies and models are inadequate to be directly applied to study the context of tourists' decision making in motion. This study attempts to develop a comprehensive, systematic conceptualisation of contemporary travel context based on empirical data. The context can serve as a foundation to examine tourists' decision making in motion.

3.3 Information Processing Theory

Tourists are bombarded with the information presented in various ways from multiple stakeholders. Marketers provide direct information through advertisements, product packaging, and in-store displays. Tourists also receive indirect information via product price and store type. They must also grapple with social feedback from friends and relatives, salespeople, and other consumers. Public policymakers offer information that may influence tourists' choices as well. It is therefore critical to explore tourists' reactions to information. Relevant considerations include

how information is interpreted and processed and how a piece of information is combined or integrated with other information; these characteristics can guide tourists' decision-making process. Information processing theory has elucidated consumer decision making by identifying the main stages and psychological mechanisms underlying each stage. The information processing theory is reviewed in this section. The following overview provides a basis for understanding tourists' information processing during decision making in motion.

3.3.1 The Mechanisms Underlying the Process of Information Processing

Information processing theory deals with the sequence and execution of cognitive events by modelling human cognition as information processing. This approach assumes that environmental information is subject to mental processes through cognitive systems. These processes can follow several paths depending on individual attention, encoding, recognition, and storage. Information processing uses a computer metaphor (i.e., inputs and outputs) to clarify how information is processed and stored in the human mind (Simon, 1979). This theory focuses on real-time responses to stimuli and how the mind transforms that information. Essentially, the theory examines the processes by which individuals attend to environmental information, encode information to be learned and relate it to knowledge in memory, store new knowledge in memory, and retrieve it as needed.

In information processing theory, individuals are depicted as active seekers and processors of information. This approach focuses on memory (information storage and retrieval), typically reflected by Atkinson and Shiffrin (1968)'s stage theory (Figure 3.2). Stage theory consists of three basic components or memory stages—sensory memory; short-term memory (STM); and long-term memory (LTM)—along with processes assumed to be responsible for transferring information

from one stage to the next (Huitt, 2003). Information associated with the senses (e.g., vision and hearing) first enters sensory memory, where it resides until the information is processed further. STM storage functions as temporary working memory, whereby selected inputs are stored and processed to be prepared for long-term storage or a response. In contrast to the limited capacity of independent information storage in STM, LTM can retain unlimited information. Therefore, LTM greatly influences people's perceptions. In other words, prior knowledge affects how people interpret sensory information. Moreover, this process does not always occur in a unidirectional manner as implied by the model. Mental representation forms are determined by the information itself (data-driven, bottom-up processing) and prior knowledge (conceptually driven, top-down processing).

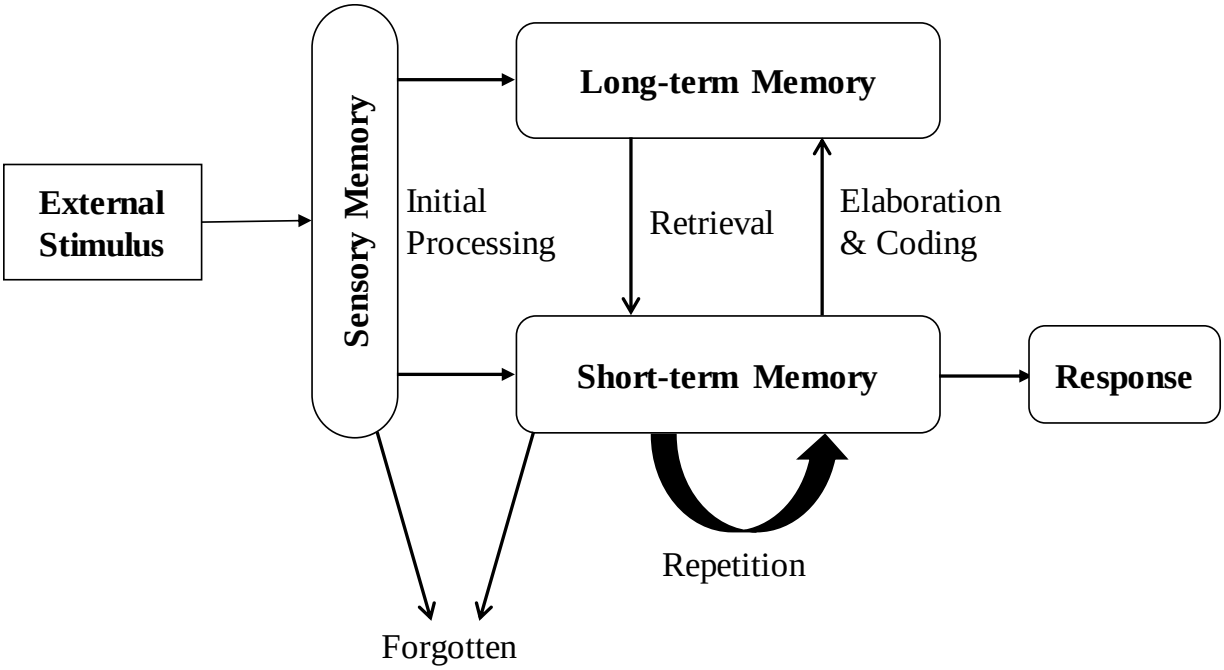


Figure 3. 2 How Information Flows According to Cognitive Information Processing Theory (Huitt, 2003)

Craik and Lockhart (1972)'s levels-of-processing theory suggests that individuals apply different extents of processing (i.e., elaboration) on a continuum ranging from perception, attention, labelling, and ultimately meaning. All stimuli are permanently stored in memory. Different levels of elaboration contribute to one's ability to access or retrieve that memory. Under the parallel-distributed processing model, information is processed simultaneously by several parts of the memory system. In stage theory and levels-of-processing theory, information is processed sequentially. Studies on how emotional data are processed have provided support for parallel-distributed processing. The connectionistic model, which is popular in cognitive psychology, substantiates this position (McClelland, 1988). The model indicates that information is stored in multiple locations throughout the memory system through connection networks. Consistent with the levels-of-processing theory, the connectionistic model implies that a single concept or idea with more connections is better remembered.

The human brain is routinely compared to computers in cognitive information processing theory. Incoming information is encoded and combined with stored information. Working memory is enacted when working on a task, akin to a computer's CPU. Later, information is stored to be retrieved when needed, just as a computer saves information on a hard drive. Several common principles characterise information processing models. Such models are based on the limited processing capacity of the cognitive system; that is, the amount of information that can be processed is limited at specific points. Additionally, the processing capacity of the mental system is not entirely available. A control mechanism overseeing the encoding, transformation, processing, storage, retrieval, and utilisation of information occupies some of this capacity. When an individual is confronted with a new task or environment, this control mechanism requires more processing power than for routine tasks or familiar environments. A third principle involves the

two-way flow of information, namely sensory information and information stored in memory. Furthermore, information processing theory views memory and knowledge formation as interdependent rather than separate processes. The impacts of social factors are considered as well. As individuals develop and accumulate knowledge, their processing abilities change: they can more readily access information from long-term storage, utilise it appropriately, gather and process information more quickly, and move beyond pure recall of stored information. Presumably, individuals learn how to process external stimuli as individuals develop and interact with the external environment (Shaki & Gevers, 2011).

3.3.2 Dual-system Accounts of Information Processing and Decision Making

Among other models, the dual-system theory has enriched understanding of consumers' information judgment and information processing. The theory proposes two parallel interacting systems of organising and processing information. One system (System 1) is slow, deliberate, effortful, systematic, and analytic; it uses argument-based evaluations (e.g., the content and strength of an argument), which requires conscious recollection and interpretation when processing new information (Scholten, van Knippenberg, Nijstad, & De Dreu, 2007). The other system (System 2) is fast, preconscious, associative, effortless, and holistic; it involves affective and intuitive responses (i.e., positive/negative feelings) to new information and uses general, stable, and stored-in-memory representations formed over emotionally significant past experiences (Dhar & Gorlin, 2013; Jun & Vogt, 2013; Smith & Decoster, 2000). Evans (2008) classified the features of Systems 1 and 2 into four clusters: consciousness, evolution, functional characteristics, and individual differences (Table 3.2). System 1 can connect symbolic representations flexibly via relations and extract new meanings from applying those relations. Such representations are responsible for generating explicit, propositional judgments and decisions and for correcting

judgments. In contrast, System 2's automatic and fast information processing is activated along with associative contexual links. These links depend on cues, including emotions related to persuasion messages, the attractiveness or perceived credibility of a message source, and advertising design and aesthetics (Samson & Voyer, 2012). Everyday behaviours are jointly governed by these systems, directed by distinct operating principles (Shiloh, Salton, & Sharabi, 2002).

Table 3. 2 Clusters of features associated with dual systems (Evans, 2008)

System 1	**System 2**
Cluster 1 (Consciousness)	
Conscious	Unconscious (preconscious)
Explicit	Implicit
Controlled	Automatic
High effort	Low effort
Slow	Rapid
Low capacity	High capacity
Inhibitory	Default process
Analytic, reflective	Holistic, perceptual
Cluster 2 (Evolution)	
Evolutionarily recent	Evolutionarily old
Individual rationality	Evolutionary rationality
Uniquely human	Shared with animals
Linked to language	Nonverbal
Fluid intelligence	Modular cognition
Cluster 3 (Functional characteristics)	
Rule-based	Associative
Domain-general	Domain-specific
Abstract	Contextualized
Logical	Pragmatic
Sequential	Parallel
Egalitarian	Stereotypical
Cluster 4 (Individual Differences)	
Heritable	Universal
Linked to general intelligence	Independent of general intelligence
Limited by working memory capacity	Independent of working memory

From a dual-system perspective, consumers may evaluate alternative options based on existing knowledge, expertise in memory, or affect (System 2). They can also process choice-related information by weighing costs and benefits (System 1) during decision-making processes (Samson & Voyer, 2012). The two systems can operate concurrently. System 2 processing is more likely to be anchored at the upper end of an information-seeking/analysis/integration continuum, whereas System 1 processing might occur at the lower end of the continuum.

In terms of the interaction between Systems 1 and 2, dual-system models hold different perspectives. The elaboration likelihood model (ELM) maintains a strict System 1–System 2 distinction. The heuristic-systematic model (HSM), reflective-impulsive model (RIM), and experiential vs. analytic model (EAM) focus on the parallel-competitive dual nature of consumer behaviours. These two processes can interact and generate conflict between 'knowing' and 'feeling', which may influence decision outcomes. RIM represents a typical parallel-competitive duality structure: impulsive and reflective processes mostly operate in parallel and jointly but may compete when incompatible schemata are activated. Moreover, the two systems can influence and intervene with each other. System 1 may impair System 2's ability to control attention and impulse via the priming process or basic needs deprivation (e.g., cravings, hunger, or thirst) (Strack et al., 2006). System 2 may affect System 1 through the intending process. System 2 can also affect System 1 by regulating perceptual input or cognition (e.g., distractions from tempting stimuli) or considering a behaviour or its outcome. All duality models apart from ELM involve interaction between Systems 1 and 2, where System 2 processes 'correct' those of System 1 (Samson & Voyer, 2012). Yet the relationship between these systems, particularly in their order and simultaneity, remains debatable (Evans, 2008).

The likelihood of processing given information, and its contribution to human judgment, is a function of the ease/difficulty of processing given individuals' available resources. Chun and Kruglanski (2006) found that limited processing resources (cognitive load) favor early and/or brief (i.e., easily processed) information. Such emphasis may compromise the thoroughness of processing subsequent and/or more complex (i.e., difficult-to-process) information, which can affect the use of such information for judgment. By contrast, ample processing resources allow for thorough information processing. In the RIM model, activation of the reflective system is moderated by cognitive capacity (i.e., accessibility to cognitive processing resources) (Sherman, Gawronski, & Trope, 2014). The accessibility of information relevant to behavioural options may also influence reflective processing (Strack et al., 2006). The impulsive system becomes more influential when cognitive resources are limited (Samson & Voyer, 2012).

The distinction between the processes of Systems 1 and 2 pertains to the availability of processing resources. Accordingly, information processing modes vary by situational factors and individual differences. Given limited cognitive resources, decision makers tend to rely on affect or easily retrievable/assessable mental content. They may also use fewer cues and integrate less information (System 2) to process information more effectively. With sufficient cognitive resources, however, individuals can engage in deep analytic and systematic information processing and are less influenced by heuristic cues (System 1). Research has indicated that the intuitive or experiential mode is generally adopted in situations characterised by high uncertainty, time constraints, limited experience, lack of domain-specific expertise, multiple alternatives, and interpersonal interaction (Kutschera, 2002).

One's level of involvement in a purchase situation has been used to explain individual differences in information processing. These situations are shaped by interactions between

individual, product, and situational characteristics (Sirakaya, & Woodside, 2005). As System 1 demands relatively high cognitive effort and capacity, the decision maker must be motivated to engage in in-depth information processing. In comparison, System 2 requires relatively little cognitive effort and capacity, thus entailing minimal information input. ELM and HSM suggest that given low involvement/interest and/or insufficient cognitive resources, individuals will likely engage in peripheral or heuristic processing en route to a judgment. Given high involvement/interest and/or ample cognitive resources, individuals engage in central or systematic processing. Prior experience could reduce one's information search and perceived risk while enhancing confidence in a choice, which will likely be associated with low involvement. Jun and Vogt (2013) examined information processing strategies in the travel decision-making process using a dual-system model. They found that individuals follow an effortless processing mode rather than an effortful mode in low-involvement situations.

Furthermore, information processing is influenced by feelings: positive and negative affect, cognition, or senses of hunger and thirst. A positive mood is more likely to induce System 1 processing. A negative mood facilitates System 2 processing. Schwarz (2002) contended that one's mood provides affective cues characterising the benign or problematic nature of a situation. Being in a negative mood signals a challenging situation, which fosters statistics-driven, systematic processing requiring detailed analysis. This type of situation also discourages simple, heuristic strategies that fail to consider contextual specifics. Conversely, a happy mood signals a benign situation. A good mood thus facilitates heuristic, flexible processing rooted in routine and pre-existing knowledge structures (Schwarz, 2002). Therefore, individuals' cognitive processes are adaptive to situational needs signaled by feelings or mood states.

Table 3. 3 Comparison of Duality Models in Persuasion & Attitude Change, Judgment & Decision Making and Buying & Consumption Behaviour (Samson & Voyer, 2012, p. 61)

	Persuasion and Attitude Change	**Judgment and Decision Making**	**Buying and Consumption Behavior**
Model [Structure]	Elaboration Likelihood (ELM) [N/A]	Intuitive vs. Reflective [Default-Interventionist]	Reflective-Impulsive (RIM) [Parallel-Competitive]
	Heuristic vs. Systematic (HSM) [Parallel-Competitive]	Experiential vs. Analytic [Parallel-Competitive]	Hot/Cool [Default-Interventionist]
Process			
Inputs	Information and cues (acquired from brand initiated communication, other customers or expert sources)	Information and cues (e.g., product features)	Information and internal (imagination) or external (perception) consumption stimuli or cues
Process/ System 1	Logical evaluation of evidence; computation and comparison (e.g., scrutiny of message content, quality of arguments, accuracy of comparison process)	Logical evaluation of evidence; computation and comparison (e.g., weighing of costs and benefits)	Logical evaluation of evidence; computation, comparison, planning and choice (e.g., evaluating desirability and feasibility; purchasing intentions)
Process/ System 2	Automatic associations; reliance on salient cues and easily accessible information / heuristics (e.g., source attractiveness, message length, design, and aesthetics)	Automatic and easily retrieved content; impressions and gut feelings (general purpose heuristics)	Automatic activation of content (conceptual and affective clusters), leading to approach or avoidance
Output	Attitudes	Judgments	Behaviors
Conditions and moderators affecting S1 vs. S2 Processing			
Enduring	Need for cognition Knowledge & expertise Goals Self-schemas Counter-factual thinking Regulatory focus	Intelligence Critical thinking ability Cognitive Reflection Test Knowledge & expertise	Trait self-control Working memory capacity Self-regulation (e.g., restraint standards) Regulatory focus Habit
Situational	Cognitive load, time pressure Involvement/Relevance Regulatory focus Arousal Mood	Cognitive load, time pressure Training Regulatory focus Priming Mood	Cognitive load, time pressure Involvement (purchase importance) Accountability Visceral states (e.g., intoxication) Need deprivation Regulatory focus Priming Mood

Studies on dual-system theory suggest that contextual factors, dispositions, motivations for processing information, mood, and level of involvement are key determinants behind which system will be used to process cues. These elements can also dictate the weight assigned to each system (Petty et al., 1983). Individuals' involvement may vary by their cognitive capacity, perceived relevance of the information to their goals (Jun & Vogt, 2013), and their prior knowledge or expertise in the product domain (Samson & Voyer, 2012). These factors then influence individuals' information processing mode. The effect of System 1 tends to be positively related to task importance (when a decision has important consequences) and involvement (when a consumer anticipates a need to justify the decision to others). By contrast, System 2 processing is strengthened through habits, lower cognitive resources, good mood, need deprivation and habitual mechanisms (e.g., tending to browse technology sections in stores) (Strack et al., 2006).

Dual-system models have been applied extensively in cognitive and social psychology (e.g., persuasion, attitude change, judgment and decision making, and reasoning) (Samson & Voyer, 2012; Smith & Decoster, 2000). However, they have been rarely investigated in travel and tourism. Some tourism studies have employed a dual-system approach to examine decision rules of shopping and sightseeing choices (Law & Au, 2000). Others have considered how the two systems operate during the information search or destination choice phases (Jun & Holland, 2011; Jun & Vogt, 2013; McCabe et al., 2015). To date, no study has integrated dual-system processing into a conceptual model of tourism decision making to capture stepped decisions toward tourism products.

Jun and Vogt (2013) proposed three reasons behind the lack of attention to dual-system theory in tourism decision-making research. First, dual-system models are considered less applicable to intangible or experiential products when an individual is highly motivated for information processing. The systems may co-occur in this case, which mitigates the interaction effects and produces statistically non-significant results. This study argues that during decision making in motion, which is rapid, spontaneous, unreflective, and intuitive, the motivation for information searches and information processing may not be high. Second, dual-system theory regards situational involvement, particularly information processing motivation and the decision maker's capacity, as a moderator of information processing strategies. Studies on travel information processing have largely focused on individuals' intrinsic characteristics and their physical/social environment; only a few have evaluated situational involvement (Jun et al., 2007; Stewart & Vogt, 1999). However, situational involvement may prove valuable in explaining decision modifications during a trip due to ongoing situational changes from multi-goal interactions and environmental shifts (Jun & Vogt, 2013). Third, the assessment of causal and moderation effects via a dual-system approach is more amenable to experimental methods, which are less common in tourism research.

Recent developments in the economy and ICT has influenced tourists' choice behaviours and choice contexts, revealing the appropriateness of the dual-system approach (McCabe et al., 2015). As tourists become more experienced and value-conscious, different information processing strategies (or a mix) are expected to be employed across contexts to inform decisions about travel products. Many such decisions will likely involve intuitive judgments with little conscious reasoning (Evans, 2008). In addition, habitual decision making appears to follow this course of action (i.e., similar to System 2 processing). Other decisions are made in a manner more

akin to System 1 processing. Considering the duality of the mind and the roles of dual processes in persuasion, judgment, and consumption behaviours can deepen knowledge of tourists' decision-making processes. For marketing practitioners, the effectiveness and efficiency of marketing can be improved by promoting two-way processing of product-related information (Samson & Voyer, 2012).

3.3.3 Information Processing Strategies and Heuristics

Consumer decision making typically consists of a set of alternatives described by individual attributes (Payne et al., 1991). When exposed to extensive marketing information, consumers adopt different rules or strategies to absorb, structure, and integrate information to reach a choice among alternatives with different attributes (Moutinho, 1987). The information processing strategies are characterised by aspects of choice alternatives: the total amount of information processed; selectivity in information processing; the processing pattern (e.g., brand- or attribute-based processing); and whether the strategy is compensatory (Bettman et al., 1998).

A classic information processing strategy is compensatory, assuming that consumers can combine information about alternatives to assess the importance of each attribute in the choice set. From there, consumers can form an overall evaluation of or attitude toward each alternative; the alternative with the highest score will be selected. The weighted adding strategy typically reflects this compensatory rule. This strategy is extensive, consistent (not selective), and alternative-based (Bettman et al., 1998). However, the approach places great demands on an individual's working memory, computational capabilities, and decision-making involvement. Given the limitations of core capacities such as vision or memory, people cannot run such complex mathematical calculations. Moreover, many consumers are unlikely to employ complex cognitive strategies to

make inferences, estimations, and judgments involving substantial cognitive effort. They are similarly unlikely to resolve difficult value trade-offs.

In real-life situations, decision makers often aim to achieve decision goals as efficiently as possible. People adopt simplified strategies to deal with situations involving sparse resources such as time, knowledge, and computational power (Marewski, Gaissmaier, & Gigerenzer, 2010). Heuristics or rules of thumb are effort-reduction methods to make decisions more quickly and frugally; these methods integrate less information and require people to examine fewer cues and alternatives. The notion of adaptive decision making suggests that people rely on shortcuts, especially for decisions that are not important enough to warrant spending time and effort to identify the best course of action. Adaptive decision making thus allows for a beneficial trade-off between accuracy and effort (Payne et al., 1993). Psychology research has assumed a heuristics-biases position. In this case, logic and statistics rules are linked to rational reasoning, whereas heuristics are related to suboptimal, error-prone intuitions or irrationality and subject to systematic cognitive biases (Gigerenzer & Gaissmaier, 2011). However, evidence from various domains suggests that simple heuristics can be even more accurate than logical, statistical methods when solving real-world problems (Marewski et al, 2010). Ignoring some parts of information can elicit more accurate results than weighing and adding all information in a standard manner. The 'less-is-more' effect therefore applies: more information is not always better; rather, it can be harmful.

Gigerenzer and Gaissmaier (2011) pointed out that individuals can use simple heuristics rationally or irrationally and in a flexible manner. Instead of relying on a universal tool to solve tasks, people adopt various heuristics that are often developed in-situ. These heuristics are contingent upon task demands to deal with limited cognitive capacity, complex information contexts, and an array of choice alternatives (Bettman et al., 1998). Individual differences have

been identified in how people respond to decision tasks. Individuals may also employ different rules or strategies when facing diverse tasks. Simon (1990) stressed that human behaviour is a function of cognition and the environment, "shaped by scissors whose two blades are the structure of task environments and the computational capabilities of the actor" (p. 7). Relatedly, Moore, Smith, and Gonzalez (1997) noted that situational cues activate information processing schemas specific to personality differences. Research has shown that numerous factors can affect processing strategies. Examples include variability in the relative attractiveness of alternatives (Malhotra, 1982), the choice context (e.g., time pressure, information presentation format, cognitive differentiation, and prior experience and knowledge) (Maule, Hockey, & Bdzola, 2000; Bettman & Kakkar, 1977), the amount of information available for memory searches, and social factors (Hyde, 2008).

According to Marewski et al. (2010), humans possess a repertoire of cognitive strategies, called the adaptive toolbox of heuristics. Individuals can use this toolbox to solve specific decision problems in specific environments. The interplay between cognitive limitations in the human memory system (e.g., forgetting information) and information structure in a given environment determines the heuristics chosen to solve a specific task. By exploiting humans' core capacities and the structure of the physical and social environment, highly specialised heuristics enable people to make inferences, construct preferences, and interact with others. The use of the adaptive toolbox can also yield accurate, fast, and effortless judgments (Hyde, 2008).

Based on the notion of the adaptive toolbox of heuristics, this study proposes that tourists will likely use their heuristic repertoires to facilitate travel-related decision making. The recognition heuristic is a typical example; with it, individuals make inferences based on a sense of recognition (i.e., familiarity) retrieved from memory (i.e., non-compensatory inferences). The

recognised alternative has a higher value on a quantitative criterion than another unrecognised alternative. The recognition heuristic can be applied to tourists' decision making by searching for recognition information and ending an information search once an alternative is acknowledged and another is not (Marewski et al, 2010). For instance, tourists tend to choose destinations or service products with which they are familiar over other alternatives.

The recognition heuristic fails to operate when two alternatives are recognised; however, the fluency heuristic fills this gap. Repeat tourists may adopt this strategy in destination decision making (McCabe et al., 2015). If a tourist has recognised two destinations visited previously, but one was retrieved faster from memory, then that destination is deemed to be of greater value with respect to a certain criterion. A variant of the fluency heuristic has been proposed in situations when alternatives are not simultaneously apparent but generated sequentially from memory. In this instance, the individual selects the first alternative that comes to mind (Marewski et al, 2010).

Whereas recognition and fluency heuristics rely on information recognition to make decisions, other heuristics base decisions on 'clever cues' (i.e., alternatives' attributes). A classic example is the take-the-best heuristic, a lexicographic heuristic (Payne et al., 1993). The take-the-best heuristic simplifies decision making by considering cues according to validity (i.e., the probability that an alternative has a higher value on a criterion, such as quality, than another alternative) and using the first clue that discriminates between alternatives. In the tourism context, a traveller may rank restaurant attributes sequentially by relative importance; then, the restaurant with the best value on the most important attribute (e.g., cleanness or price) is likely to be selected. This strategy involves limited, attribute-based, non-compensatory processing that is selective across attributes and consistent across alternatives. A range of determinants encourage the use of

the take-the-best heuristic: time pressure, high working memory load, and the need to retrieve cue information from memory rather than being presented with the information (Marewski et al., 2010).

Social heuristics are exclusively based on social information. Examples include imitating the majority or the success, tit-for-tat, and social-circle heuristics. Individuals may also average others' judgments to exploit the 'wisdom of crowds' (Gigerenzer & Gaissmaier, 2011). This method is particularly helpful for tourists with little knowledge of alternatives; for instance, an inexperienced tourist may select a destination that is popular within his social circle.

Furthermore, tourists may combine strategies or heuristics when making decisions. When faced with an ever-growing product assortment on store shelves or online, the recognition heuristic could appear in an initial phase of the decision-making process to quickly eliminate alternatives from further consideration. This heuristic would likely be followed by a more careful evaluation of the remaining options. Such evaluation may involve a trade-off between price and reliability to result in a final choice.

Consumer researchers have taken an information processing perspective to study decision making. This approach focuses on the details of decision making underlying choices; it involves several basic components such as cognitive processing, motivations/goals, attention and perception, information acquisition and evaluation, and memory. Consumers are thought to make decisions to achieve goals. As such, they devote attention to available information that suits those goals. Individuals therefore actively collect, process, and interpret information from various sources to reach a choice among alternatives (Simon, 2014).

As discussed earlier, people select or develop specific strategies, including simplifying methods and heuristics, to achieve situation-appropriate goals. These strategies could evoke

different information integration processes. Preferences, judgments, and choices among alternatives are highly sensitive to decision tasks, situational needs/constraints, and environmental changes during a decision episode. The course of decision making also depends on contextual factors such as the place, physical surroundings, social setting, point in time, and individuals' antecedent states (e.g., moods and physical conditions) (Payne et al., 1993). Furthermore, how a strategy or solution to a decision problem is constructed is a function of individual differences in processing capacity and level of expertise or knowledge. This thesis draws on the extant literature. Then, it moves beyond the structured, puzzle-like choice problems commonly manipulated in a controlled laboratory to tourism decisions occurring in naturalistic, ambiguous situations.

3.4 Conceptual Gaps

As discussed in Chapter 2, tourists' decision making is an adaptive process with myriad contextual influences. Many choices are based on subjective perceptions or evaluative judgments constructed from contextual 'facts'. In response to a call for the investigation of the dynamic and complex interactive process between individuals, decision tasks, decision contexts, and decision strategies in natural settings (Lipshitz et al., 2001), this study examines real-world decisions emerging in dynamic environments where information cues are ubiquitous and dynamic. The study focuses on tourists' cognitive processes geared toward certain decision situations along with adaptive, spontaneous characteristics of decision making. Based on an extensive literature review to explore the fundamental concepts, elements, and meanings of decision making, this study proposes that tourists' decision making in motion involves co-evolution and interplay among three core components: 1) decision tasks, 2) decision contexts, and 3) individual information processing systems. The conceptual framework (Figure 3.3) grounded in decision-making, environmental

psychology, and information processing theories illustrates the conceptual gaps identified in the literature and sought to be addressed in this study.

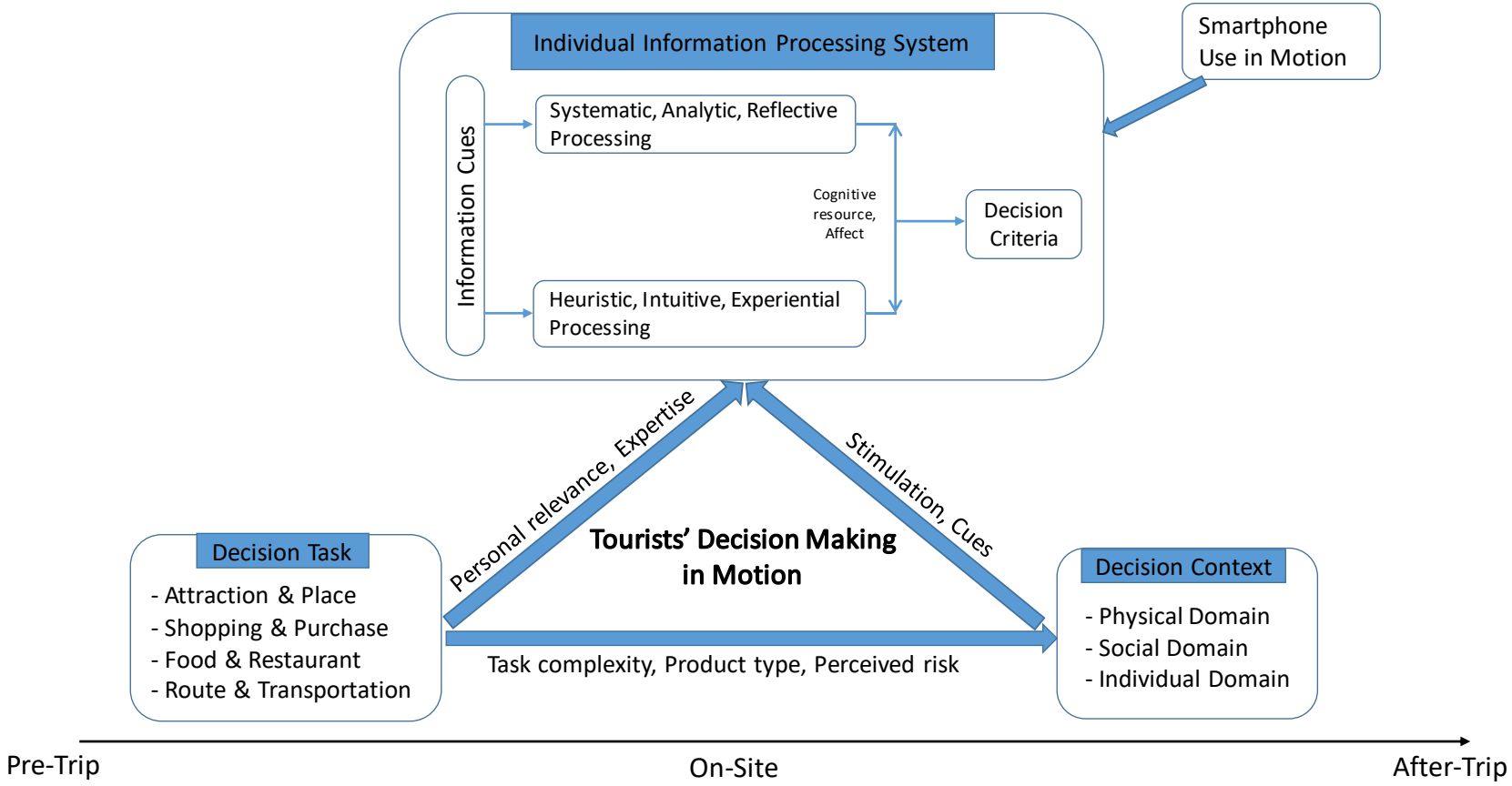


Figure 3. 3 Conceptual Framework of the Current Study

This study explains, understands, and investigates tourists' decision making in motion that comprises a multi-faceted process involving multiple travel-related decision tasks about different travel products. Previous studies on tourists' decision making are limited in focusing on specific decision tasks or specific stages in the travel decision-making process. This study attempts to fill this gap by examining tourists' decision making in motion across different kinds of decision tasks. *Decision tasks* capture various tourism products and services (e.g., attractions and places, food and restaurants, shopping and purchases, and routes and transportation) involved in tourists' decision making in motion. Characteristics of various *decision tasks*, such as task complexity, task significance, product type, and task uncertainty (Waller & Mitchell, 1984), frame the *decision contexts* in which tourists are immersed. Moreover, task-related factors including tourists' prior knowledge or expertise in the product domain (Samson & Voyer, 2012) and the personal relevance of the task (Jun & Vogt, 2013) can influence the level of involvement, in turn affecting *individuals' information processing*.

This study defines *decision contexts* as contexts within which spontaneous travel-related decisions emerge while tourists are exploring a destination. Environmental psychology literature suggests that individuals interpret, assess, comprehend, cope with, adapt to, and shape their natural and social environments (Giuliani & Scopelliti, 2009; Stokols, 1978). Such processes have an effect on their affective and behavioural consequences. Thus, the dynamic interaction between on-the-go tourists and various dimensions of spatiotemporal contexts (Couclelis, 2009) in which tourists are immersed is taken as the unit of analysis in this study. This highlights the ongoing, spatiotemporal, interdependent nature of tourists' decision making in motion. In line with previous research, this framework proposes that a decision context generally involves three dimensions: physical, social, and individual dimensions. However, current studies and frameworks lack

detailed information about the description or property of each dimension and how these dimensions affect decision making. According to stimulation theories, the context is a source of sensory information or stimulation, such as properties of the environment (e.g. temperature, noise, sound, color, and air pressure) and influence of other people (e.g. crowding and social isolation). These contextual stimuli are potential sources of psychological stressors to the extent that they tax people's resources physiologically and behaviourally (Gifford, 2007). This in turn would result in "a quantitative shift in the distribution of judgmental or affective responses along a stimulus continuum" (Wohlwill, 1974, p. 134). In this regard, decisions are the results of exposure to incoming stimulation in a certain context. Furthermore, the proposed framework suggests that tourists selectively extract and make sense of a few contextual attributes to assist them in coping with a *decision task.* Those stimulating cues come from the dynamic interaction between tourists and current contexts which initiate tourists' *information processing* and decision making.

The third component, *individual information processing system*, concerns the information cues tourists attend to, how they collect and process information, and the rules or heuristics they use to make judgments and decisions while in motion. Informed by information processing theory, this framework proposes that tourists use different systems to organise and process information, consequently constructing preferences and judgment (rather than innate) within the context of each decision problem. Previous research has proposed some common types of information processing. However, there is no clear distinction between the parallel interacting systems proposed by dual-system theory (McCabe et al., 2015). This study suggests that there are different ways to distinguish and classify information processing systems. Specific characteristics of tourists' information processing on the move will be explored and identified based on data collection and analysis to suit the research context. On-the-go tourists employ different rules or strategies to

absorb, structure, and integrate information when facing diverse *decision tasks*. A variety of simplified strategies or heuristics are often developed in-situ to deal with sparse resources such as time, knowledge, and computational power (Marewski et al., 2010). The use of information processing systems and strategies can be influenced by various task-related factors (e.g. task importance) and contextual factors (e.g. motivations, feelings or mood states, involvement). Thus, this framework proposes that tourists' information processing during decision making in motion is a function of the structure of *decision task* and *decision context*. The current study investigates the extent to which factors from multiple dimensions of decision contexts explain tourists' information processing behaviours around various tourism products throughout the processes of decision making in motion.

Furthermore, as discussed in Chapter 2, smartphones' instant information support and social connection may influence tourists' information processing during decision making processes. As such, this study proposes that the individual information processing system can be influenced by smartphone use on the move. More efforts are required to identify the use of smartphones by on-the-go tourists and to explore the roles of smartphones in tourists' decision making in motion. Although some aspects of the aforementioned theories have been operationalised in empirical research, in a rather ad hoc fashion (McCabe et al., 2015), they have been undertaken in isolated studies rather than being integrated into models of tourists' decision making.

3.5 Summary of the Chapter

This chapter provides a theoretical foundation for the investigation of the phenomenon of tourists' decision making in motion. This study investigates tourists' decision making in motion

through identification and interpretation of multiple concepts: people's perceptions of complex information spaces; the rules, heuristics, and themes embedded within tourists' discursive accounts of their decisions toward various travel products. This study adopts conceptual knowledge from core disciplines of consumer research and psychology to explore these concepts and provide a foundation for the design and implementation of the study. Three streams of literature and theories are critically examined for the application in this study.

First, variance theories of decision making are reviewed to identify the extant literature and find support for the phenomenon of decision making in motion. Among the six paradigms of decision making, NDM provides a pragmatic, realistic approach to study real-world decision making. Rather than focusing on input-output variables, NDM emphasises cognitive processes geared toward certain decision situations by considering the effects of contextual factors along with adaptive characteristics of decision making. However, NDM has several inadequacies. First, it mainly focuses on decision-making processes among proficient decision-makers rather than those among consumers. Second, it overlooks that many spontaneous decision characteristics apply while on the move. Third, NDM does not address the increased mediation of information technology (e.g., smartphones) on the decision-making process. This study expands NDM by exploring tourists' decision making in motion and the influence of smartphones on this process.

Second, environmental psychology provides a profound knowledge of the environment, context, human behaviour and experience, and the relations among them. Theories in environmental psychology have been widely adopted to examine the effects on environmental factors on consumers' affective and behavioural consequences. Although research has investigated and modelled the dimensions, description, or properties of the context within which behaviour processes occur, previous findings and propositions appear to be fragmented and lack of systematic

conclusions on the aspects constituting a context that affect individuals' behaviours. Furthermore, previous studies mainly focused on retail settings; however, the characteristics of other service settings have been rarely studied. Thus, there is a need for a comprehensive, systematic conceptualisation of real-world contexts in travel settings (Clitheroe et al., 1998).

Third, the review of information processing literature provides a basis for understanding tourists' information processing during the decision-making process. Dual-system theory postulates two distinct modes of cognitive processing behind decision making. It has enriched understanding of consumers' information judgment and information processing by identifying and summarising some common aspects. However, there is no clear distinction between the two systems and there are different ways to distinguish and classify the patterns of information processing (McCabe et al., 2015). Consumers adopt different rules or strategies to absorb, structure, and integrate information. Research has identified and characterised information processing strategies by aspects of processing choice alternatives: the amount of information processed, selectivity in information processing, processing pattern (e.g., brand- or attribute-based processing), and whether the strategy is compensatory (Moutinho, 1987; Bettman et al., 1998). Moreover, previous studies indicated that people adopt an adaptive toolbox of heuristics to solve decision problems in specific contexts. Information processing strategies or heuristics can be affected by task characteristics (Shaki & Gevers, 2011); cognitive differentiation (Marewski et al., 2010; Gigerenzer & Gaissmaier, 2011); and contextual factors (Malhotra, 1982; Maule et al., 2000; Bettman & Kakkar, 1977).

Analysis of the reviewed literature has identified the conceptual gaps that impede the direct application of these extant theories and finding in this study. Therefore, it is crucial to develop a framework to describe the phenomenon of tourists' decision making in motion. The next chapter

details the research design guiding the investigation of the research questions and procedures employed to implement this study.

CHAPTER 4: METHODOLOGY

This chapter outlines the paradigm guiding the research design and methods used to realise the study objectives. The rationale for choosing a post-positivism paradigm and qualitative approach is discussed. The methods applied in this study (i.e., process tracing and in-depth interviews) are then introduced. Next, the research procedures are described, including data collection and analyses. Lastly, trustworthiness considerations are presented.

4.1 Research Design

4.1.1 Paradigm

Investigation of a research problem is influenced by the researcher's belief systems and philosophical assumptions. A paradigm is a set of fundamental beliefs or metaphysics representing a worldview (Guba & Lincoln, 1994). In research, a paradigm guides the researcher's actions and lays the foundation for problem formation. A chosen paradigm also informs the methods used to answer research questions (Creswell, 2013). Paradigms include several characteristics: ontology, which relates to the nature and form of reality (i.e., what can be known about reality); epistemology, which deals with the origin, nature, and limits of human knowledge (i.e., what counts as knowledge and how knowledge is known); and methodology (i.e., discovering what the inquirer believes can be known) (Annells, 1996). Guba and Lincoln (1994) discussed four basic inquiry paradigms—positivism, post-positivism, critical theory, and constructivism — with respect to ontology, epistemology, and methodology (Table 4.1).

Table 4. 1 Basic Beliefs (Metaphysics) of Alternative Inquiry Paradigms (Guba & Lincoln, 1994, p. 109)

Item	Positivist	Postpositivism	Critical Theory et al.	Constructivism
Ontology	Naive realism-"real" reality but apprehensible	Critical realism-"real" reality but only imperfectly and probabilistically apprehensible	Historical realism-virtual reality shaped by social, political, cultural, economic, ethnic, and gender values; crystallized over time	Relativism local and specific constructed realities
Epistemology	Dualist/ objectivist; findings true	Modified dualist/objectivist; critical tradition/community; findings probably true	Transactional/ subjectivist; value-mediated findings	Transactional/ subjectivist; created findings
Methodology	Experimental/ manipulative; verification of hypotheses; chiefly quantitative methods	Modified experimental/ manipulative; critical multiplism; falsification of hypotheses; may include qualitative methods	Dialogic/dialectical	Hermeneutical/ dialectical

These four paradigms have been widely applied in recreation, leisure, and tourism research. Critical theory denotes a set of alternative paradigms including feminism, materialism, neo-Marxism, and participatory inquiry (Guba & Lincoln, 1994). Critical theory holds that the world is organised by overt and hidden powers; thus, study findings are influenced by the researcher's values. Numerous terms have been used when discussing positivism (e.g., scientific, rationalistic, and empiricism) and constructivism (e.g., naturalistic, interpretivism, and phenomenology). These two paradigms were traditionally based on distinct ways of knowing how to identify observed patterns. Constructivism involves an understanding derived from multiple realities, contextual processes focused on meaning, various social actions, and potential emerging theories (Gergen,

1985). Positivism is more deductive, rational, cause-and-effect oriented, and objective or value-free and based on *a priori* theories. A paradigmatic shift toward post-positivism has occurred within the past few decades; this approach provides an alternative way of thinking and knowing. Essentially, post-positivism recognised the inadequacy of dualistic thinking while acknowledging the multiplicity and complexity of lived human experiences. Post-positivism thus takes a broader view in examining real-world phenomena. Ontologically, the critical realism of post-positivism assumes an objective reality that can only be imperfectly apprehended. This reality is possible to approximate but is never fully known. Epistemologically, post-positivism's modified dualist, objectivist assumption emphasises external 'guardians'; replicated findings are potentially true but are always subject to falsification. Methodologically, post-positivism's modified experimental or manipulative methodology focuses on the falsification of hypotheses and may include qualitative methods (Guba & Lincoln, 1994).

Jennings (2001) indicated that "A paradigm is the overlying view of the way the world works; the methodology is the complementary set of guidelines for conducting research within the overlying paradigmatic view of the world; the methods are the specific tools of data collection and analysis a researcher will use to gather information on the world and thereby subsequently build 'theory' or 'knowledge' about the world (pp.34)." The researcher's chosen philosophical position depends on his/her ontological, epistemological, and methodological beliefs. These beliefs then guide the research design and serve as references in assessing research quality. The current study strives to explore the mechanisms behind tourists' decision making in motion, guided by an understanding of decision making as a complex, dynamic process. Neither a wholly interpretive nor a strictly positivist is capable to represent the multiplicity and complexity which are "hallmarks of humanity" (Ryan, 2006, pp.16). Post-positivism serves as a broad and pragmatic means to

examine the lived experiences in relation to leisure and tourism (Henderson, 2011); thus, it is applied to guide the design and methodology of this study.

Post-positivism offers a practical approach for studying tourists' decision making in motion by linking theory and practice, recognising the researchers' emotions and commitment to the topic, and legitimizing the potential for using multiple techniques for collecting and analysing data (Ryan, 2006). Following the post-positivism paradigm, this study does not aim to arrive at an overall 'truth' due to the complexity of the web of life and human experience. Rather, the researcher recognises the limits in research to access all areas of human experience. A critical post-positivist stance suggests that the reality of the world is imperfectly and probabilistically apprehensible and there is no neutral knowledge. Thus, this study pursues an accumulation of knowledge of tourists' decision making in motion with probable facts. Post-positivists regard the person, experience, and knowledge as multiple and relational (Ryan, 2006). Therefore, knowledge of decision making in motion cannot be separated from the individual and personal experience. The researcher takes up a learning role, rather than a testing role, and strives to engage in the social construction of narratives with the participants. Valid knowledge claims emerge as the issues raised during the process and conflicting interpretations of these interwoven ideas are discussed and negotiated (Ryan, 2006). Furthermore, this study places an emphasis on empirical evidence. The post-positivism paradigm allows for the use of natural settings and situational/contextual data and recognises a need for other forms of inquiry such as visual analysis (Henderson, 2011), which can provide the most useful information for answering research questions in the current study. Another benefit of post-positivism is that it enables researchers to be reflective; researchers' position regarding a topic aligns with theoretical orientations (Dupuis, 1999). Thus, a well-

developed post-positivism approach can uncover a more complete picture of human decision making, presenting a more reflective way to improve accuracy and avoid biases.

4.1.2 Qualitative Research

Researchers have adopted quantitative and qualitative methods in social science. Quantitative methods, which focus on statistics and casual relationships, have advantages such as providing readily available and unambiguous information (Ryan, 2006). These approaches also offer more concrete measurements for data consistency and accuracy. However, some researchers have recognised that humans experience the world in a qualitative manner. Knowledge is not always neutral, and raised questions can reflect particular interests. Quantitative research is often highly structured; therefore, associated methods may neither consider individual cases in detail nor allow the researcher to probe into unexpected outcomes or information (Ryan, 2006). Considering the complexity of life and human action and experience, data cannot always be aggregated to arrive at an overall 'truth'. For instance, individuals' shifting feelings toward objects, or the development of thoughts and choices, cannot be conceptualised via a logic-deductive scientific method to reach a correct answer. Qualitative research is often essential in this context. Because individuals can behave subjectively and differently across situations, facts are not always objective or observable in the social world.

Qualitative researchers believe that the social world should not be viewed the same as the natural world; rather, it should be understood through explanation and description of individuals' experiences and perceptions (Savin-Baden & Major, 2013). Compared to quantitative research, qualitative research seeks to provide an in-depth picture of people's lived experiences by obtaining detailed, rich information to interpret culturally significant phenomena (Ryan, 2006). Qualitative

researchers focus on "how the social experience is created and given meaning" with an emphasis on the "socially constructed nature of reality" (Denzin & Lincoln, 2007, p. 14). The focus of the present study is tourists' decision making in motion, which is fast, spontaneous, and intuitive. Many possible causes of a problem situation are unknown due to a lack of studies on this topic. A qualitative research design is thus suitable for this study.

Various approaches have been used for qualitative research (e.g., phenomenology, narrative approach, grounded theory, ethnography, participant observation, and case study) (Creswell, 2013). This study aims to shed light on tourists' decision making in motion. The research questions are as follows: (1) How do spontaneous decisions emerge while tourists are exploring a destination? (2) How do tourists process various information cues presented in different formats while in motion? and (3) How do smartphones affect these activities? A phenomenological approach was adopted to investigate these questions.

Phenomenology is a science of consciousness that focuses on what appears in consciousness from the first-person point of view (Smith, 2006). It provides a systematic approach for the discovery of the meaning and the general structure, and the essences of lived experiences of the phenomenon (Creswell, 2013). Based on close examination and thick descriptions of lived experience, phenomenologists focus on how meaning is created through embodied perception (Starks & Brown Trinidad, 2007). This approach lays an interpretive foundation for empirical studies of mind. Such studies can involve human perception, emotion, thought, reasoning, desire, awareness, and embodied action. Phenomenology is valuable in tourism studies because it can generate explanations of "[the] structure of conscious mental states, or experiences, especially intentionality, that is, the way in which mental states represent or are directed toward various things" (Smith, 2006, p. 1). Phenomenology is useful for studying tourists' decision making in motion

outside the confines of existing theories and established constructs (Ehrich, 2005). This approach can yield new insights along with a clearer understanding of uniquely complex processes.

Phenomenological research can entail numerous methods. Approaches are dependent on the research purpose, the nature of research questions and data, characteristics of the phenomenon of interest, and the researcher's skills (Hein & Austin, 2001). Polkinghorne (1989) explained, "the investigation of conscious (or 'lived') structures involves distinguishing those aspects of an experience that are invariant and essential, making the experience show up as the kind it is—that is, as the typical way in which a phenomenon presents itself in experience" (p. 42). In doing so, descriptive or interpretive techniques can provide clear and accurate descriptions of the phenomenon under investigation, including its constituent parts or elements and their interrelationships (Hein & Austin, 2001). Data can be gathered from several sources such as the researcher's experience, the phenomenon's etymology, others' descriptions via interviews or observations, and the literature (Ehrich, 2005).

Following a phenomenological approach, this study focuses on individuals who have experienced the phenomenon under investigation (Starks & Brown Trinidad, 2007). Participants provided a detailed account of their experiences. However, the focus of the phenomenological inquiry is the essence of a phenomenon rather than participants' subjective experiences (Ehrich, 2005). The researcher thus endeavours to suspend his/her beliefs, biases, and presuppositions to let the phenomenon reveal itself. The post-positivism paradigm considers inquiry a series of logically related processes, considers multiple participant perspectives, and applies multiple levels of data analysis (Creswell, 2013). This process is exemplified through a systematic and disciplined approach. The value of phenomenology in this study involves explorations of the meaning of tourists' decision making in motion and relevant essential structures of meaning.

4.1.3 Methods

4.1.3.1 Process Tracing

Process tracing has been used in judgment and decision making to produce detailed, explanatory models of decision-making behaviour (Payne, 1976). This approach enables traces of cognitive processes to be identified through the acquisition and use of cognitive representations. This study employed a process-tracing technique from cognitive psychology: verbal protocols or verbal reports. The method was used to gain insight into human cognitive processes when making decisions. Verbal protocols, typically based on a think-aloud approach (i.e., verbally reporting thought processes without descriptions and explanations), refer to verbalisations of individuals' thoughts and successive behaviours while performing cognitive tasks (Ericsson & Simon, 1993). The use of verbal protocols within an information processing framework has continued to develop since the 1970s. Related research has made valuable contributions to the body of knowledge around human judgment and decision making. Verbal protocols provide informative data that are useful in constructing detailed decision process models for certain types of decisions or judgments. These protocols are also helpful in testing hypotheses about aspects of process models (Ranyard & Svenson, 2011). Compared to other information process methods, the preliminary advantage of the protocol method is that it traces one's decision process and facilitates interpretation. This unique feature is particularly valuable for exploratory research in the absence of a well-founded theory to guide investigation of the target decision process (Kuusela & Pallab, 2000).

Regarding process tracing for decision making, subjects are instructed to verbally report conscious cognitive thoughts as they emerge. Subjects should not try to explain, interpret, or analyse such thoughts. According to information processing theory, subjects can accurately recall

retrospective thoughts for cognitive processes if verbal reports are collected immediately after task completion. Concurrent protocols (collected during actual decision making) and retrospective protocols (gathered after a decision has been made) provide reliable information about underlying cognitive processes. These protocols have been used extensively in marketing and management research (Ericsson & Simon, 1993).

In this study, think-aloud protocols seemed the most effective way to collect rich information about tourists' complex cognitive activities that could not be obtained through other means. This method is particularly suitable for real-time situations under substantial time pressure. Protocol quality is high when tasks are unfamiliar and complex, as most travel decision tasks tend to be (Schkade & Payne, 1994). However, the usefulness of verbal protocols is limited when subjects rely on unconscious processes. As Wilson (1994) suggested, such weaknesses may be mitigated by including other methods to assess the completeness, reactivity, and validity of verbal protocols. Considering the research questions in this study, data collection focused on capturing several characteristics: tourists' movement through the information space, their information search and processing activities, and decision-making processes in a destination. The research also sought to identify the roles of smartphones in these processes. This study adopted process-tracing techniques to illuminate pre-decisional behaviours in the situational analysis by tracing individuals' steps of arriving at a decision (Kuusela & Pallab, 2000). A tourist day trip (i.e., an independent city tour) was traced using recording technologies (i.e., wearable cameras and GPS loggers). Additionally, think-aloud protocols were gathered by asking tourists to verbally express what was going through their minds when performing main tasks; these reports functioned as descriptions of cognitive processes (Harte, Westenberg, & van Someren, 1994).

4.1.3.2 In-depth Interviews

Face-to-face, in-depth interviews have been widely adopted to explore complex concepts in human and social sciences. In this case, knowledge is produced through interactions between the researcher and participants. The main purpose of interviews is to contribute to a body of knowledge that is abstract, conceptual, and theoretical. By eliciting stories from participants, interviews can enhance the researcher's understanding of individuals' life experiences that cannot be observed directly. Such features include intangible aspects including feelings, thoughts, affects, and thoughts. Moreover, this approach is useful for learning about human behaviour during past events, which cannot be easily accomplished through other methods (Maxwell, 2012). Moreover, a semi-structured or unstructured approach is generally adopted when the researcher does not know what he/she does not know. This study involved face-to-face, semi-structured interviews with a free conversational style. The approach left room for interviewees' spontaneous answers and unplanned questions that emerged during conversations (DiCicco-Bloom & Crabtree, 2006).

Interview protocols involving a series of open-ended questions were prepared to ensure the interviews followed general guidelines. These questions also reminded the researcher to prevent conversations from straying too far from the research design or goals. Questions served as reference points when a conversation became unproductive. Interviews involved two stages. Before embarking on the day trip, pre-trip interviews addressed tourists' general plans for the day to assess trip flexibility and identify unplanned behaviours that occurred throughout. At the end of the day trip, post-trip interviews were conducted to clarify decision making in motion using process-tracking data (i.e., video recordings). Participants were asked to recall details of their decision making in motion and describe these processes.

4.2 Data Collection

4.2.1 Participant Qualifications and Recruitment

Qualitative studies seek to reveal a shared understanding of the target population (DiCicco-Bloom & Crabtree, 2006). Subjects should share critical similarities related to the research question. Participants should also be selected purposefully to maximise the potential depth of data to adequately address the research problem. Therefore, participant selection should be based on whether individuals meet certain criteria to provide useful information.

To develop rich descriptions of tourists' decision making in motion, participants were selected based on specific criteria. The researcher also considered several issues when determining participant suitability: the kinds of participants to be included, the time when interviews would be conducted (e.g., workdays or weekends), the processes to be studied (e.g., unique or routine events), and the interview setting (e.g., hotel lobby or public area).

This research targeted urban tourists in Hong Kong. Eligible participants met the following three criteria:

(1) Free independent visitors (package visitors have limited freedom during trips);

(2) First-time visitors (to minimise the impact of previous experience); and

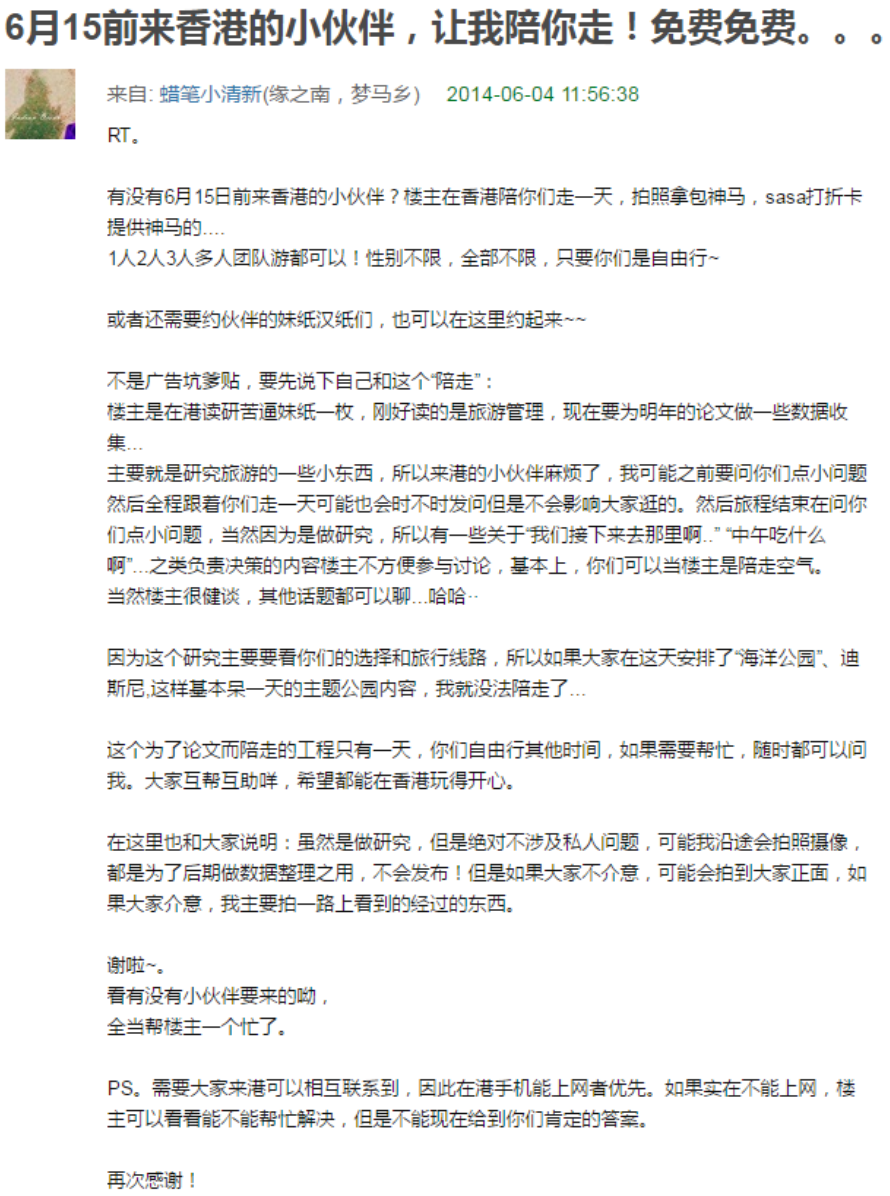
(3) Visitors who planned at least 1 day for sightseeing, shopping, or both in the city.

Three additional variables were considered in sample selection: travel party size (i.e., alone, 2 people, 3 or more people), trip flexibility (i.e., extent to which the trip was pre-planned), and smartphone use (i.e., whether a smartphone was used to support decision making). First, the size

of the travel party was considered to assess the impact of social input (e.g., accountability) (Payne et al., 1993) and distributed cognition on decision making in motion. Second, the degree of day-trip flexibility could influence decision making in motion. Third, tourists' smartphone-mediated decision processes were compared to those not mediated by smartphones. This study investigated how decisions emerged in three types of trips: well-planned trips (i.e., a completely planned hierarchy of tourist decisions); moderately planned trips (planned higher-level activities such as attractions, but unplanned lower-level decisions such as meals); and mostly unplanned trips (e.g., only planned an area to visit with the main purpose such as shopping). Different types of decisions were expected to emerge (e.g., in transportation, travel routes, restaurants, and spontaneous activities). In particular, the roles of smartphones under different decision circumstances (i.e., when smartphones were used and how they affected information processing strategies) were examined as the focus of this study.

The researcher recruited participants for a pilot study and the formal study. Potential participants were approached in several ways. The researcher anticipated difficulties in recruiting participants because this study required active participation. Therefore, the researcher collaborated with Hotel ICON in Hong Kong, a teaching and research hotel wholly owned by The Hong Kong Polytechnic University. The hotel has been named one of the world's finest per Forbes Travel Guide's Global Star Ratings (2017). An invitation letter was placed in the hotel's lounge area (Appendix I). The researcher also stood in the hotel lobby and invited hotel guests to participate. Second, participants were recruited online, including through virtual travel communities such as Tripadvisor.com and Qunar.com (the top virtual travel community in Mainland China). Social networking sites were also used, such as Douban.com, a Chinese social networking service that also recommends potentially interesting films, books, recent events, and activities to users. Online

platforms and groups on these websites allow registered users to create content related to topics such as films, books, music, and travel. First, a keyword search was conducted on these websites using keywords such as “Hong Kong” and “Hong Kong tourism” to find online platforms related to Hong Kong tourism. Then, potential tourists who were going to visit Hong Kong were approached through advertisements on these platforms containing relevant information about the study. An example of an advertisement posted to a group entitled “I want to go to Hong Kong” on Douban.com is shown in Figure 4.1.



6月15前来香港的小伙伴，让我陪你走！免费免费。。。

来自: 蜡笔小清新(缘之南，梦马乡)　2014-06-04 11:56:38

RT。

有没有6月15日前来香港的小伙伴？楼主在香港陪你们走一天，拍照拿包神马，sasa打折卡提供神马的....
1人2人3人多人团队游都可以！性别不限，全部不限，只要你们是自由行~

或者还需要约伙伴的妹纸汉纸们，也可以在这里约起来~~

不是广告坑爹贴，要先说下自己和这个"陪走"：
楼主是在港读研苦逼妹纸一枚，刚好读的是旅游管理，现在要为明年的论文做一些数据收集...
主要就是研究旅游的一些小东西，所以来港的小伙伴麻烦了，我可能之前要问你们点小问题然后全程跟着你们走一天可能也会时不时发问但是不会影响大家逛的。然后旅程结束在问你们点小问题，当然因为是做研究，所以有一些关于"我们接下来去那里啊.." "中午吃什么啊"...之类负责决策的内容楼主不方便参与讨论，基本上，你们可以当楼主是陪走空气。
当然楼主很健谈，其他话题都可以聊...哈哈~

因为这个研究主要要看你们的选择和旅行线路，所以如果大家在这天安排了"海洋公园"、迪斯尼,这样基本呆一天的主题公园内容，我就没法陪走了...

这个为了论文而陪走的工程只有一天，你们自由行其他时间，如果需要帮忙，随时都可以问我。大家互帮互助咩，希望都能在香港玩得开心。

在这里也和大家说明：虽然是做研究，但是绝对不涉及私人问题，可能我沿途会拍照摄像，都是为了后期做数据整理之用，不会发布！但是如果大家不介意，可能会拍到大家正面，如果大家介意，我主要拍一路上看到的经过的东西。

谢啦~。
看有没有小伙伴要来的呦，
全当帮楼主一个忙了。

PS。需要大家来港可以相互联系到，因此在港手机能上网者优先。如果实在不能上网，楼主可以看看能不能帮忙解决，但是不能现在给到你们肯定的答案。

再次感谢！

Figure 4. 1 An Advertisement posted on Douban.com to Recruit Participant (An Example)

Potential tourists were also approached through the "Q&A" discussion platform on Douban.com. Open "Q&A" discussion platforms allow registered users to ask or answer questions; unregistered users can use these sites to find information of interest. Figure 4.2 displays an example.

Figure 4. 2 A Post on Discussion Platform on Douban.com to Recruit Participant (An Example)

The number of participants and the recruitment process are essential in research; a study sample can affect the quality of inferences from the study (Onwuegbuzie & Collins, 2007). A qualitative sample often contains a relatively small number of participants. The purpose of qualitative data collection is to acquire in-depth information from a particular group of people rather than to measure relationships between variables. A smaller sample does not compromise research quality; rather, it can elicit detailed information with greater accuracy because few informational units are involved. The number of cases was not estimated prior to conducting the

study. The appropriate sample size for qualitative inquiry depends on the purpose and scope of the study, the nature of the topic, and data quality (Morse, 2000). The data collection process continued until theoretical saturation, which occurs when no new information emerges from the data (Guest, Bunce, & Johnson, 2006). A preliminary design was proposed based on prior studies. The number of cases and sample selection were adjusted as data collection and analysis proceeded.

4.2.2 Data Collection Materials and Procedures

The focal context of this study was Hong Kong, one of the most popular tourist destinations in Asia. Hong Kong was ranked first in international tourist arrivals according to the Top 100 City Destinations Ranking 2017 (Geert, 2017). Most tourists (76%) are from Mainland China. Other major source markets for Hong Kong include Taiwan, South Korea, Japan, America, the Philippines, and Australia (HKTB, 2016).

Tourists in Hong Kong were invited to participate in the study by recording one day of travel around the city. In the morning, pre-trip interviews (approximately 30 minutes) were conducted before selected tourists began their day trips. To capture tourists' information cues and information spaces, travellers were equipped with wearable cameras (see Figure 4.3) and GPS data loggers (see Figure 4.4) (one per travel party) while strolling around the city during the day. Tourists were also asked to share their thoughts aloud while exploring the city, including when by themselves or during normal conversations with travel companions and other social actors. These discussions were recorded via the wearable camera. Recordings helped explain how these tourists made decisions (e.g., in shopping malls; dining and retail establishments; transportation hubs; and at tourist attractions). Post-trip interviews (30 minutes–1 hour) were conducted in the evening after tourists finished their trips (Figure 4.5).

Figure 4. 3 The Wearable Camera Enables to Record the Experience of Tourists' Day Trips

(Source: XM Official Website)

Figure 4. 4 The Wearable GPS Data Logger Enables to Record the Track of Tourists' Day Trips

(Source: Victory Technology Co., Ltd. Official Website)

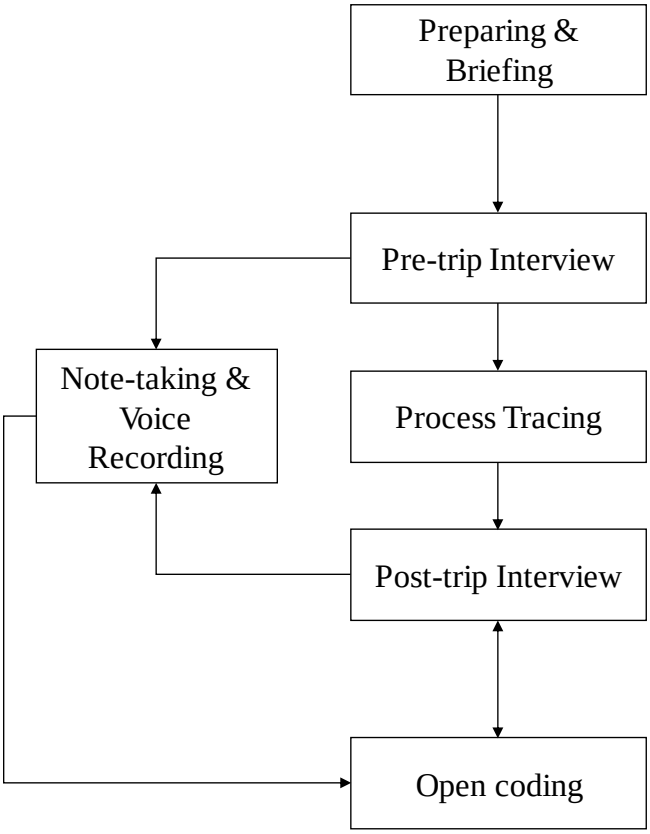


Figure 4. 5 Data Collection Structure and Procedure

A pilot study was first conducted in Hong Kong, during which 6 tourists were recruited from online platforms. The pilot study provided valuable insight into the study procedure. Based on the results of pilot interviews, the interview protocols in both interview phases were altered to improve clarity, readability, and conciseness. Data collected from the 6 participants were not included in the final analysis due to the exploratory nature of the pilot study.

The formal study followed the revised interview protocols (see Appendix II). The protocol for pre-trip interviews consisted of four parts. The first part was intended to gather an overview of tourists and their trips. Questions pertained to trip characteristics (e.g., *"Where are you from?", "How long are your whole trip and your visit to Hong Kong?", "Who are you going with during*

this trip?", What is your main purpose or motivation of this trip?"), travellers' characteristics (e.g., "*How many leisure trips do you normally take per year?", "Do you prefer independent tours or package tours?", "Do you prefer domestic travel or overseas travel?")*,* and travel planning-characteristics (e.g., *"How did you plan your trip?", "When did you start to plan your trip?", "How flexible is your plan?").*

The second part assessed tourists' goals for their day trips. Aspects included behavioural expectations (e.g., *"What are your overall expectations for today?"*) and behavioural intentions (e.g., *"What do you intend to do during the day?", "How many goals are you going to achieve today?"*). The third part focused on tourists' plans for their day trips. Questions referred to travellers' general plans (e.g., *"Do you have a plan for today?"*) and specific plans (e.g., *"Where do you plan to go? And when?", "What do you plan to do in each place?"*), the timing of advance plans (e.g., *"When did you make this plan?", "Why did you plan to go to/do this"*?), and the perceived flexibility of plans (e.g., *"Do you think that you will follow your plan?*").

The fourth part focused on smartphone use in daily life. Questions included *"How long have you been using a smartphone?", "What are the main functions you use in your daily life?", "How do you think using a smartphone changed your daily routine?", "How much do you rely on your smartphone?",* and *"If using a metaphor of a person, you would say a smartphone is…?"*

A series of open-ended questions were posed in post-trip interviews to provide useful information to achieve the three research objectives: 1) to investigate the contexts of decision making in motion during trips; 2) to identify tourists' information sources, information processing strategies, and heuristics for decision making in motion; and 3) to examine the roles of smartphones

under various decision circumstances (i.e., how smartphones could trigger, facilitate, or inhibit decision making in motion).

Table 4. 2 Post-trip Interview Protocol

Research Objectives	**Interview Questions for Tourists**
(1) To investigate the contexts of decision making in motion during trips.	Could you please describe the circumstance that you were under?
	Could you please try to recall the things in front of you at that moment?
	How did you feel at that moment physically and emotionally?
	Were there any unexpected restrictions? (e.g. time, weather, physical, budget, etc.)
(2) To identify the information sources, information processing strategies, or heuristics used by tourists in decision making in motion.	What was the thing that triggered you to consider the choice or search for more information?
	What was the information you used? Sources?
	Have you searched for additional information besides the one presented in front of you?
	Can you please recall how you selected this?
	Have you considered any alternatives? If yes, how did you think about them? (to identify attributes that were evaluated, and criteria applied)
	What was the opinion of other people in your group? Any discussion?
(3) To examine the roles of smartphones under each decision circumstance (i.e. the ways to trigger, facilitate, or inhibit decision making in motion).	Why did you turn to the smartphone at that time?
	What did you get from the smartphone?
	Did the smartphone help your decision making?

The formal study was conducted from May to August 2016. Thirteen hotel guests agreed to participate, and 17 tourists were recruited online ($N = 30$). Data collection ceased upon reaching saturation, at which point interviews revealed no new insights pertinent to the research questions. Gathered data were subsequently analysed. Participants were travelling with different group sizes,

different levels of flexibility, and different access to mobile technology. The profile of these participants is presented in Table 4.3.

Table 4. 3 Participant Profile

Participant ID	Gender	Country of Origin	Composition of Travel Party	Age Group	Length of the Day Trip (hours)	NO. of Scenario(s)
In1	M	China	2[d]	51-60	12	5
In2	F	China	1	18–30	11	4
In3	F	China	1	18–30	10	5
In4	F	China	3[h]	18–30	12	6
In5	F	China	1	18–30	8	4
In6	M	China	2[c]	18–30	9	6
In7	M	Taiwan	4[a]	51-60	12	5
In8	M	Australia	5[a]	41-50	10	3
In9	F	China	1	51-60	12	8
In10	F	China	2[h]	18–30	11	6
In11	M	UK	2[b]	31-40	10	3
In12	F	Australia	4[a]	41-50	12	4
In13	M	UK	5[a]	41-50	14	8
In14	F	Austria	2[c]	18–30	14	2
In15	M	New Zealand	4[a]	41-50	10	5
In16	F	China	1	18–30	14	8
In17	F	China	1	18–30	11	5
In18	F	China	2[e]	18–30	15	5
In19	F	China	3[f]	18–30	9	3
In20	F	China	3[c]	18–30	11	5
In21	F	Norway	2[g]	31-40	6	3
In22	F	Ireland	2[b]	31-40	8	2
In23	M	UK	1	41-50	11	4
In24	M	Sweden	2[b]	31-40	7	5
In25	F	Singapore	4[a]	41-50	7	6
In26	F	Switzerland	2[b]	31-40	11	8
In27	M	UK	2[b]	18–30	12	5
In28	M	France	2[b]	31-40	11	2
In29	M	China	1	31-40	11	10
In30	F	China	2[c]	18–30	12	5

[a] with spouse and children
[b] with spouse

[c] with friend(s)
[d] with colleague
[e] with mother
[f] with relatives
[g] with sister
[h] with online travel companion(s)

4.3 Data Analysis

The present study aims to develop "a unified vision of the essences of a phenomenon or experience" (Moustakas, 1994, p.59). Data analysis was intended to elucidate tourists' decision making in motion within a smartphone technological information context. Analysis began with data preparation and organisation.

4.3.1 Data Preparation and Organisation

For each traced day trip (30 in total), a data portfolio was established including audio records of pre- and post-trip interviews, videos of day trips from wearable cameras, audio records from tourists' think-aloud activities, tracking files exported from GPS data loggers, and written transcripts of audio records. The audio recordings that were in English were transcribed into English; the recordings that were in Chinese were transcribed into Chinese by the bilingual researcher. The GPS tracks of each participant's day trip were exported into Microsoft Word documents generated through Time Album software designed specifically for the GPS data logger device. Tourists' journey tracks could then be played back on Google Earth. Data analysis was performed early in data collection to capture potentially relevant information while guiding subsequent data collection. During interviews, the researcher took notes based on her observations and informal conversations with participants. At the end of each case, the researcher reviewed these notes and wrote memos. All data were prepared for analysis in the next stage. Nvivo 12, a qualitative data analysis software program, facilitated data organisation, preparation, and analysis.

Protocol analysis is an important method of eliciting and analysing verbal data relevant to consumer judgment and decision processes (Kuusela & Pallab, 2000). Analyses of corresponding verbalisations can allow for inferences of relevant information during cognitive processes (Ericsson & Simon, 1993). Harte et al. (1994) provided a framework for analysing verbal reports of decision-making processes. This framework was used to develop comprehensive process descriptions of decision making. In decision-making studies in which think-aloud protocols are collected, the purpose of data analysis is to reveal the presence or absence of certain components, sequences of cognitive processes, or reproduction of decision processes leading to decision outcomes. This process was essential in developing the coding paradigm in this study. Moreover, the segmentation level of verbal protocols (i.e., the main unit of analysis) ranged from the whole protocol to fragments and individual statements. Statements refer to meaningful components of utterances consisting of a group of words. This unit of analysis can yield complete descriptions of decision-making processes (Ericsson & Simon, 1993).

One focal area in this study was tourists' processing details about information search activities along with choice rules or heuristics. Retrospective protocols collected immediately after decisions could reflect short-term cognitive processing and provide insight into tourists' mental activities. In studies on decision making in which think-aloud protocols were collected (Bettman & Park, 1980a, b; Harte et al., 1994; Biggs, Rosman, & Sergenian, 1993; Biggs, Bedard, Gaber, & Linsmeier, 1985; Schkade & Payne, 1994), decision strategies were typically deduced by inspecting whole protocols. Consumers may not have complete rules or strategies in memory when making choices due to limited information processing capacity. Therefore, fragments or elements of heuristics are often assembled to construct heuristics during the choice process. These elements can include beliefs about alternatives, evaluation, rules of thumb, and rules for integrating

information (Bettman & Park, 1980b). The extent to which these elements are assembled, how they are used to generate choices, and the sequence in which they are applied when making choices may vary by situation. These processes are also contingent upon several task-specific factors (e.g., time pressure, incomplete information, salience, and format). As such, the elements of decision rules or heuristics for alternatives or brands may not be identical during a given task. Protocol data show that decision rules or heuristics are not always used systematically; rather, they may consist of a sequence of elements with a fragmented structure. Thus, the investigation of such elements, instead of coherent structures, may yield valuable insights into tourists' decision-making processes.

This study employed a detailed protocol analysis of elements of decision-making processes to analyse the decision-making microstructure. A large set of tourists' decision-making processes was analysed by focusing on information processing characteristics related to each type of decision task under specific contexts. Then, participants' retrospective protocols were transcribed and deconstructed into sequences of phrases or statements. Division of protocols into smaller units consisting of a single task-related statement allowed for a more detailed understanding of the decision-making process (Ericsson & Simon, 1993); however, this procedure was highly complex and involved a heavy workload. The length of each phrase depended on phrases' contents and relevance to the research questions.

4.3.2 Coding

Coding in qualitative research involves an interactive, inductive, deductive process that explores pieces of information in data. Researchers can then construct descriptions, themes, essences, and theories (Walker & Myrick, 2006). In the phenomenological inquiry, coding involves analysing specific statements and categorising them into clusters of meaning to describe

the phenomenon under investigation (Starks & Brown Trinidad, 2007). The purpose of this study is to understand what participants experienced (and how) during decision making in motion. This study followed the phenomenological data analysis. The process began with code development and concept identification followed by relationship identification (Moustakas, 1994). Data analysis was intended to identify pertinent concepts and the associations among them.

4.3.2.1 Phase 1: Code development and concept identification

The coding process started with code development and concept identification. Before coding began, the researcher read through all data to obtain an overall sense of meaning. This step was completed for each participant. When beginning the coding process, the researcher remained open-minded and followed the data closely to develop new insights by avoiding 'conceptual ruts' (Wicker, 1985) when interpreting the phenomenon of interest. Every related expression was listed and compared with others for similarities and differences. Phrases, sentences, or paragraphs describing similar incidents or experiences were grouped. Each group related to decision making in motion was treated as a code. The researcher followed Charmaz's (2006) guidelines for coding (i.e., codes should be short, simple, active, and analytic).

Next, codes were examined to identify concepts as well as their properties and dimensions. Codes were clustered by the concept and assigned conceptual labels based on either the literature (if the nature of meaning was consistent) or participants' descriptions. For example, the researcher noticed that several phrases, sentences, or paragraphs appeared to refer to consumption contexts under managerial control. The researcher labelled these contexts 'servicescape' according to previous literature (Bitner, 1992). Phrases, sentences, or paragraphs referring to incidents, interactions, and actions among tourists and their spatial, geographic locations in the destination

were labelled ‘geo-position’. These contextual dimensions could be further broken down into sub-concepts; for example, ‘geo-position’ was deconstructed into the distance between the participant’s location and a product, and the participant’s travel direction.

During prior steps, the researcher may have inadvertently grouped data into an irrelevant concept. To avoid this issue, the researcher further verified coded phrases, sentences, and paragraphs for two purposes: 1) to determine whether they were explicit expressions of corresponding codes and concepts; and 2) to determine whether their meanings were compatible with those codes and concepts. Identified concepts stimulated generative and comparative questions such as, *what defines ‘servicescape’? how does it differ from other kinds of contexts in which on-the-go tourists are immersed (e.g., social context)?* These questions guided the researcher’s subsequent examinations. These steps also enabled the researcher to identify potential errors. Data and nodes were eventually confirmed under appropriate classifications. Given the discrete, complex, and fragmented nature of data, the first coding phase included several cycles to develop codes and identify concepts. This iterative process maximised optimal fit and minimised bias from preconceived notions.

4.3.2.2 Phase 2: Relationship identification

The second phase involved exploring relationships among codes identified in Phase 1. Relationships were developed by examining each participant’s descriptions holistically. To facilitate relationship identification, the researcher focused on three aspects of participants’ descriptions of the focal phenomenon: 1) conditions or contexts; 2) strategies, actions, and interactions in response to what was happening; and 3) consequences or results of the action or inaction (Strauss & Corbin, 1990). As soon as the researcher noticed a decision was made while a

participant was in motion, data were scrutinised to identify the conditions leading to this decision, the context within which it was carried out, the action and interaction through which a decision was made, and its outcomes. During this analytic process, the researcher drew on literature relevant to the research questions, highlighting key elements. An example of relationship analysis is illustrated in Figure 4.6. Tourists were likely to actively search for decision-making information when they were dissatisfied with situations. Information processing involved evaluating alternatives based on certain criteria, ultimately leading to a final decision.

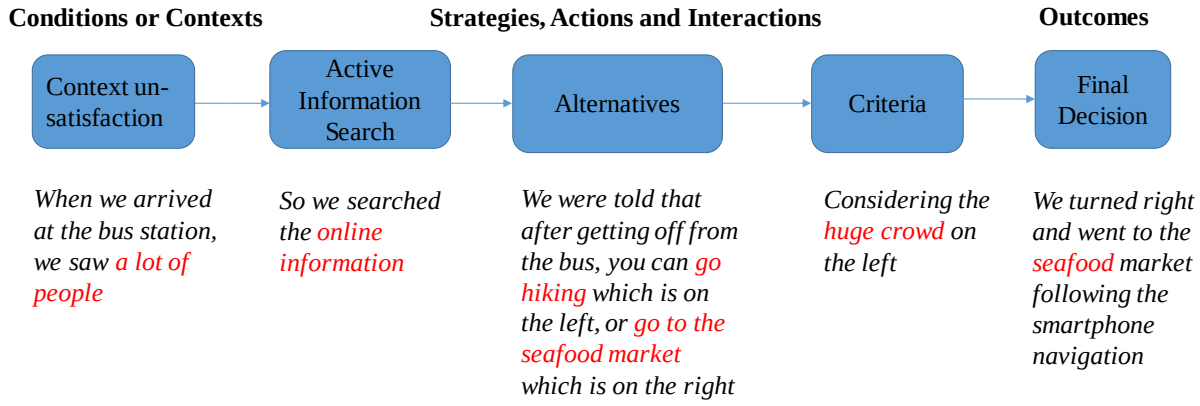


Figure 4. 6 Example of Relationship Analysis

In Phase 2, steps similar to the first phase were applied to systematically gather and organise data into full descriptions. This process integrated and revealed the structure and process of tourists' decision making in motion. Each participant's 'story' was examined for repeated themes. Such themes were then analysed to identify the reasons for repetition. Finally, relationships were considered provisional and thus checked to ensure compatibility with the coded data and relationships.

These two phases led to the establishment of the coding frame to answer research questions and reflect on the literature (Tables 4.4 and 4.5). The coding frame included two main sets. The first set was related to on-the-go tourists' contexts during decision making in motion, including seven categories: servicescape, social, information, intrapersonal, geo-position, time, and weather. The second set encompassed tourists' information processing during decision making in motion via three categories: decision tasks, information sources, and decision criteria. This coding frame captured contexts of decision making in motion and decision makers' processing of information cues generated from different sources (e.g., on-site signage, social input, and online information from smartphones).

Table 4. 4 Context of Decision Making in Motion—Coding Frame

Category	Code name	Definition of code	No. of Scenarios
1.1 Servicescape dimension	1.1.1 Spatial layout and functionality	Spatial layout of equipment and furnishing as well as the functionality of them to facilitate service exchange within consumption settings, such as view, size, setting, and organization of shelf, etc.	16
	1.1.2 Pricing and promotion	Cost of a desired product or service, and promotional activities by companies such as discounts, sales, and complimentary gifts, etc.	16
	1.1.3 Signage	Explicit or implicit signals presenting and communicating to customers.	19
	1.1.4 Other consumers	Perception of other consumers within a consumption setting.	18
	1.1.5 Ambiance	Visual, olfactory, tactile, and auditory elements of human senses.	10
1.2 Information dimension	1.2.1 Online	Information collected through the mobile Internet using a smartphone.	46
	1.2.2 Offline	Information collected from offline channels such as staff, map, printed source, information board, people nearby, etc.	42
1.3 Social dimension	1.3.1 Travel companion	The number of people, the composition of the travel group, their characteristics, the presence of children accompanied, and family role.	37
	1.3.2 Friends and relatives	Friends and relatives who are not members of the travel party.	19

1.4 Intrapersonal dimension	1.4.1 Prior knowledge and experience	Information, understanding, and skills, and/or decisions or experiences in relation to the destination, a product or service before travel.	46
	1.4.2 Physiology	Biological or physiological aspects of an individual with respect to physical conditions.	33
	1.4.3 Psychology	Psychological aspects of an individual regarding personal traits, goals or motives, needs, preferences, and habits.	32
1.5 Geo-position dimension	1.5.1 Travel direction	The direction of a tourist's movement toward a desired place or activity.	50
	1.5.2 Distance between location and service	Spatial distance between a tourist's location and a desired place or activity.	41
1.6 Time dimension	1.6.1 Time budget	Time available to a tourist and a plan of how it will be spent.	20
	1.6.2 Downtime	The time that is not filled up by any planned activity.	12
1.7 Weather dimension	1.7.1 Temporal weather	Current weather of immediate physical surroundings.	19

Definitions for categories:

1.1 Servicescape dimension: Objective, physical conditions that are under managerial control within a certain consumption context (Bitner, 1992).

1.2 Information dimension: Information sources, channels, and technological platforms used for travel-related purposes during the trip.

1.3 Social dimension: Social, interpersonal aspects within one's social networking regarding the number of other players, others' experience or expertise, others' similarity to self, communication process, etc.

1.4 Intrapersonal dimension: Individual internal aspects.

1.5 Geo-position dimension: Tourists' current spatial location in the destination.

1.6 Time dimension: A moment or a period during which an action, activity, process, or condition exists or takes place.

1.7 Weather dimension: Weather conditions in the destination.

Table 4. 5 Tourists' Information Processing during Decision Making in Motion — Coding Frame

Category	Code name	Definition of code	No. of Scenarios
2.1 Decision task	2.1.1 Attraction & Place	To decide which tourism attractions or places to visit	40
	2.1.2 Food & Restaurant	To decide what and where to eat or drink.	60
	2.1.3 Shopping &Purchase	To decide where and what to make a purchase	33
	2.1.4 Route & Transportation	To decide the route and transportation modes used to reach a place	17
2.2 Information source	2.2.1 Smartphone	Online information gathered through the mobile Internet	49
	2.2.2 Staff	Information gathered from staff	14
	2.2.3 Travel companion	Information gathered from a travel companion	18
	2.2.4 Friend or relative	Information gathered from friend or relative	7
	2.2.5 Memory	Accessing and retrieving the contents of memory	26
	2.2.6 Pass-by option	Items the tourist moves past or through such as stores, restaurants, and leisure activities.	16
	2.2.7 Nearby people	Information gathered from nearby people such as peers, and local residents.	10
	2.2.8 Road sign	Information gathered from the road sign	9
	2.2.9 Guidebook	Information gathered from the travel guidebook	5
	2.2.10 Map	Information gathered from the printed map	9
	2.2.11 Menu	Information gathered from the restaurant menu	5
2.3 Decision criteria	2.3.1 Personal interest	Individual's affective responses (i.e. positive/negative feelings) to the alternative being evaluated	29
	2.3.2 Location	Geographic location of the alternative being evaluated	56
	2.3.3 Other consumer	Influence from other consumers in the consumption setting	8
	2.3.4 Feature	Certain features of the servicescape such as ambiance, size	14
	2.3.5 Prior knowledge	Prior knowledge or use experience regarding the alternative being evaluated	55
	2.3.6 Physical strength	Individual's measure of one's physical resource	8
	2.3.7 Time budget	Individual's perception of one's time resource	25
	2.3.8 Price	Individual's perception of Cost of the alternative being evaluated	15
	2.3.9 Online review	Opinions from other consumers who have used the alternative being evaluated	3
	2.3.10 Recommendation	Recommendations from friends or travel companions	9
	2.3.11 Social density	The number of people and interpersonal distance within a consumption setting which are potential sources affecting judgmental or affective responses (Wohlwill, 1974).	6

2.3.12 Social input	Constraints for the tourist because of other individuals (e.g., family members, travel companions)	2
2.3.13 Weather	Influence from the external environment	5
2.3.14 Convenience/Ease of use	The degree to which an individual believes that using a service would be free of effort (Davis 1989)	3

Definitions for categories:
2.1 Decision task: Decisions to be made regarding obtaining and consuming different types of tourism products and services.
2.2 Information source: Use of mixed sets of channels for the activities aiming at gathering information about travel-related services during trips.
2.3 Decision criteria: Generating psychophysical and value judgments or attitude toward each alternative based on salient cues and easily accessible information/ heuristics (Samson & Voyer, 2012).

4.4 Establishing Trustworthiness: Criteria and Techniques

Common criticisms of qualitative research include subjective interpretation and description, potential researcher bias, and lack of scientific rigor and generalisability (Cope, 2014). To establish trustworthiness in qualitative research, the researcher followed principles from Lincoln and Guba (1985): credibility, transferability, dependability, and confirmability. Various strategies were woven into every step of inquiry to attain these criteria. These assurances incrementally and interactively contributed to the trustworthiness of the research. Credibility relates to the truth of data and the researcher's skills in interpreting them. Credibility in this study was enhanced through prolonged engagement, namely by allowing adequate time for data collection and developing rapport and trust with participants. This process contributed to a thorough understanding of the people and the phenomenon under study. Specific techniques were used to minimise unintended bias and inaccurate recall due to memory failure. Participants' on-site activities and decision-making processes were digitally tracked and videotaped, and interviews were recorded. In qualitative research, a key strategy to enhance credibility is an audit trail (Ryan-Nicholls & Will, 2009). The researcher collected materials and documents used in the research process (e.g.,

interview transcripts, notes, and memos from data collection and analysis). These materials documented every aspect of the researcher's assumptions, decisions, and conclusions.

In addition, the researcher applied corresponding strategies for triangulation and inter-coder reliability during data analysis. The consistency of information and the overall trustworthiness of findings were enhanced by having two coders independently interpret the same protocols to ascertain inter-judge reliability. Triangulation is valuable in strengthening qualitative research; in this process, multiple independent information sources are used from different hierarchies to test one source of findings against another and scrutinise alternative explanations (Mehmetoglu & Altinay, 2006). Different forms of evidence gathered through multiple data collection methods provided rich information about the chosen phenomenon and offered opportunities for data triangulation. Study findings were derived through triangulation of the four sources (i.e., pre- and post-trip interviews, videos of day trips from wearable cameras, track files exported from GPS data loggers, and memos) to minimise subjectivity and maximise trustworthiness. One issue with the validity of verbal protocol data involves the content of information processes, which may be difficult to verbalise considering visual information (Harte et al., 1994). In this study, day-trip videos provided visual information relevant to participants' unplanned behaviour processes and enabled alternative validity checks of participants' verbal reports.

Transferability refers to whether study results are applicable to other settings or groups (Phillimore & Goodson, 2004). In qualitative research, this criterion can be satisfied if individuals who did not participate in a study can understand the study results and related them to their own experiences (Cope, 2014). To legitimise the transferability of inquiry, sufficient information about the research context, procedures, and participants have been provided in this thesis. Such

information enables the research community and other readers to assess whether the findings are transferable. Dependability refers to the extent to which the research findings can be replicated with similar participants under similar conditions (Koch, 2006). In this study, dependability was established by involving an experienced mentor in each stage of the research process to confirm the researcher's decisions.

Confirmability captures the extent to which data represent participants' views rather than the researcher's subjective biases (Cope, 2014). To ensure confirmability, the data collection and analysis protocols, in addition to detailed coding frames, are presented in this chapter. Findings are illustrated in Chapter 5 using detailed participant quotations, indicating that study results were directly derived from the data. Emerging categories were defined by their respective properties. Results were also compared with those in the literature. Member checking was used to verify data accuracy; participants were invited to review a summary of the study's main findings and offer commentary.

Reflexivity plays a central role in qualitative inquiry. It helps avoid researcher bias, ensures study rigor, and thus enhances the trustworthiness of the research. Rather than attempting to control the researcher's values, this approach aims to consciously acknowledge his/her values, background, and experience with the phenomenon. These features may influence the researcher's choices, consequently shaping research outcomes (Ortlipp, 2008). In this study, the researcher engaged in critical self-reflection to ponder implied meanings from the data. The researcher also maintained a reflexive journal to record her thoughts, feelings, and reflections about the data to ensure the accuracy and trustworthiness of interpretations.

4.5 Summary of the Chapter

This chapter introduces the methodology, based on the purpose and nature of this study and literature review, applied in this study. According to Guba and Lincoln (1994)'s inquiry paradigms, the post-positivism paradigm post-positivism paradigm is appropriate for this study to guide its design and methodology. This paradigm supports the theoretical foundation of this study: tourists' decision making is an adaptive process largely based on subjective perceptions or evaluative judgments constructed from contextual 'facts'. Considering the complexity of human behaviour and experience, a qualitative research design was adopted which can provide an in-depth picture of tourists' decision making in motion by obtaining detailed, rich information. Moreover, phenomenology is useful for studying tourists' decision making in motion because this approach can yield new insights along with a clearer understanding of uniquely complex processes.

Following a phenomenological approach, this study employed process tracing and in-depth interview methods. The study procedures are described in two sections: data collection and data analysis. The data collection section firstly introduces the selection criteria for study participants and the process to recruit participants. Then, the section describes the materials and procedures to collect data and to develop interview protocols. Data analysis began with data preparation and organisation. The two-stage coding process began with code development and concept identification followed by relationship identification (Moustakas, 1994). Data analysis was intended to identify pertinent concepts and the associations among them. To establish trustworthiness in this research, the researcher followed principles from Lincoln and Guba (1985): credibility, transferability, dependability, and confirmability. Various techniques, such as triangulation, inter-coder reliability, and member checking were applied during data analysis.

Detailed findings emerging from the implementation of the described methods are presented in the next chapter.

CHAPTER 5: FINDINGS

This chapter presents the study results based on triangulated data analysis and the research questions. Findings delineate the process of tourists' decision making in motion. First, the multi-dimensional context of decision making in motion is described. Second, tourists' information processing patterns and strategies for choosing information sources and decision criteria are explored. These results elucidate decision making in motion. Finally, the roles of smartphones in the decision-making process are analysed.

5.1 Context of Decision Making in Motion

When analysing 30 participants' day trips, 150 scenarios involving decision making in motion were observed. Analyses revealed that decision making in motion was related to four types of tourism products and services: attractions and places (40 scenarios), food and restaurants (60 scenarios), shopping and purchases (33 scenarios), and routes and transportation (17 scenarios). These scenarios uncovered contexts in which participants were immersed while moving within the destination. Participants reported seven dimensions in which spontaneous decisions emerged: the servicescape; information; social; intrapersonal; geo-position; time; and weather dimensions (Figure 5.1). The subsequent sections describe these dimensions and how they influenced decision making in motion.

5.1.1 Servicescape Dimension

Participants encountered objective, physical, and social conditions under managerial control during their trips. These situations fell under the 'servicescape' dimension of context (Bitner, 1992). This dimension consists of five components: 1) spatial layout and functionality; 2)

ambiance; 3) signage; 4) other consumers; and 5) pricing and promotions. These factors exerted either direct or indirect influences on tourists' cognitions and resulting decisions.

5.1.1.1 Spatial Layout and Functionality

When participants described the contexts of decision making in motion, they often mentioned the size, scale, and setting of the spatial layout. They also cited business functionalities, such as hours of operation. This component was most noticeable in tourists' decision making in motion for food and restaurants (DM10, DM24, DM39, DM81, DM112, DM124, DM129, DM136, DM160, DM163, DM165, DM166, DM185). Decisions related to shopping and purchases (DM8, DM52) and attractions and places (DM69) were also influenced by these features.

Participant #23 described the process of selecting a restaurant among several options on the basis of restaurants' spatial layouts.

"I was just walking around a nice place. In a street. There were quite…not lots of, some [restaurants]. They were all mainly Western. Wine bars, bars, restaurants…Then I saw one I liked. [It was] completely random. [It was] an ***open*** *restaurant. So he [the staff]is standing in the front. So they are* ***inviting****." (DM136)*

5.1.1.2 Ambiance

The ambiance of tourism services and products entails visual, olfactory, tactile, and auditory elements of human senses (Bitner, 1992). Participants often mentioned this dimension of the servicescape when making food- and restaurant-related decisions in motion (DM53, DM72, DM77, DM86, DM129, DM132, DM141, DM154, DM166, DM177).

Participant #12 explained how the ambiance of a bar captured her attention when she was strolling on the street.

"[We] walked along the lane way, and there were lots of pubs and bars. And then we saw that one. Gallery with [a] bar… It just looked interesting. ***Good music. Very modern décor. Funky people****… I think we all just walked there. I said, 'That was fun.'" (DM72)*

Participant #21 reported seeing a coffee shop while walking around a shopping centre. She described its ambiance thusly:

"*We saw a coffee shop. We were not familiar with the brand. Because it was a really small shop. Just like a* ***calm area.*** *Not very big. It was nice to just sit and relax. Later, we remembered, we just came back to the same place." (DM132)*

5.1.1.3 Signage

Participants noted signage during decision-making processes for food and restaurants (DM16, DM31, DM37, DM42, DM86, DM101, DM121, DM141, DM154, DM163, DM181, DM185, DM192), shopping and purchases (DM1, DM68, DM125, DM176, DM188), and routes and transportation (DM147).

Participant #15 mentioned a restaurant's menu as an important dimension of the context in which decisions emerged.

"I mean, people were on the street, the ***menu*** *tries to get you to go in. So we had a look at the* ***menu*** *and yeah, we [went] there." (DM86)*

5.1.1.4 Other Consumers

Some participants mentioned their perceptions of other consumers. Participants specifically cited the identities and number of other customers in various consumption contexts. These characteristics could influence participants' decisions related to attractions and places (DM19, DM138, DM152), food and restaurants (DM3, DM21, DM27, DM37, DM38, DM42, DM72, DM75, DM121, DM136, DM154), shopping and purchases (DM8, DM92), and routes and transportation (DM180, DM182).

Participants #13 and #25 discussed the number of other consumers in servicescapes while making decisions in motion.

"Everyone wants you to come in to have a drink in their shop. 'Come have a drink in our shop! Come have a drink in our shop!' … We saw a place [where] ***there were quite a few people there already****. They [wouldn't] come out and try to get us in there. So we thought it must be popular. They don't need to pull people in." (DM75)*

"Very ***long queue*** *and very hot. My husband asked the [person] in front how long the waiting time [was]. One and a half hours. We both said 'OK, let's forget about it.'" (DM152)*

5.1.1.5 Pricing and Promotions

Participants also mentioned pricing and promotion elements (e.g., discounts and special offers) in the servicescape when describing decision making in motion. These elements were noticed in 7 shopping- and purchase-related decisions (DM15, DM18, DM60, DM61, DM68, DM184, DM188), 5 food- and restaurant-related decisions (DM16, DM23, DM31, DM145,

DM150, DM154), 3 route- and transportation-related decisions (DM84, DM115, DM180), and 1 attraction- and place-related decisions (DM29).

Participant #15 suggested that prices and promotions were important elements in decisions about transportation.

"We saw the Big Bus Tour. We thought about it. And we saw ***the price was quite expensive*** *for four. But then we worked out some other pieces in it… There was a* ***family discount.*** *[It also included] the tram ticket. We [could] have 24 hours* ***for free****." (DM84)*

5.1.2 Information Dimension

On-the-go tourists used information in the destination to address spontaneous needs. Travellers often referred to information sources for navigation (i.e., wayfinding) (e.g. Participants #11, #17, #25), and itinerary management such as identifying things to do) (e.g. Participants #12, #15, #16), collecting or reinforcing travel ideas (e.g. Participants #13, #18, #26), checking weather (Participant #21), and looking up deals (e.g. Participants #23, #26, #29). Multiple complementary information sources, channels, and technological platforms were used to gather information about tourism products and services to add items to itineraries. The information space around tourists, both online and offline, comprised a major contextual dimension for decision making in motion.

5.1.2.1 Online Information

On-the-go tourists often took advantage of the accessibility and convenience of online information via smartphones when handling emergent decision tasks about tourism products. Innovative smartphone apps with context-aware functions were often used to search for nearby

food and restaurants and to find directions (DM10, DM24, DM55, DM57, DM93, DM104, DM105, DM112, DM116, DM121, DM154, DM160, DM165, DM166, DM192).

Participant #18 described searching for nearby restaurants and selecting one from a list of alternatives based on online information.

"*I searched for dining options on the **Dianping app** [a popular review site in China] but found that [some options] were not really **close to us**. I did [not] want to spend long looking for them. I looked around and found a restaurant that looked relatively big. Then I searched [for] it on the **Dianping [app]** and the rating was okay. So I went in." (DM112)*

5.1.2.2 Offline Information

Participants also used offline information from staff (e.g. Participants #1, #3, #11), peers (e.g. Participants #5, #13, #29), and local residents (e.g. Participants #6, #25, #28) to make decisions. They referred to printed sources such as maps (e.g. Participants #5, #23, #24), magazines (e.g. Participants #27), guidebooks (e.g. Participants #13, #25), and brochures (e.g. Participant #15) as well. On-the-go tourists most often used these sources to make attraction- and place-related decisions (DM4, DM22, DM29, DM30, DM69, DM76, DM78, DM79, DM138, DM146, DM149, DM151, DM152, DM169, DM178).

Participant #13 described the information dimension of the context in which he was immersed while making attraction- and place-related decisions in motion. His emergent decision was influenced by offline information from peers.

"*We talked about it... And we spoke to **somebody on the bus** as well. They were Chinese people who were visiting... We just asked them because they [spoke] a mixture of English... And*

they said, 'Where are you going to go?' We said Peak. They said 'Well, if you wait until tomorrow, the weather will be better. You won't see anything up there today.' So we changed our mind. We [went] back to Central." *(DM76)*

Tourists also used printed information sources such as maps and guidebooks (e.g. Participants #13, #23, #25). Participant #25 mentioned obtaining information from a guidebook when making attraction- and place-related decisions in motion.

"So we discussed where do we want to go. Then we continued our walk. We said that we wanted to go to this area. Here in this area, Hollywood Road. So we walked along from here, all the way along here. Because we read in the ***guidebook*** *that this is a nice area… Just like my husband had an idea 'Let's go here', and I said, 'Look, I have read something nice about this.'…I said, 'We are nearer to Sheung Wan. So why don't we just walk over?' And we said, 'Yeah, OK, we'll walk over, and we'll take the MTR here.' Fine, that's the decision. Very fast." (DM153)*

5.1.3 Social Dimension

Participants reported facing social and interpersonal aspects during decision making in motion. These aspects refer to the social dimension of decision-making contexts, which can be classified into two categories depending on whether other players were members of the travel party.

5.1.3.1 Travel Companions

The first social factor was related to other members in the travel group (i.e., travel companions) along with travel party size, others' experience or expertise, others' similarity to oneself, and the communication process. Participants who travelled in groups reported being heavily influenced by travel companions (e.g., children, parents, spouses, relatives, and friends)

for decision making in motion. Companions were particularly vocal about decisions regarding food and restaurants (DM24, DM27, DM33, DM37, DM43, DM45, DM48, DM62, DM64, DM75, DM77, DM81, DM86, DM112, DM114, DM150, DM154, DM155, DM157, DM165) and attractions and places (DM5, DM19, DM34, DM71, DM85, DM94, DM113, DM159, DM192).

Participants #13 and #16 each mentioned conflicting interests within the travel party arising from the social dimension of decision-making contexts:

"We were looking for somewhere to eat. We saw a couple of restaurants. ***Some of our children said, 'We want to go there and there,' my wife said, 'Why don't we go there?'*** *…We spent about 20 minutes [with] people saying, 'I don't like this, I don't like that.'*" *(DM81)*

"After we finished our dinner, ***she told me that she wanted to go back and was not going to the Peak****. She said that she was a bit tired, so she wanted to go to bed. I was actually disappointed when I heard that. I wanted to go to the Peak. I think that there was still a lot of time and I could [have seen] the night view on the Peak.*" *(DM94)*

Participant #25 reported accommodating travel companions' needs in food- and restaurant-related decisions.

"My husband said let's go to the other area he really wanted to go... He wanted to go to a particular coffee shop that moved from Tokyo to there. He has been to the Tokyo coffee shop, and he really wanted to go to see the coffee shop there." *(DM157)*

Moreover, Participants #15 and #10 explained that they utilised their travel companions' expertise to make decisions about attraction and places and food and restaurants, respectively.

"One of the sons heard from some friends [that] Stanley market was quite good… maybe a friend in New Zealand who has been to Hong Kong…we rarely heard about it." (DM85)

"*I asked for my companion's opinion about the two restaurants I searched before the trip, and she thought they were not good. Since she had been here twice, I [believed] that she could take me to have something tastier*." *(DM62)*

5.1.3.2 Friends and Relatives

The other social dimension was related to participants' social networks outside the travel party, including friends and relatives. Smartphones and mobile Internet enable ubiquitous social interaction during trips. Therefore, many participants mentioned they communicated with distant social circles via online chats (e.g. Participants #3, #18, #20, #30), social media (e.g. Participants #16 and #29), and video calls (e.g. Participants #17). On-the-go tourists were likely to collect information or ideas from local and distant social networks to make travel-related decisions.

Two participants noted that they trusted their friends' opinions. Friends' input thus had large effects on tourists' food- and restaurant-related decisions.

*"We asked **our friend** to show us some authentic Hong Kong food we had not had before. And dim sum was suggested. Local people's suggestions are **much more helpful**. If you can [get them, but they are] not always available. I think if you trust that local person, yes. Otherwise, I wouldn't ask strangers. Maybe [I] would not be [very] trusting." (Participant #27, DM171)*

"*When I was on the Peak, I had no idea about the lunch… I saw the Tsui Wah restaurant, which [had been] recommended by a friend yesterday. Then I posted it on **WeChat**. I have several **colleagues** who are foodies and we have a WeChat Group. I said the Tsui Wah Restaurant seems*

to be famous here. They all said that they also ate there when they came to Hong Kong. Two of them who often travel to Hong Kong said that they had eaten in that restaurant and it was good." *(Participant #29, DM181)*

5.1.4 Intrapersonal Dimension

During decision making in motion, many participants mentioned the internal features of their contexts. This dimension was labelled the intrapersonal dimension and included three elements: 1) previous knowledge and experience, 2) physiology, and 3) psychology.

5.1.4.1 Previous Knowledge and Experience

Previous knowledge and experience played essential roles in participants' decision making in motion in relation to the four types of tourism products (mentioned by 28 participants). For example, Participant #15 reported that when he saw a place or product, he recalled past travel experiences during a transportation-related decision.

"***We have done those [activities] in other cities****. When we [have] been to other places, like a hop-on hop-off bus, and it's the same thing as this. That's why we decided to do this because we have done that before in other cities." (DM84)*

Similarly, Participant #26 described how a shopping decision was inspired by her previous knowledge about the brand and prior usage experience with the product.

"*We were in the bar, we wanted to see what kind of shops they had in the mall. So we checked the website. We saw they have a Muji store... **I knew this store** from London when I used to go to London during my high school years... **I used to buy planners from Muji all the time**. I*

purchased [one] two years ago…. And I didn't find it anywhere in Switzerland. So I was thinking [about buying] it from the Internet. Since we saw there was a Muji, I decided I would take this one." (DM164)

5.1.4.2 Physiology

Participants also mentioned physiological and physical states such as hunger (e.g. Participants #11, #17, #21), fatigue (e.g. Participants #15, #16, #22), and illness (e.g. Participants #23, #24). This contextual dimension had a powerful influence on the participants' internal processes. Physiological features led to immediate, unplanned decision making, especially about food and restaurants (DM10, DM16, DM23, DM27, DM31, DM33, DM37, DM39, DM56, DM67, DM93, DM99, DM105, DM114, DM121, DM124, DM127, DM129, DM141, DM145, DM150, DM154, DM155, DM160, DM177).

Participant #21 decided to visit a sushi restaurant under an overwhelming physiological context.

*"It was a big shopping centre. We were **so hungry**; we knew that we [couldn't] think before we [had] food. We went straight downstairs to this sushi place. So we had food and we went shopping." (DM129)*

5.1.4.3 Psychology

The third component of the intrapersonal dimension concerned participants' psychological states including affect, personal traits, and interests. When asked why they had decided to make an unplanned visit to the history museum, Participant #13 reported interest.

"*We were **interested** in the history of Hong Kong. We've seen a little bit of it, we thought about how this happened, why Hong Kong is what it is today.*" *(DM78)*

Another typical example emerged from Participant #18, who made many purchase decisions throughout the day. Personal interest in shopping (i.e., being a shopaholic) affected those purchase decisions.

"*I really **like buying things**, I am even much more self-controlled than before." (DM109)*

5.1.5 Geo-Position Dimension

The fifth contextual dimension of decision making in motion was associated with tourists' spatial and geographic position in the destination, labelled the geo-position dimension. Participants discussed their choices about the four types of tourism products. Relevant decisions were influenced by participants' travel directions. Choices also relied on the distance between participants' current locations and desired service.

5.1.5.1 Travel Direction

Participants decided where to go and what to do based on a sense of direction and orientation. Judgments of spatial connections were also important (i.e., tourists' own relations and positions and the positions of objects relative to others).

Participant #29 explained the process of making an attraction-related decision among three alternative options: the Peak and two museums. His final choice was based on travel direction.

"I searched the locations of the history museum and art museum while on the go. I went to the Kowloon park and the coffee shop in the morning, which were very close to the subway station.

However, the two museums were relatively far from the station and they were in the ***opposite direction****. If I [went] to the museums, I [would need to] walk back to the station after that." (DM178)*

Adding pass-by items (e.g., stores, restaurants, and leisure activities) to the travel itinerary was a common practice among on-the-go participants. Participant #25 explained that his decision to take a mid-level escalator was mainly determined by travel direction.

"*We were just there. We were* ***passing it by****. I thought, 'Why don't we take one of the escalators up?', still thinking it would go to Hollywood Road. Then I thought we could walk the rest and go around. But then somehow we just continued moving up there, the escalator, because it was so interesting to see." (DM156)*

5.1.5.2 Distance Between Locations and Services

In addition, participants reported that their decision-making processes were largely influenced by the distance between their locations and the desired place or activity. They were likely to choose service options near their current locations. For example, Participant #26 described deciding to go to another bar in the same building rather than travelling elsewhere.

"We checked if there's any other restaurants or bars ***inside of the tower*** *where we would have a [nice] drink, you know… we didn't want to move from the tower.* ***We didn't want to spend time in a taxi or going to another place****…We found [it] on the official website, the Ritz Carlton. We found their choice of dining and restaurants and bars. We saw they [had] another bar on the 103rd floor." (DM165)*

In comparison, some participants decided not to visit attractions due to the long distance (Participant #24) or inconvenient transportation (Participant #1). Participant #24 intended to go to the Heritage Museum but ultimately decided not to because it was far from the hotel.

"*I think because we asked [if] it wa**s far away**; it was almost 30 minutes. We were thinking if we do that, then that's all we can do for the day. We get there, we spend 3–4 hours there. And we come back, we have to get ready to go. Whereas if we did this, we [would] get to see a bit more. We [would] get to walk a bit more. I think that's what changed our mind*." *(DM146)*

5.1.6 Time Dimension

Participants could identify specific moments or periods during which decision making occurred. The time dimension of decision making in motion context tended to involve a time budget and downtime.

5.1.6.1 Time Budget

During trips, participants' decision making was closely tied to time resources (i.e., time budget), specifically the amount of time available, the time of day, time allocation, and biological clock. Participants' decisions about food and restaurants (DM3, DM33, DM39, DM40, DM44, DM45, DM55, DM67, DM81, DM105, DM181) and attractions and places (DM4, DM11, DM30, DM85, DM146, DM159, DM175, DM178) were largely influenced by tourists' time budget.

Participants identified two aspects of their time budget: objective time and psychological time. Objective time was unaffected by participants' interpretations (i.e., time in units ranging from the time of day to month or season) (Belk, 1975). The psychological time involved participants' perceptions of relative time (i.e., presence or absence) for travel activities. Objective time was

associated with participants' biological clocks and restaurants' operating hours; thus, this form of time greatly affected travellers' food- and restaurant-related decision making.

"*Actually we wanted to have dinner in Mong Kok [and] just have dessert in Sai Kung. But it was* ***already 6 o'clock****. So [we figured,] let's have dinner here*." *(Participant #14, DM82)*

Psychological time determined how much time participants had to take part in an activity. Some participants mentioned time pressure while making decisions in motion. For example, Participant #1 implied a sense of time stress when deciding where to have lunch.

"*We did not have much time [to search] for additional information. We saw many people in the restaurant. It was fully packed. Then we went in…Just made a quick decision since* ***we did not have much time****." (DM3)*

5.1.6.2 Downtime

Participants reported having downtime (i.e., a period of time unoccupied by activity) when waiting for others (Participants #16, #17), waiting for a table in a restaurant (Participants #12, #22), waiting for the ferry (Participants #19), resting (Participants #13, #6), or simply not having plans (Participants #1, #4, # 24) or having plans fall through (Participant #12). To fill downtime, some participants went shopping (Participants #16, #17, #22) or looked for things to do or places to visit (Participants #1, #12). Others used their smartphones for entertainment and/or information searching (Participants #6, #19). Consequently, many spontaneous decisions emerged during downtime. For example, Participant #22 reported making shopping decisions.

"Once we knew where the restaurant was, we went up to [it]. They didn't have a table ready for half an hour. So we put our name down for 2:15. And ***we walked around the mall for***

***half an hour**. And we bought a present for my cousin's son. We bought some wine for them as well."*

Participant #22 added that *"We knew we wanted to buy them something, we just didn't know what. But we saw there was a wine shop, and there was a children's clothes shop. So it was perfect."*

Participant #24 decided to get a massage during three hours of downtime.

*"I think it was something that we had talked [about] a little bit. And worked out the chance we had. So it wasn't [like] I suddenly made the huge decision I want a massage. **It was more, 'OK, we have three hours, let's try and see if we can get a massage**.'" (DM151)*

5.1.7 Weather Dimension

Temporal weather conditions in tourists' immediate surroundings constituted the seventh contextual dimension of decision making in motion. Fourteen participants discussed decision making under various weather conditions. While travelling, tourists made choices on the basis of rain, heat, clouds, sunsets, typhoons, and storms.

For example, Participant #8 reported having originally planned to visit the Buddha and Monastery. After checking the weather forecast in the morning, the participant decided to take their children to museums. Museums had been "*one of the options, in case the weather was bad*", and the anticipated heavy rain influenced their choice.

Participant #7 discussed making food- and restaurant-related decisions in the case of sudden rain.

"*We wanted to go to a tea house located in Sheung Wan. However, when we arrived at the tube station, it was* ***raining****. So we decided to give up because there [was] some distance between the tea house and the station. We [would] need to walk for a while to get there.*" *(DM44)*

Participant #26 encountered a severe storm and subsequently cancelled a science museum visit.

"I think we left the hotel around 1:00. Because there was ***a big storm****. We waited for the storm to end… Also, the idea was to go walking to the science museum. So to walk around before going to the museum. [Because] the weather [would] not permit a pleasant walk, we decided to cancel the science museum and travel by taxi only. Not try to go somewhere and go to another place. And just be relaxed and go to lunch. And just walk around in the mall." (DM159)*

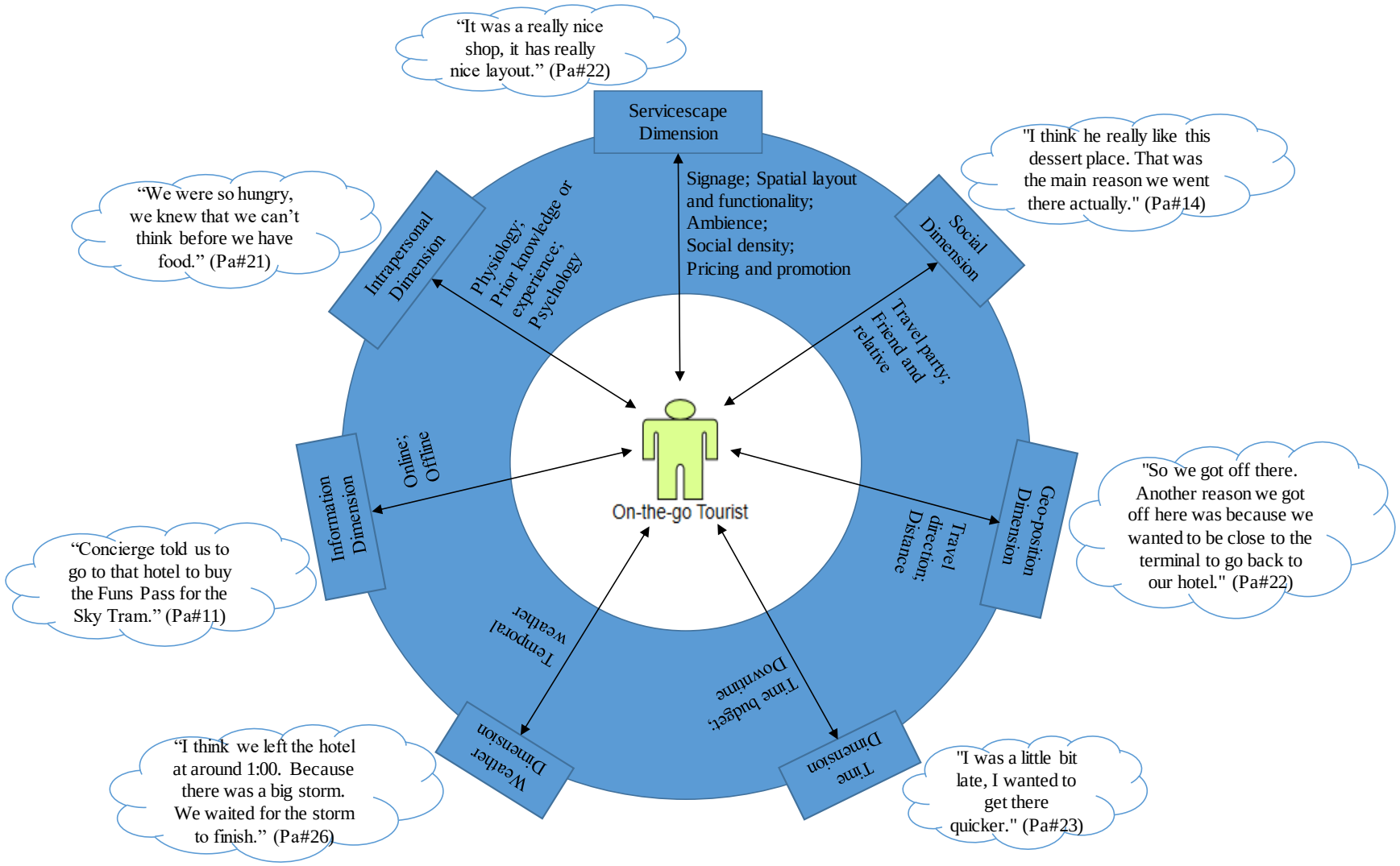


Figure 5. 1 Context of Decision Making in Motion

5.2 Tourists' Information Sources, Information Processing Strategies, or Heuristics During Decision Making in Motion

Data analysis revealed that participants' decision making in motion was largely influenced by the information cues they noticed. Decisions were shaped by how participants collected, organised, and evaluated information. On-the-go participants applied three information processing patterns and strategies during decision making. These approaches affected how tourists processed information and which decision criteria they used. The patterns varied by tourism product category as discussed in the following sections.

5.2.1 Pattern 1: Context-triggered Active Information Search

The first information processing pattern constituted an active mode of searching, collecting, and processing information during decision making in motion. Results indicated that, when triggered by certain contexts, tourists would actively search for information from numerous sources to inform decisions. This pattern manifested in 76 decision-making scenarios across the four categories of tourism products and services. The pattern was most noticeable in food- and restaurant-related decisions (38 scenarios), followed by shopping- and purchase-related decisions (18 scenarios), route- and transportation-related decisions (12 scenarios), and attraction- and place-related decisions (8 scenarios) (Table 5.1).

Table 5. 1 Pattern 1: Context-triggered Active Information Search

Type of tourism products	Contextual antecedents	Information sources	Decision criteria
Attraction & Place (8)	Downtime (4) Plan failure (3) Context dissatisfaction (1)	Smartphone (3) Staff (2) Guidebook (2) Travel companion (1)	Location (5) Interest (4) Physical strength (2) Social density (1) Prior knowledge (1) Time budget (1)
Food & Restaurant (38)	Need deprivation (16) Meal time (12) Plan failure (5) Downtime (3) Context dissatisfaction (2)	Memory (26) Smartphone (12) Menu (5) Friend (2) Travel companion (1) Map (1) Nearby people (1) Staff (1)	Prior knowledge (26) Interest (19) Location (16) Time budget (7) Ambiance (7) Price (5) Other consumers (5) Online review (3) Restaurant size (2)
Shopping & Purchase (18)	Context dissatisfaction (7) Remote shopping (6) Downtime (3) Plan failure (2)	Smartphone (15) Memory (9) Staff (3) Travel companion (1) Nearby people (1)	Location (11) Prior knowledge (9) Price (6) Interest (1)
Route & Transportation (12)	Transit (5) Context dissatisfaction (3) Downtime (2) Plan failure (2)	Road sign (6) Smartphone (5) Staff (4) Nearby people (4) Map (3) Memory (3) Friend or relative (2) Travel companion (1)	Interest (4) Price (3) Ease of use (3) Prior knowledge (3) Location (2) Social density (2)

Note: numbers in the table refer to the numbers of decision-making scenario

5.2.1.1 Attraction- & Place-related Decision Making

The first information processing pattern and strategy appeared in terms of attractions and places. Three contextual antecedents were found to trigger active information searches and

processing: downtime (DM6, DM49, DM151, DM153), plan failure (DM34, DM69, DM78), and an unsatisfactory context (DM19). Under such circumstances, participants tended to actively seek information from various sources including smartphones (DM19, DM49, DM78), staff (DM69, DM151), guidebooks (DM78), and travel companions (DM34) (Figure 5.2).

Participant #12 provided an example of this information processing pattern triggered by plan failure. When she discovered that the space museum and art museum she had planned to visit were closed, she went to the information desk in search of information about nearby attractions or places.

"I just said to other people, 'The lady said there is a painting exhibition, and there is another one there, so let's go…' it was the ***information desk****'s idea." (DM69)*

Participants used several criteria when evaluating alternative options to reach a final decision. Attraction location, namely the distance between participants' location and the desired attraction (DM34, DM49, DM69, DM78, DM153), was a common decision criterion. Personal interest was similarly important (DM6, DM78, DM151, DM153). Other criteria included physical strength (DM34, DM151), prior knowledge (DM49), social density (i.e., queues or crowdedness) (DM19), and time budget (DM34).

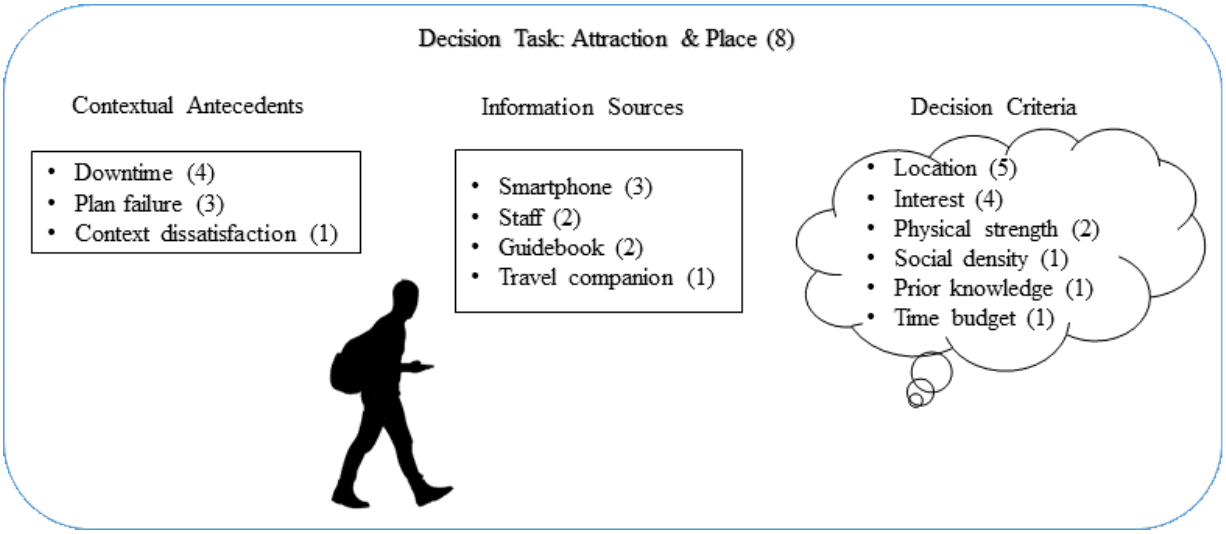
Participant #9 explained that she actively searched for information about nearby attractions via smartphone during downtime. Her decision to visit the Red Pavilion was based on her prior knowledge about it and its location.

*"I search '****nearby****' on the mobile map, the famous places nearby, to see where I wanted to go, or the [streets] I could walk around. I found the Red Pavilion. I used to watch the news, popular*

*stars held concerts there. So I **knew this place**. The Red Pavilion, the History Museum, and the Science and Technology Museum are located **in the same area**. So I walked to the Red Pavilion [by] following the mobile navigation." (DM49)*

Participant #4 provided an example of actively searching for information due to dissatisfaction. After noticing a crowd, she searched for information via smartphone and decided to visit the food market according to social density.

*"When we arrived at the bus station, we saw **a lot of people**. They were waiting in line to visit the island. So we searched for **online information**. We were told that after getting off the bus, you can go hiking which is on the left, or go to the seafood market which is on the right. Considering the **huge crowd** on the left, we turned right and went to the seafood market following smartphone navigation." (DM19)*



Note: numbers in the figure refer to the numbers of decision-making scenarios

Figure 5. 2 Pattern 1 in Attraction- & Place-related Decision Making

5.2.1.2 Food- & Restaurant-related Decision Making

Context-triggered active information search patterns and strategies emerged in 38 food- and restaurant-related decisions. When making food- and restaurant-related choices, participants relied on physical or physiological conditions such as need deprivation (i.e., feeling hungry, starving, or thirsty) (16 scenarios) or a sense of mealtime (12 scenarios). Information searches could also be triggered by plan failure (5 scenarios), downtime (3 scenarios), and context dissatisfaction (2 scenarios) (Figure 5.3).

Participants tended to actively search for food and restaurant information or dining options from memory (14 scenarios). In addition to internal sources, participants utilised several external sources to search for relevant information. Smartphones (12 scenarios) and restaurant menus (5 scenarios) were common sources. Other participants referred to friends (DM31, DM170), travel companions (DM39), nearby people (DM104), staff (DM31), or the information board of a shopping mall (DM129).

Participants' personal interest (19 scenarios) was the most common decision criterion, followed by restaurant location (16 scenarios), previous knowledge about the restaurant or food (16 scenarios), and time budget (7 scenarios). Certain restaurant features (e.g., ambiance (7 scenarios), other consumers (5 scenarios), price (5 scenarios), online reviews (3 scenarios), and size (2 scenarios)) were also used in judgements and decisions.

For example, induced by a state of need deprivation, Participant #11 actively searched for nearby food options and decided to choose a familiar brand based on his prior knowledge.

"*I was **hungry**. We saw a Subway. Sandwiches. So we **recognised** it because we [knew] it from home. I am not very adventurous with food. So we decided to go with **something we knew**. So we went to Subway." (DM67)*

Participant #18 reported that when her original dinner plan failed, she actively searched for nearby dining options. She made her decision based on the restaurant's location, size, and online rating.

*"I looked for the restaurant for a long time. When I found it, **it was already closed**. I was tired, and my mum became unhappy then. So I searched for nearby restaurants on the **Dianping app** but found that they were not really **close to us**. I did [not] want to spend long looking for them. I looked around and found a restaurant that looked **relatively big**. Then I searched [for] it on the **Dianping** and the **rating** was okay. So I went in." (DM112)*

This participant also mentioned her time budget as another decision criterion: "*I would [have liked] to have local cuisine but had no choice at that time.*"

Participant #26 provided an example, citing an unsatisfactory context. She did not want to go to nearby restaurants because "*[there was] an Italian restaurant, we know Italian food by heart, it's not for us. So we said we don't want Italian food, and the Chinese, Cantonese food. We are going there tonight. We didn't want too much [of] the same food. We preferred not to eat there*." She searched for information about restaurants via smartphone and made her decision based on personal interests and restaurants' atmosphere.

"*When we were walking around this neighbourhood, we saw a Thai restaurant. I told my husband there's a Thai restaurant around. And he found it **on the Internet**. He knew which one I*

was talking about. He checked on the Internet…. We wanted to eat Thai food. We decided we [would] have some drinks. And after that, we would come back with a taxi to the hotel. And go to eat in the neighbourhood… That restaurant was quite busy, [and it] had a ***nice atmosphere****. I know I really* ***like*** *Thai food." (DM166)*

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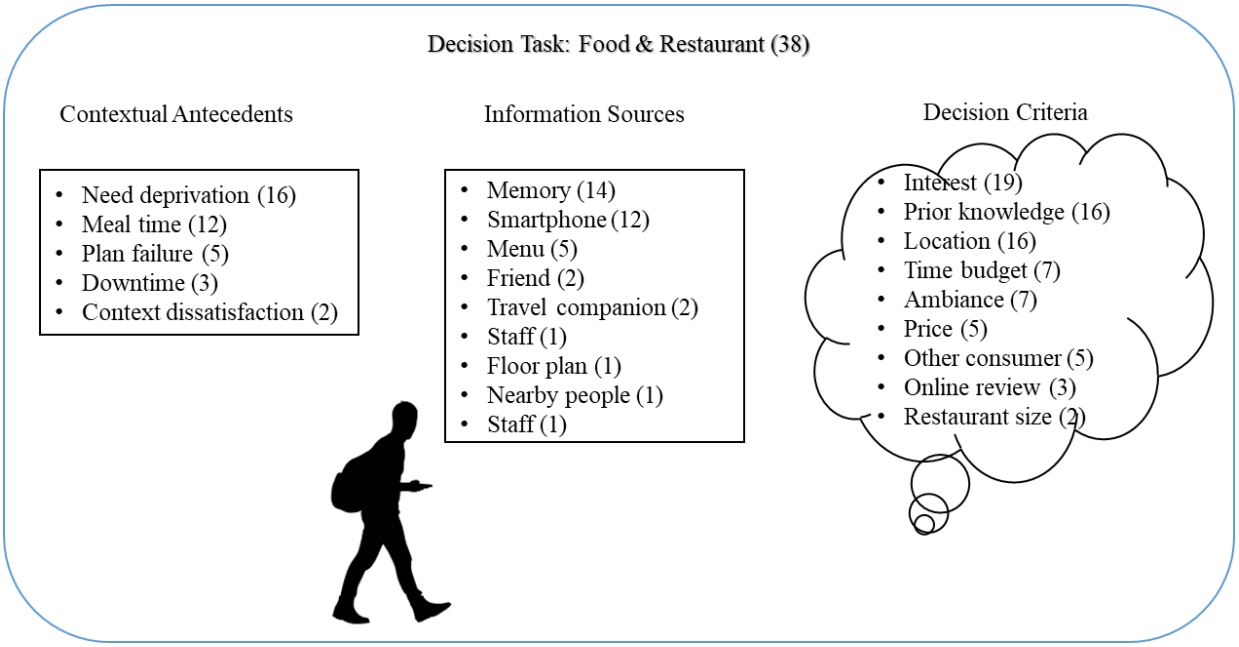


Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 3 Pattern 1 in Food- & Restaurant-related Decision Making

5.2.1.3 Shopping- & Purchase-related Decision Making

Eighteen shopping- and purchase-related decisions were triggered by context. Participants reported actively searching for relevant information due to context dissatisfaction (7 scenarios), downtime (3 scenarios), and plan failure (2 scenarios) (Figure 5.4).

Of all information sources, participants used smartphones most (15 scenarios). Pattern 1 was observed in a newly emerged shopping context, mainly driven by the convenience of the mobile Internet. This shopping context was labelled 'remote shopping' (6 scenarios). In these cases, participants made shopping- and purchase-related decisions on behalf of others, usually their friends. Smartphones played an indispensable role in communicating and exchanging information, thereby assisting in evaluation. In this study, remote shopping was especially prominent among Chinese tourists. Participant #3 described decision making in motion in a remote shopping context.

"***My friend*** *asked me to buy some medicine for her. Since I did not know what it [looked] like, I asked the* ***salesperson*** *several times. My friend only gave me the names of the medicine, however, I found there [were] so many different varieties. So I asked her when I was not sure. I* ***took a photo and asked her****, 'Is this the one you want to buy?' Also, I told her about the* ***price***." *(DM13)*

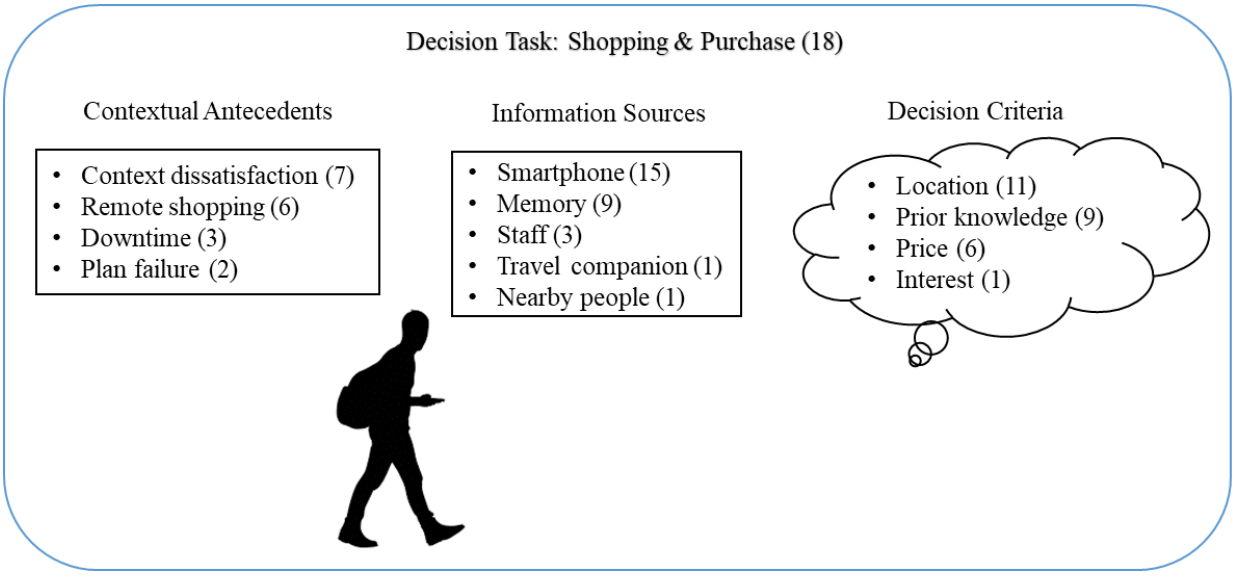
Participants with products, brands, or general categories in mind made on-site decisions regarding when and where to purchase. These participants used smartphones to actively search for shop locations (DM7, DM8, DM15, DM17, DM41) or to acquire information about products (DM18). Participants also actively searched shopping-related information from memory (DM1, DM7, DM8, DM15, DM17, DM18, DM41, DM61, DM123), store staff (DM13, DM18, DM128), travel companions (DM63), and nearby people (DM109).

Findings revealed that participants using Pattern 1 mainly considered store location when making shopping- and purchase-related decisions (11 scenarios). Another important decision criterion was previous knowledge of shops or products (9 scenarios). Price (DM1, DM13, DM18,

DM61, DM92, DM184) and interest (DM41) were also valuable. Price appeared to be the predominant decision criterion in remote shopping scenarios.

Participant #26 stated she actively searched for online information via smartphone during downtime and made a shopping decision based on her previous knowledge and experience.

*"When we were in the bar, we wanted to see what kind of shops they have in the mall. So we checked the **website**. We saw they have a Muji store. You know Muji? It's the Japanese lifestyle store where they sell planners. I **know** this store from London when I used to go to London during my high school years... So I **used to** buy planners from Muji all the time. So I decided it's a good time to buy one here." (DM164)*



Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 4 Pattern 1 in Shopping- & Purchase-related Decision Making

5.2.1.4 Route- and Transportation-related Decision Making

A context-triggered active information search pattern and strategy applied to 12 route and transportation decisions. This pattern was commonly triggered by transferring from one location to another (DM66, DM102, DM140, DM158, DM167), context dissatisfaction (DM115, DM180, DM182), downtime (DM95, DM13), or plan failure (DM147, DM190) (Figure 5.5).

Participants used a combination of information sources to move around in an unfamiliar environment. Road signs were most frequently used (6 scenarios) because "*[the signs are] extremely simple and clearly indicated*" *(Participant #25, DM158)*. Smartphones, especially with GPS functionality, could offer instant, convenient information based on participants' locations. Smartphones were therefore used in five decision-making scenarios. Participant #23 used digital and printed maps to actively search for travel routes, as each map had different functions.

"*I walked back from Tsim Sha Tsui to the hotel. I used both. The* ***mobile map*** *is best for showing where you are. You hit the [button and] it shows where exactly you are whereas the printed map is easier for holding. It's easy for turning.*" *(DM140)*

Two other common information sources were hotel staff (DM66, DM133, DM167, DM182) and nearby people (DM102, DM115, DM158, DM182). Other participants actively searched for route- and transportation-related information from memory (DM95, DM115, DM190), local friends or relatives (DM102, DM133), and travel companions (DM147).

Studies have suggested that tourists consider transportation modes, available routes, and transportation costs when choosing routes and transportation modes (Lew & McKercher, 2006). However, the present study highlighted the importance of hedonic factors. Many participants made

decisions about routes and transportation according to personal interests (DM102, DM140, DM147, DM190) and previous knowledge (DM95, DM115, DM190).

Participant #16 searched for information via smartphone and road signs during downtime. Her decision to take the Star Ferry was based on her location and prior knowledge.

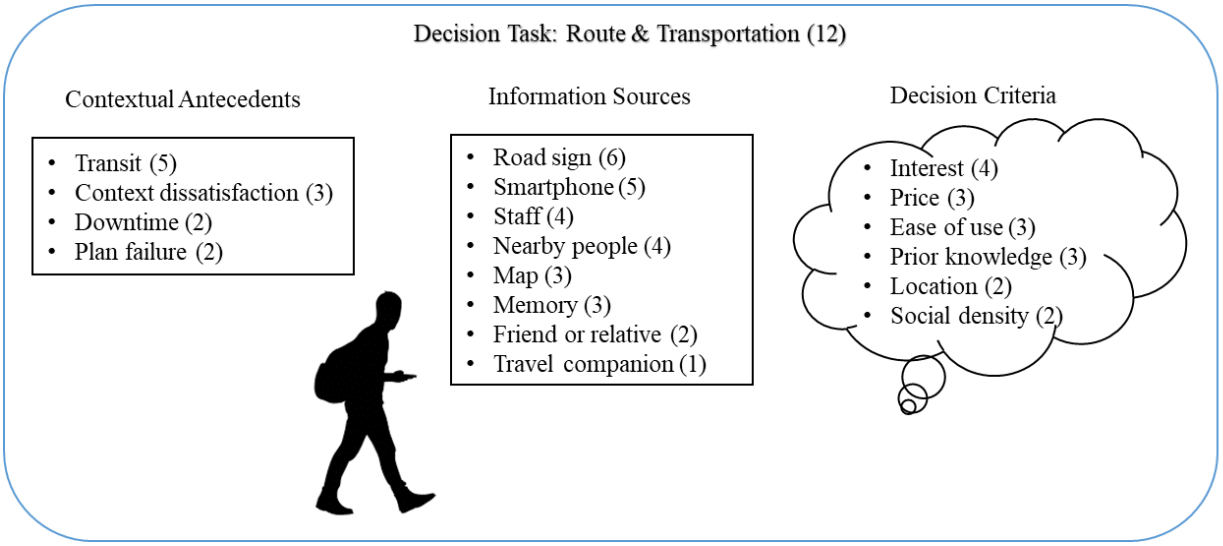
"I was a little confused at that time. I was thinking about ***what I [could] do****. I looked at the* ***mobile map app*** *to see* ***where I [was], what [was] around me****. I found Victoria Harbour was* ***next to me****. Then I decided to go to that area… I was looking [while] walking along the overpass, which was very long. When I nearly arrived at the Victoria Harbour, I saw a* ***road sign*** *showing the directions to Tsim Sha Tsui, the Star Ferry, etc. Then I thought I would ride on the Star Ferry. [Because] the Star Ferry was* ***listed in the '50 must-see places'*** *by the National Geographic Traveller." (DM95)*

Participants also tended to choose convenient and simple transportation (DM133, DM140, DM158). For instance, Participant #22 decided to take the Star Ferry after she asked the hotel concierge and her cousin, a local resident.

"Because the ***concierge*** *told us [to take the ferry]. It's all through the hotel. The hotel told us where to go. Plus, my* ***cousin*** *said it was very* ***easy****…we just asked her in the morning. She said the Star Ferry was really nice, so she said [we] should do that. Probably gonna be more* ***convenient*** *especially since the shuttle bus was going down to the terminal." (DM133)*

Some participants mentioned social density when describing how they made route- and transportation-related decisions (DM102, DM182). Participant #17 was returning home and asked a local friend for route information. She ultimately decided to take the bus because "***My friend***

*also said that there are **fewer people** on the bus than the subway and the bus is more comfortable. Also, the city night view by the window is beautiful*." *(DM102)*



Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 5 Pattern 1 in Route- & Transportation-related Decision Making

5.2.2 Pattern 2: Passive Information Feeds Initiate Information Processing

Participants reported that they often passively received information about tourism products and services from various sources when exploring a destination. Unexpected information cues played important roles in capturing their attention, stimulating interest, and generating or realising needs. Such cues then facilitated participants' information processing, leading to tourism-related decisions. Passive reception, processing, and responses to the information feed comprised of on-the-go tourists' second information processing strategy. After being passively exposed to information cues, tourists could also need further information to guide their judgements and final decisions. The second pattern emerged in 48 decision-making scenarios: 15 related to attractions

and places, 17 related to food and restaurants, 11 related to shopping and purchases, and 5 related to routes and transportation (Table 5.2).

Table 5. 2 Pattern 2: Passive Information Feeds Initiate Information Processing

Type of tourism products	Information sources	Decision criteria
Attraction & Place (15)	Smartphone (5) Map (4) Travel companion (3) Peer (2) Guidebook (2)	Interest (10) Location (7) Prior knowledge (5)
Food & Restaurant (17)	Travel companion (7) Pass-by option (7) Friend (3) Smartphone (2)	Recommendation (9) Interest (6) Ambiance (5) Other consumers (4) Location (3)
Shopping & Purchase (11)	Smartphone (5) Pass-by option (4) Road sign (3) Travel companion (3) Guidebook (1)	Prior knowledge (7) Location (4) Interest (3)
Route & Transportation (5)	Pass-by option (5) Travel companion (2) Map (1) Nearby people (1)	Interest (4) Prior knowledge (4) Location (2) Price (1)

Note: numbers in the table refer to the numbers of decision-making scenario

5.2.2.1 Attraction- & Place-related Decision Making

Pattern 2 was observed in 15 attraction- and place-related decisions. Participants passively received information about attractions and places mainly via smartphones (DM58, DM 88, DM134, DM168, DM179) and maps (DM22, DM29, DM149, DM169). Other information feeds included travel companions (DM5, DM71, DM85), peers (DM30, DM179), and guidebooks (DM79, DM169). These information feeds piqued participants' interest in attractions and places (10 scenarios). Participants were also reminded of previous knowledge, which influenced their

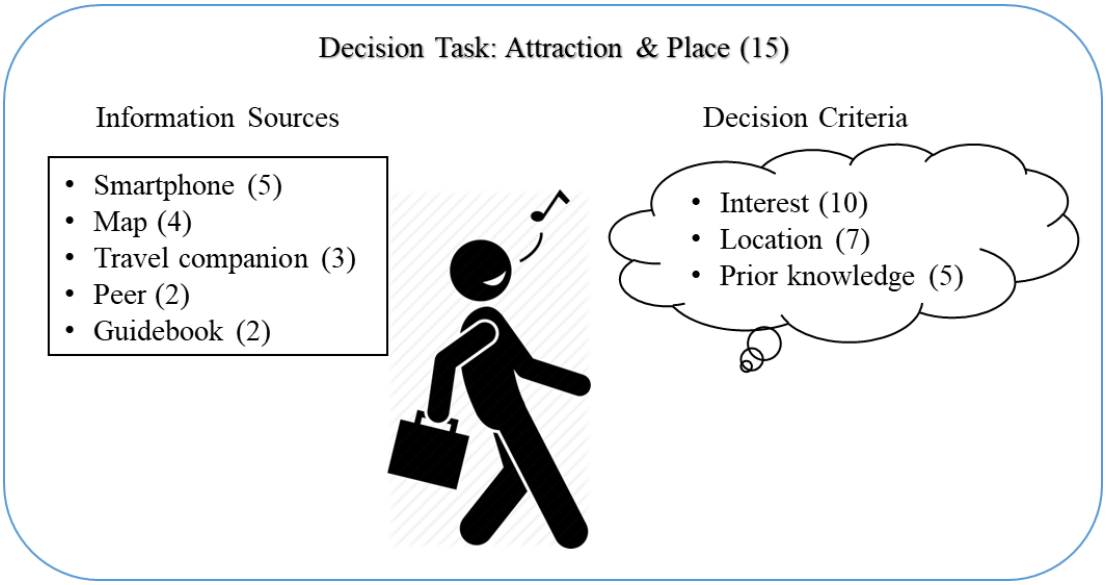
decision-making processes (5 scenarios). In addition to interest and previous knowledge, participants made attraction visitation decisions based on location (7 scenarios) (Figure 5.6).

Participant #4 described making a visitation decision based on an information cue he received from a map. He made the decision based on prior knowledge of the attraction, his interest in it, and its location.

*"I saw the **road map** of the Hong Kong subway system when I was in the subway. I found that Wong Tai Sin was **close** to the place that I was going to. I **had heard** [about] that attraction from the travel websites. Before the trip, I looked at the travel guidelines with the attraction rankings. I also read other tourists' reviews [to] see whether I was **interested** in it or not, then I decided. Since it was in the transfer station, **very close**, I decided to go to Wong Tai Sin later." (DM22)*

Participant #27 decided to visit the Hong Kong park due to information cues via smartphone. The park's location was one decision criterion.

*"The idea was to walk back slowly to the hotel through Hong Kong Park. [I] saw that on the map. Logged onto **Google maps** and saw the tram station was actually fairly **close to the hotel, with the park between**. We thought we would go back through that. Oh yes. I have seen the park in the hotel as well, quite close. When we were here. We [had] already committed to our road. So here the road we should have taken from the hotel to the tram station was through the park. We could walk, it would be OK. But we didn't know [it at] that time. We went far to the metro, walking. So I decided on the way back, we would do the road we should do." (DM169)*



Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 6 Pattern 2 in Attraction- & Place-related Decision Making

5.2.2.2 Food- & Restaurant-related Decision Making

Pattern 2 emerged in 17 food- and restaurant-related decisions. Relevant information cues came from participants' travel companions (DM27, DM62, DM64, DM65, DM82, DM83, DM157) and local friends (DM57, DM101, DM171), which induced information processing and decisions. Participants reported often making decisions based on personal recommendations (9 scenarios). They also stated that information feeds from travel companions and local friends increased their interest in recommended options, which influenced their evaluations and decisions (6 scenarios).

Participant #10 trusted a travel companion's expertise and based decisions on her companion's recommendations in addition to personal interest.

"*[**My travel companion**] brought me to a restaurant. She asked me, '[Would] you like to have the roast duck?' I said yes. She said, 'Let's go. I am taking you there.' I [**wanted] to try** the roast duck since it was commonly seen in Hong Kong. I thought it was [a] local specialty… Since she had been here twice, I [believed] that she would take me somewhere nice." (DM62)*

Some participants simply complied with travel companions or friends (DM57, DM82, DM83, DM101, DM157, DM171). For example, Participant #14 was taken by her travel companion to a dessert shop. She explained, "*I think **he** really likes this dessert place. That was the **main reason** we went there actually*." *(DM83)*

While on the move, participants were often attracted by pass-by restaurants or food (7 scenarios). According to Participant #26, she was lured by a dessert shop while strolling in the shopping mall, which stimulated her interest and generated a need, spurring her decision.

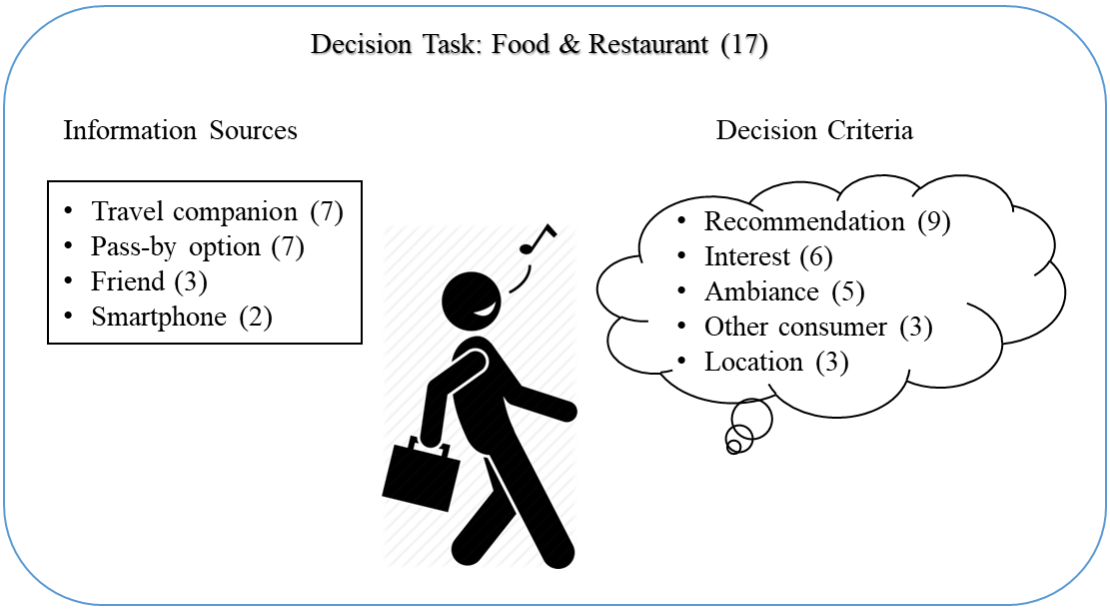
*"We arrived **somewhere in the middle**. There was a kind of art plaza, and they had some dessert, Japanese dessert. It **looked really, really good**. We ate dessert*." *(DM162)*

Furthermore, participants tended to evaluate alternative options based on restaurant features such as ambiance (DM3, DM21, DM72, DM132, DM136), other consumers (DM3, DM21, DM27, DM72), and location (DM63, DM65, DM99). Participant #19 saw a coffee shop while walking around. She decided to visit based on the café's ambiance.

"*We were not familiar with the brand. Because it was a really small shop. Just like a **calm area**. It was nice to just sit and relax. And to gain some energy." (DM132)*

Local consumers' presence could create a sense of authenticity around food, which influenced participants' evaluative and affective processing (Figure 5.7). Participant #4 noticed a

place serving local food when she got off the bus: "*It seemed like* ***not a tourism place****. Lots of* ***local consumers*** *there and the staff [could not] speak Mandarin. I used body language to communicate with him. I thought it* ***must be good****. So I bought that.*" *(DM21)*



Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 7 Pattern 2 in Food- & Restaurant-related Decision Making

5.2.2.3 Shopping- & Purchase-related Decision Making

Passive information feeds were reported in 11 shopping- and purchase-related decision-making scenarios. Participants explained how passive information feeds influenced their shopping- and purchase-related decisions. Pass-by stores (DM52, DM68, DM125, DM188) or road signs (DM89, DM91, DM176) were the most common feeds. Some participants mentioned having passed a store or spotted a road sign and then recalling an advertisement, information, recommendation, or past consumption experience. In these cases, participants were likely to make

shopping- and purchase-related decisions based on previous knowledge (DM52, DM89, DM91, DM125, DM176, DM188) (Figure 5.8).

Participant #9 described responding to information feeds from pass-by options and making decisions based on prior knowledge:

*"I went out with my friend from Exit D of the tube station. Then I **passed** a cosmetic store, I **remembered** that the online travel guidelines had mentioned it. So [I] just went in. I did not specifically plan to go there, just **had heard about it before**."* *(DM52)*

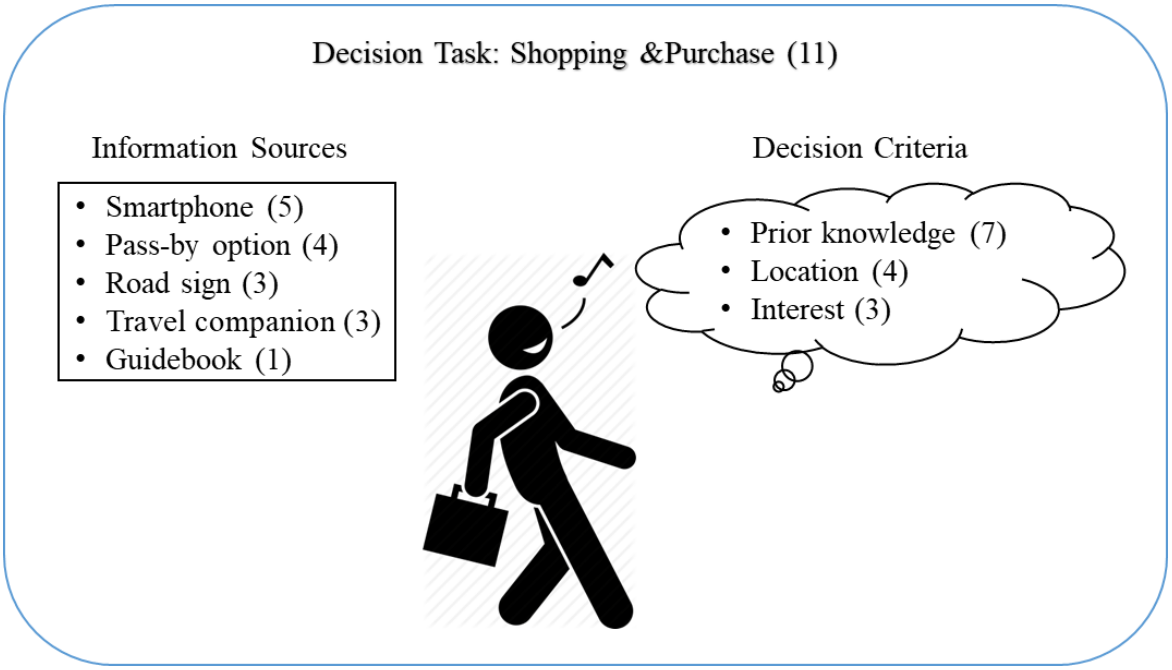
For a participant who saw a store or product for the first time, with no knowledge or experience to help in evaluating alternatives, the decision was made based on interest:

"*We walked to the tube station. But next to the tube station, there was a shopping mall... So we went to have a look to see if there [were] any discounts or clothes we liked. I wanted some trainers maybe. But not really. Nothing in particular. We just wanted to **have a look and see**.*" *(Participant #11, DM68)*

Some participants gathered information via smartphone to facilitate information processing and decision making (DM73, DM89, DM161, DM176, DM189). In addition to knowledge and interest, store location was a common decision criterion (DM73, DM80, DM89, DM189). Participant #30 described how she responded to unexpected information cues from her smartphone and decided to go to a store based on its location and her knowledge.

"*Muji was not in my itinerary. **Before the trip**, my friend told me that if you go to Harbour City, the Muji store there is the biggest and very cheap. When I was in the hotel, I searched how to get to the Lama island from **[my] smartphone**. I found that the Harbour City was **located** at Tim*

Sha Tsui where I would take the ferry to the Lama island. Since it [was] ***close*** *[to the ferry station], I decided to go to the Muji store first and then to Lama island.*" *(DM189)*



Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 8 Pattern 2 in Shopping- & Purchase-related Decision Making

5.2.2.4 Route- & Transportation-related Decision Making

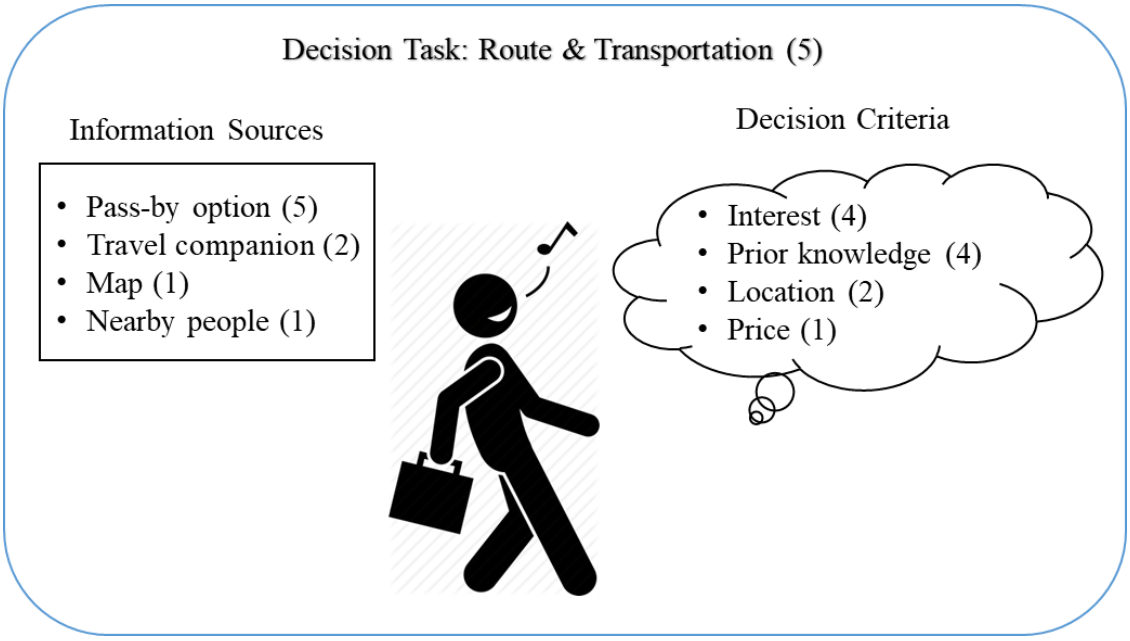
Five route and transportation decisions involved passive information feeds. In these scenarios, participants happened to see a vehicle, which triggered their interests and needs and then induced information processing and decision making (DM26, DM35, DM54, DM84, DM173). Some participants collected additional information from travel companions (DM35, DM54), bus maps (DM26), or nearby people (DM173) (Figure 5.9).

Participants tended to make transportation- and route-related decisions according to previous knowledge (DM26, DM54, DM84, DM173) in addition to interest (DM26, DM35, DM54, DM173). For instance, Participant #28 saw the Ding Ding Tram when he was exiting the metro station. He knew that the tram was an old and unique mode of transportation in Hong Kong. Then, he actively sought route information from nearby people and made a decision based on his knowledge and interest in the tram.

"*I decided to take the tram when I **saw one**. I thought maybe we [could] take one to Wan Chai. Because I **[wanted] to try**, I want to see the city. So I **prefer to** take the tram than the metro. You know, the tram in Hong Kong is popular so **everybody knows that.** I asked somebody, **a local person**. He was waiting for the tram and I asked him, 'Is this tram going to Wan Chai?' He said, 'Yes, you can take this,' so I took it.*" *(DM173)*

Apart from previous knowledge, Participant #15 cited the price of transportation as a criterion when making a decision:

"*We saw the Big Bus. **We have done those in other cities**. When we [have] been to other places, like the hop-on-hop-off bus, and it's the same thing as this. That's why we decided to do this because we have done that before in other cities. We thought about it. And we saw the **price** was quite expensive for four. But then we worked out some other pieces in it. There was a **family discount**. Also, [it] **included the tram ticket**. So they had the tram.*" *(DM84)*



Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 9 Pattern 2 in Route- & Transportation-related Decision-Making

5.2.3 Pattern 3: Context-triggered Cancellation Decisions

Participants' original trip plans were often affected by unexpected situations and/or social and physical limitations that required plan revisions. Decisions to postpone or cancel planned travel activities on the basis of contextual constraints comprised the third information processing pattern and strategy. This pattern occurred in 26 decisions: 17 about attractions and places, 5 about food and restaurants, and 4 related to shopping and purchases (Table 5.3).

Table 5. 3 Pattern 3: Context-triggered Cancellation Decisions

Type of tourism products	Information sources	Decision criteria
Attraction & Place (17)	Staff (4) Smartphone (1) Peer (1)	Time budget (12) Interest (4) Weather (5) Location (3) Physical strength (3) Social density (3) Social input (2)
Food & Restaurant (5)		Time budget (3) Location (3) Physical strength (2)
Shopping &Purchase (4)		Interest (3) Time budget (2) Physical strength (1)

Note: numbers in the table refer to the numbers of decision-making scenario

5.2.3.1 Attraction- & Place-related Decision Making

Seventeen decision-making scenarios involved cancelling or postponing attraction- and place-related plans. When facing contextual constraints, most participants searched for additional information before reaching decisions. Others collected attraction information from attraction staff (DM4, DM138, DM146, DM152) and smartphones (DM178). Participants reported that cancellation decisions were generally invoked by their time budget (12 scenarios) or physical strength limitations (3 scenarios) (Figure 5.10). Therefore, these constraints represented major decision criteria. Participant #8 cancelled a museum visit due to physical strength:

*"We were probably a little bit **tired** and preferred to come back to have a swim. You know. We had a good day, a nice lunch, we thought we **relaxed**." (DM46)*

Participants' interests in attractions also shaped their decisions (DM20, DM103, DM146, DM175). Participants tended to maintain a 'priority list', using a hierarchy of personal importance

to achieve each item. Plans at the bottom of the list were likely to be discarded. As Participant #18 said, "*I will give time to the place I must go first.*"

When asked why he did not attend an exhibition as planned, Participant #28 explained he had decided based on his personal interest and time budget.

"I changed my plan. I don't know. You know, I do not prepare a lot. I don't have [much] organisation. I just ***follow my heart doing what I want to do at the time****. I can't do everything. So I am OK... I* ***can't do everything in one day****." (DM175)*

Weather conditions (DM76, DM152, DM159, DM178, DM186), social density (DM20, DM138, DM152), and attraction location and accessibility (DM4, DM146, DM178) also spurred participants' decisions to cancel attraction plans. Participant #13 described using information from peers and deciding based on weather conditions.

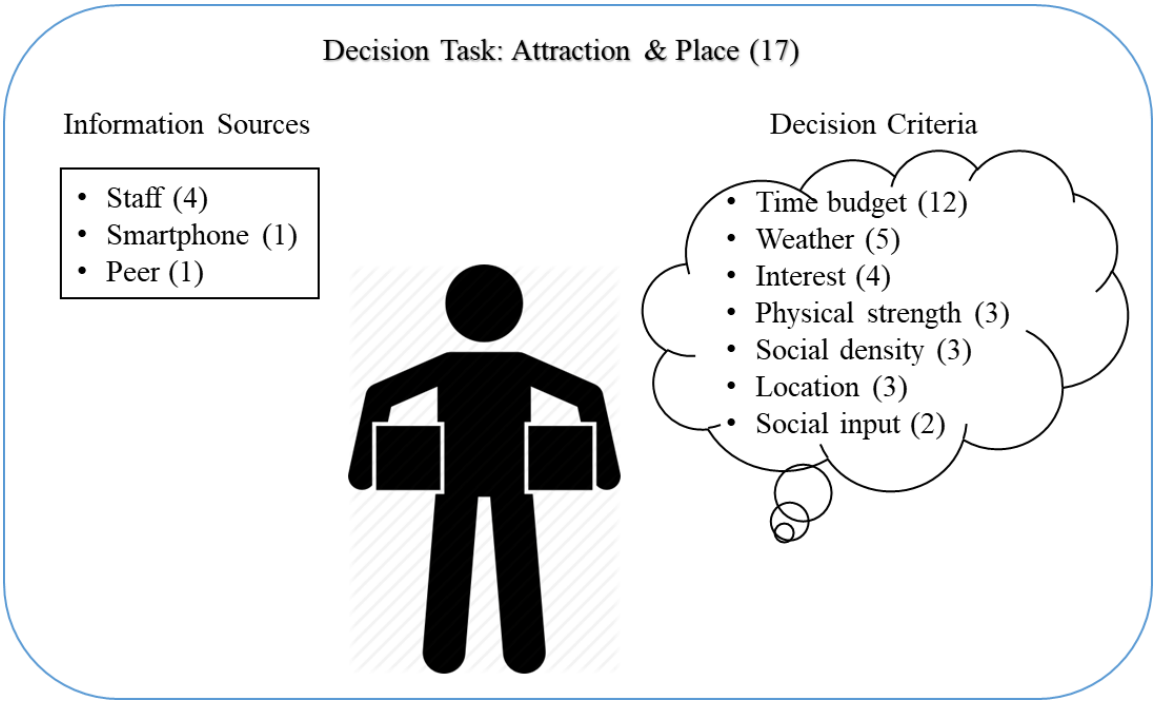
"We could get to Admiralty, but we thought it was still ***cloudy*** *in the Peak. So we thought we [wouldn't] go to the Peak because it was cloudy. We [wouldn't] see the views. On the bus, we talked about it. We saw the* ***weather****, the clouds up there. And we spoke to* ***somebody on the bus*** *as well. They were Chinese people living in Liverpool, in the UK. So they went to Stanley as well, they were on the same bus... And they said, 'Where are you going to go?' We said Peak. They said, 'Well if you wait until tomorrow. The weather will be better. You won't see anything up there today.' So we changed our mind. We [went] back to Central." (DM76)*

Participant #25 acquired information from staff and made a cancellation decision due to social density:

"[There was a] ***very long queue*** *and [it was]* ***very hot****. My husband asked* ***the front,*** *'How long is the waiting time?' 'One and a half hours.'...It was very hot at midday. We both said 'OK, let's forget about it.' We decided 'OK, thank you very much, but let's not go to the Peak today.'" (DM152)*

Other participants reported that their cancellation decisions were triggered by social input, mainly from travel companions (DM94, DM192). Participant #16 explained,

"After we finished our dinner, [my ***travel companion****] said that she wanted to go back and was not going to the Peak. She was a bit tired, so she wanted to go to bed. I was a bit disappointed when I heard that. I wanted to go to the Peak. I thought there was still a lot of time. I thought [there] was still plenty of time that I could see the night view. We were so close to the Peak. She just left and took the subway back. I thought, 'That's it.' I gave up." (DM94)*



Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 10 Pattern 3 in Attraction- & Place-related Decision Making

5.2.3.2 Food- & Restaurant-related Decision Making

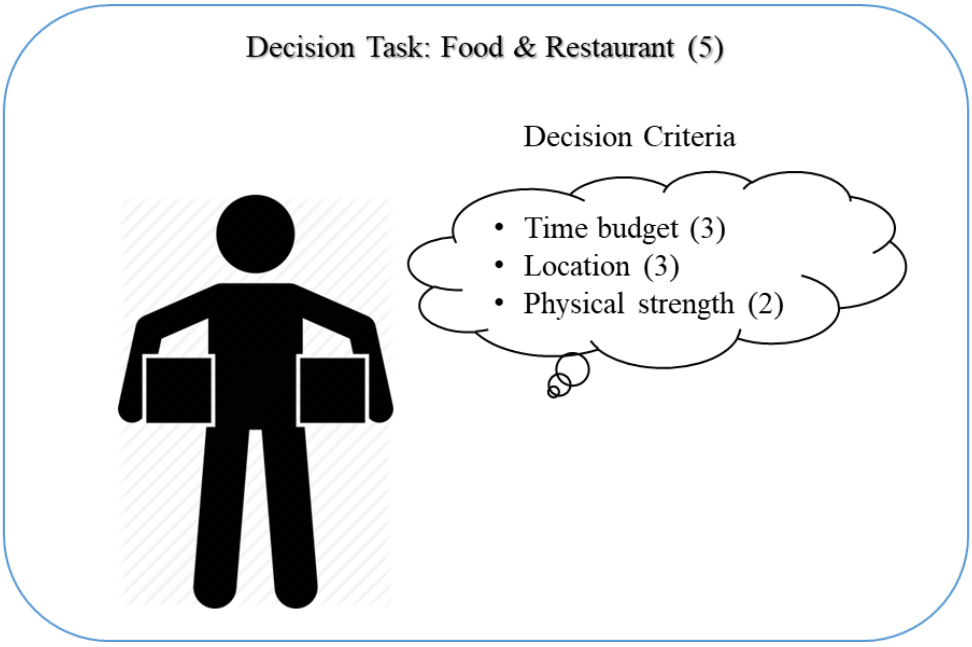
Five decision-making scenarios regarding food and restaurants involved Pattern 3. Participants' cancellation decisions were typically induced by time budget (DM40, DM43, DM105), restaurant location (DM40, DM43, DM127), and physical strength (DM127, DM155) (Figure 5.11). For example, Participant #15 decided to cancel plans to eat in the night market due to physical strength.

"*We had dinner in the hotel. We [thought we] would go somewhere else...We thought about that. But we were quite* ***tired*** *so. We were thinking of the night market, but my wife wasn't feeling*

so well. So she was a little bit… Otherwise, we would probably go for dinner in the night market somewhere." *(DM155)*

Participant #7 described cancelling original dinner plans because of the time budget and tea house location.

"We planned to go to a dim sum restaurant in Mong Kok, but it [was] too far. And we wanted to go to Causeway Bay. It [would be] ***a little far*** *if we [went] to Mong Kok to have dinner and then [went] to Causeway Bay. That would be* ***too late****. Since* ***one is in the north and the other is in the south****. That's it." (DM43)*



Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 11 Pattern 3 in Food- & Restaurant-related Decision Making

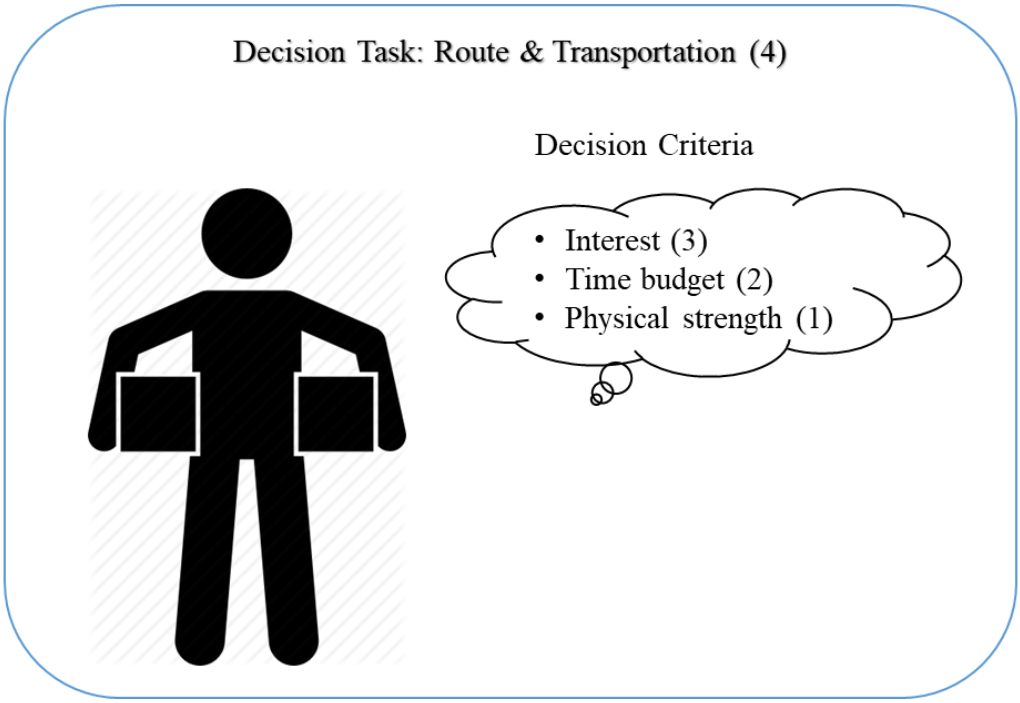
5.2.3.3 Shopping- & Purchase-related Decision Making

Context-triggered cancellation decisions appeared 4 times in shopping and purchase scenarios. Based on reports, participants' decisions to cancel shopping plans were often influenced by personal interests in planned items or the importance of consequences (DM59, DM98, DM100) (Figure 5.12). Participant #16 explained cancelling plans to visit Mong Kok due to an interest in the purchased item.

"*The only reason was that **this shoe is not what I want to wear now**. I wanted to take it home. So I thought I could buy it at any time during these days*." *(DM98)*

Participants also mentioned that their shopping plans were subject to their time budget (DM59, DM60) and physical strength (DM60). Participant #10 decided to cancel shopping plans in Causeway Bay for these reasons.

"*I didn't buy anything by then, and I was very **tired**… The Causeway Bay was over there, in Hong Kong Island, far from my place. Another reason is that there seems to be a lot of shops in Causeway Bay. We wanted to **spend more time shopping there**. So we would not go there today.*" *(DM60)*



Note: numbers in the figure refer to the numbers of decision-making scenario

Figure 5. 12 Pattern 3 in Route- & Transportation-related Decision Making

5.3 Roles of Smartphones During Decision Making in Motion

Empirical evidence from this study revealed that tourists often used smartphones while travelling in a destination. Smartphones offer new ways for tourists to interact with destinations. Therefore, smartphones influenced travellers' interpretations, interactions, activities, and decision making on the move. Various smartphone functions informed decision making in motion for the four tourism product categories. This section describes how tourists used smartphones while on the move. It also details the extent to which smartphone usage influenced tourists' decision making in motion.

5.3.1 Smartphone Use on the Move

Participants discussed how they used smartphones while on the move. Reasons included acquiring spatial knowledge, accessing real-time information, and maintaining local and distant social networks. To explore the intersection of smartphones, travel, and decision making in motion, findings are focused around three key smartphone-based activities during decision making in motion (i.e., navigation and wayfinding, information acquisition, and communication and socialisation).

5.3.1.1 Acquiring Geographic Knowledge on the Move

Participants acquired geographic information about their destination while exploring their surroundings. Smartphones and their geo-based services were frequently used to enhance participants' understanding of their geo-position. This information could help tourists judge distance, spatial distribution, and association. Travellers could also develop a sense of direction and orientation (i.e., recognition of tourists' own position and movement within places) (mentioned by 14 participants).

Smartphone maps were especially helpful for participants to obtain route information and find their way while navigating an unfamiliar destination. Participant #23 explained that smartphone maps were a convenient tool to recognise people's positions and movement: "*The **mobile map** is best for **showing where you are**. You hit the button [and] it shows where exactly you are*."

Geographic knowledge acquired from smartphones was closely associated with travel-related decision making in motion. As discussed in the previous sections, distance and travel

direction fall under the geo-position dimension of on-the-go tourists' decision-making context. Distance and direction are other important decision criteria. In addition to the specific location of a service, perceived distance played an influential role in determining how well a service suited participants' needs. Any slight change in place associations and positions relative to others could influence tourists' service choices. Participants reported using smartphone maps frequently to determine the distance between restaurant options and participants' locations. Participant #18 described how distance affected her ultimate choice. Although she had initially planned to go to Restaurant B rather than Restaurant A, she actually went to Restaurant A because it was closer to her location.

Thirty decisions across the four types of tourism products involved using smartphones to obtain geographic knowledge. Smartphone maps were most commonly used when shopping and making purchases (13 scenarios). Participants used these maps in 6 attraction- and place-related decisions, 6 food- and restaurant-related decisions, and 3 route- and transportation-related decisions. Some participants also used review apps for navigation and wayfinding in restaurant-related decisions (DM93, DM104).

In addition to smartphones, attaining geographic knowledge was facilitated by numerous offline sources. Such sources were evident in participants' movement between places including interactions with others (e.g., concierge, companions, friends, peers, and locals), road signs for searching, and wayfinding behaviours. Participant #27 described finding the route to the Peak using spatial knowledge from hotel staff, road signs, and smartphone maps. Maps were especially useful for judging distance.

*"Initially, we stayed in the hotel, reception, tried to use my phone, but it didn't work. So we asked the **hotel reception**. Then we took the metro to Central station because we were planning to take a bus because we decided it yesterday. Then we found a **sign** to the Peak from the Central station. We followed the signs. And the phone was working. [We] used Google maps to get there…So we followed the signs, but we **used the mobile to see the distance**." (DM167)*

5.3.1.2 Obtaining 'Real-time' Information on the Move

Smartphones were one of the most important information sources participants used to gather real-time information. Participants reported using smartphones to search for information about handling various tasks on demand. Tourists typically gathered information from search engines (12 scenarios), and travel apps (7 scenarios), while on the move.

Real-time information affected tourists' decision making across the four types of tourism products. Smartphones were used to acquire real-time information in 8 food- and restaurant-related decisions, 5 shopping- and purchase-related decisions, 4 attraction- and place-related decisions, and 1 route- and transportation-related decision.

When making decisions about food and restaurants, participants often used review apps to search for alternative options (DM93, DM112, DM116, DM165). Tourists also collected additional information such as restaurants' operating hours (DM160, DM192) and other consumers' opinions (DM105, DM166).

*"I searched for nearby restaurants on the **Dianping app** but found that they were not really **close to us**. I did [not] want to spend long looking for them. I looked around and found a restaurant*

*that looked relatively big. Then I searched [for] it on the **Dianping [app]** and the **rating** was okay. So I went in." (Participant #18, DM112)*

In terms of shopping- and purchase-related decision making, some participants used search engines to look for stores and product information (DM17, DM18, DM73, DM164). One participant reported seeing information about a shopping mall on a tourism app (DM161). During attraction- and place-related decision-making processes, participants were likely to collect new information about destination attractions from tourism apps (DM88) and search engines (DM179). For example, Participant #29 searched for information via a search engine after hearing about the Peak from a friend.

"*I asked him, 'Where did you go yesterday?' If he said it was fun, I could go there today. And he told me about the Peak…After that, I searched for the address of it. When you type the Peak on the **search engine**, you can see **a lot of information**. Finally, I went there because I got a key message when I searched. Some people say that if you can only go to one place in Hong Kong, they would **recommend** the Peak. Also, I wanted to take a photo there. Because you can have a panoramic view of Hong Kong.*" *(DM179)*

Furthermore, one participant reported using a search engine when deciding about transportation.

*"I saw a very long queue when I arrived at the tram station. I was considering if I should wait…you know, [there were] so many people there. I **searched on the Internet,** see if there is any other way to get to the Peak except for taking the tram and how long other people had waited in line. Then I found that I [could] take Uber, but the whole trip [would] cost around 200 Hong Kong*

dollars. I thought if I [took] a taxi, it [would] cost that much even for the one-way trip. I said fine, I'll just wait." (Participant #29, DM180)

5.3.1.3 Maintaining Local and Distant Social Networks on the Move

Smartphones and mobile Internet, which allow for ubiquitous, instant communication and connection, have dramatically transformed interaction between tourists and their social networks. Participants stated they used smartphones to maintain social networks on the move, both local and distant. Smartphones could thus affect tourists' decision making and resulting behaviour in many ways.

Several participants engaged in social activities in their destinations, such as visiting local friends and relatives (Participants #9, #16, #17, #22, #27). Smartphones were used to communicate with friends and arrange schedules in real time. Participants were also likely to consider friends' or relatives' recommendations when making decisions about where to go, what to do, and where to eat. Overall, smartphones played indispensable roles in the group discussion via participants' social networks.

Participant #27 described making a decision to go to a dim sum restaurant, which was facilitated by a smartphone. The participant used a smartphone to receive a local friend's recommendation. The smartphone was also helpful in communicating about the tourist's meeting time and location.

"We had originally said 6:00 pm, but then we changed the time at 5:00 to move it later. Because we knew it was gonna take us longer to go on the cable car. We said we would let you know when we were coming back…So we took the metro back. East Tsim Sha Tsui. We went to

meet them at the P entrance. We went to the restaurant which was fine and had some dim sum. We ***asked our friend*** *to show us some authentic Hong Kong food which we hadn't had before. And dim sum was suggested. Because we had dim sum before in London, but food in England is different." (DM170)*

Participant #22 spoke via smartphone with her cousin, a local resident, about the Star Ferry and the bus tour during when deciding.

*"****My cousin*** *said it was very easy…we just asked her in the morning. She said the Star Ferry was really nice, so she said you should do that... [For the Bus tour], She just said it would be a good idea. Because it was raining." (DM133)*

Participants constantly interacted with distant social networks through online chats (Participants #3, #18, #20, #30), social media (Participants #16, #29), and video calls (Participant #17) on the move. Information or ideas generated through those activities reportedly shaped participants' decision-making processes. For example, Participant #9 described a spontaneous decision-making process guided by distant social networks via smartphone.

"I have heard from other friends and colleagues. They shared information about the Peak on WeChat Moments. I knew that the Peak is a famous attraction. When I was in the dessert shop, I had a chat with a friend ***on WeChat****. He had shared a post on WeChat Moments a long time ago. We just talked about the Peak. He said that the mountain is not high, taking around one hour to climb to the top, and there are lots of shops at the top. I was thinking I could climb the Peak in the evening. So I just decided that." (DM58)*

In the remote shopping context, communication with distant social networks via smartphones was especially crucial for decision making in motion. Participants frequently used smartphones to communicate with friends for whom participants were making shopping- and purchase-related decisions (DM13, DM61, DM92, DM96, DM109, DM184).

"My friends asked me to buy lipsticks. I had been talking with them ***via smartphone.*** *They also asked me to try the colours… I asked '[It costs] 155 dollars, do you want to buy it?'" (Participant #16, DM92)*

5.3.2 Roles of Smartphones in Tourists' Information Processing

As discussed in the previous section, participants used smartphones to acquire spatial knowledge, real-time information, and maintain social networks on the go. Smartphone use played various roles in participants' information processing during decision making in motion.

5.3.2.1 Roles of Smartphones in Pattern 1

The first information processing pattern involves active interaction with the information environment, triggered by participants' immediate contexts. Participants actively sought information from various sources, processed that information, and made judgements. In these situations, tourists used smartphones to search for nearby points of interest, evaluate plan items, and engage in remote shopping. Smartphones thus served as 'advisors', 'examiners', and 'intermediaries'.

The 'advisor' role stemmed from smartphones' location-based functionality and was related to tourists' smartphone use for acquiring geographic knowledge on the move. Under certain circumstances (e.g., plan failure, context dissatisfaction, downtime, and needs deprivation),

participants used smartphones to search for nearby points of interest catering to their instant, spontaneous needs (observed in 11 scenarios). Smartphones served as knowledgeable advisors committed to providing alternative options to effectively facilitate decisions. Mobile maps, search engines, and review websites were commonly used to identify nearby restaurants (DM55, DM93, DM112, DM116, DM121, DM165), attractions (DM19, DM49), shops (DM51, DM164), and transportations (DM95, DM180) based on participants' locations.

"When we were in Ozone, we didn't really like the organisation of the bar. We didn't like the bar at all actually... So we checked if there's any other restaurants or bars inside of the tower where we would have a nicer drink, you know…So we decided to change. We ***checked it with Handy*** *what options they had inside the Ritz Carlton…We found on the official website, the Ritz Carlton. We found their* ***choice of dining and restaurants and bars****. We saw they had another bar on the 103rd floor." (Participant #26, DM165)*

Second, participants tended to have plans or intentions before trips. They also appeared to reinforce items on their plan lists and complete decision-making processes while on site. Smartphones were used to re-examine contingency plans or preliminary ideas according to various factors. Characteristics included time availability, financial and physical resources, service accessibility, and individuals' shifting preferences or interests. Smartphones assumed an 'examiner' role in participants' execution of plans or intentions.

This smartphone role was mainly observed during decisions about food and restaurants and shopping and purchases, resulting in an interplay of planned and improvised decisions. Participant #2, a food lover, mentioned having made several contingency plans about local food and restaurants prior to the trip but made a final choice via smartphone while on site.

*"I had three plans of the Steamed Rice in Clay Pot, two in Yau Ma Tei, and one in Sheung Wan. I found from the **smartphone map** that the subway to Sheung Wan was not convenient. So I went to Yau Ma Tei." (DM10)*

For shopping- and purchase-related decision-making scenarios, participants commonly used smartphones to search for shop locations (DM7, DM8, DM13, DM15, DM17, DM41, DM51, DM61, DM92, DM96, DM123) or additional information about products they knew about before their trip (DM18). Smartphones exerted large impacts on participants' evaluations and final decisions. Participant #20 described the following situation:

"*We felt that there were quite a lot of shopping malls around us, and we could just stroll around and see if we could find something to buy. When I made the travel plan, I saw the Long Cheng Shop from the website. I was interested to go there. I searched on the **smartphone map** and found it was **close**. It was said that the cosmetics there are very cheap and there are often many people waiting in line. So take a look at there.*" *(DM123)*

Third, smartphones' 'intermediary' role in Pattern 1 applied to remote shopping scenarios during smartphone use to maintain social networks and communication. With advances in smartphones and the mobile Internet, remote shopping defies the traditional understanding that consumers must be in a store to shop. As such, smartphones acted as intermediaries for exchanging shopping- and purchase-related information. Smartphones also supported discussions between tourists and their friends, which was essential to information processing and decision making.

5.3.2.2 Roles of Smartphones in Pattern 2

Pattern 2 is characterised by passive information feeds that induce information processing and decision making. Smartphones played a role in Pattern 2 by inspiring new travel ideas and reminding tourists of pre-existing items in memory. These two roles were labelled 'initiator' and 'reminder'.

Participants sometimes happened to see or hear about a tourism product or service for the first time via smartphones. This exposure triggered information processing and decision making. Relevant information could also pique participants' interest in the product or service and inspire them to add it to their itineraries. The 'initiator' role of smartphones was mainly observed in attraction- and place-related decisions. Participants often found initial information about destination attractions through smartphone maps (DM134, DM168) and tourism apps (DM58, DM88).

"We went to the waterfront. To the Harbour. To watch the Laser Show. Because it starts at 8 o'clock… [I knew it] from the same, ***things to see in Hong Kong*** *(i.e.,* ***tourism app****). We were sort of reading about it as we went around." (Participant #22, DM88)*

In terms of shopping- and purchase-related decisions, Participant #26 reported obtaining information about a shopping mall from a tourism app. This information inspired him to visit the mall.

"That's my husband who found this one. He wanted to go there because he saw something on the Internet saying this is the most hip, fashion, trendy mall for young people. So he wanted to

*go there to see the place. You know, **the Handy device**, it has **suggestions**. I think he found it there." (DM161)*

The 'reminder' role occurred when the participants obtained information about a place or product via smartphones and recalled knowledge about it, a prior decision, or past experience with the item. These reminders influenced information retrieval from participants' memory, thus spurring decisions (observed in 4 scenarios). In comparison with the 'examiner' role of smartphones which emphasises the evaluation of alternative options, the 'reminder' role of smartphones plays a part in the very early stage of the decision-making stage which can inspire a need or stimulate an interest.

***"Before the trip**, my friend told me that if you go to Harbour City, the Muji store there is the biggest and very cheap. When I was in the hotel, I searched how to get to the Lama island via **smartphone**. And I noticed that the Harbour City was located at Tim Sha Tsui where I would take the ferry to the Lama island. Since it is close [to the ferry station], I decided to go to the Muji store first and then the Lama island." (Participant #30, DM189)*

5.3.2.3 Roles of Smartphones in Pattern 3

Pattern 3 encompasses cancelling or postponing planned items, mostly due to unexpected contextual constraints. Participants used smartphones to evaluate planned items based on situations. Smartphones played an 'eliminator' role in Pattern 3 by recommending that tourists either postpone or discard plans. This role emerged in 1 attraction- and place-related decision and 1 food- and restaurant-related decision.

Participant #29 had planned to go to a history museum and art museum but decided to postpone the plan due to the museums' locations. The participant used a smartphone map to assess the distance, direction, and orientation of museums. Doing so eliminated these options from consideration.

*"I **searched the locations** of the history museum and art museum while on the go. I went to the Kowloon park and the coffee shop in the morning, which were very close to the subway station. However, the two museums were relatively far from the station and they were in the **opposite direction**. If I [went] to the museums, I [would need to] walk back to the station after that." (DM178)*

Regarding food- and restaurant-related decisions, Participant #18 reported that her original plan was to go to Lu Yu restaurant. During the decision-making process, she searched for restaurant information via a review app, which informed her cancellation.

*"I wanted to go to Lu Yu Teahouse…I looked at **Dianping** when I was in another restaurant because I wanted to know if there is any dish in the restaurant that particularly attracted me. Usually, I prefer not to do the information search in advance because I think the amount of information is quite large on a daily basis. I found the dishes were mainly the same as what I had, nothing looked new. Also, given the consideration of the time, **I decided not to go there.**" (DM105)*

5.4 Summary of the Chapter

This chapter integrates and organises the study results to answer the research questions. The fundamental research problem that needs to be addressed is: How do tourists make decisions in motion? To address this problem, this study investigates three questions. The first question is

about the contexts of tourists' decision making in motion. In this study, 150 scenarios involving decision making in motion were observed related to four kinds of tourism products and services (attractions and places, food and restaurants, shopping and purchases, and routes and transportation). Seven dimensions of context in which spontaneous decisions emerged were identified including the servicescape; information; social; intrapersonal; geo-position; time; and weather dimensions.

The second question is about the information sources, information processing strategies, or heuristics used by tourists during decision making in motion under each scenario. This study identified three information processing patterns and strategies on-the-go participants applied, namely context-triggered active information search, passive information feeds initiate information processing, and context-triggered cancellation decisions. These approaches explained how tourists interacted with information and which decision criteria they used. Moreover, the information processing patterns and strategies were varied by the tourism product category.

The third question is about the roles of smartphones during decision making in motion. Three key types of smartphone usage of on-the-go tourists were noticed: acquiring spatial knowledge, accessing real-time information, and maintaining local and distant social networks. The use of smartphones informed decision making in motion for the four tourism product categories. Furthermore, smartphone usage played various roles in participants' information processing during decision making in motion. Smartphones served as 'advisors', 'examiners', and 'intermediaries' in the first information processing pattern. Smartphones played roles in the second information processing pattern by inspiring new travel ideas and reminding tourists of pre-existing items in memory. These two roles were labelled 'initiator' and 'reminder'. Smartphones played an 'eliminator' role in Pattern 3 by recommending that tourists either postpone or discard plans. In

order to provide a comprehensive understanding of the focal phenomenon, the next chapter presents a detailed discussion of this study's results.

CHAPTER 6 DISCUSSION

This chapter revisits the research questions of this study and presents the discussion oriented around the findings reported in Chapter 5. This chapter provides a detailed discussion of this study's results to address each research question. Based on the discussion relating these findings to the relevant literature, this study provides a comprehensive framework describing tourists' decision making in motion and linking it to the fundamental research problem.

6.1 How do spontaneous decisions emerge while tourists are exploring a destination?

Research Question 1 investigates the context within which various spontaneous decisions emerge while tourists are exploring a destination. As discussed in the literature review, preferences and choices are constructed, rather than innate, within the contexts of each decision task (Bettman et al., 1998; Bettman & Park, 1980a; Decrop & Snelders, 2005). Previous studies emphasised the importance of multi-contextual factors in delivering on-demand services tailored to users under specific circumstances (Meehan et al. 2016; Kim & Albers, 2002; Meng-Yoke Tan, Foo, Hoe-Lian Goh, & Theng, 2009). On-the-move tourists tend to make many decisions depending on various contextual dimensions (Hwang et al., 2006). Recognising the influential role of context in the decision-making process (Dickinson et al., 2014; Lamsfus et al., 2013), tourism studies have begun to investigate the context of decision making. However, previous studies proposed different contextual types and properties with little empirical work to validate these propositions. Furthermore, there is a lack of understanding of tourists' goals and interests with respect to their contexts (Meng-Yoke Tan et al., 2009).

By collecting empirical evidence in real-world settings, this study demonstrates the influence of the multi-dimensional context on tourists' decision making in motion. The context is

conceptualised into seven dimensions: the servicescape; information; social; intrapersonal; geo-position; time; and weather dimensions. Although some contextual dimensions unearthed in this study have been discussed in previous studies, the structure and property of the context of tourists' decision making in motion are distinct from those identified in previous studies. The TILES model (Meng-Yoke Tan et al., 2009) proposed five types of tourism contexts: Temporal, Identity, Location, Environmental, and Social. These contextual types are mainly extracted from existing mobile tourism applications. In the TILES model, the temporal context describes the current time of day and the current date. However, the present study demonstrates that tourists' decision making in motion is not only related to the objective time, such as time of the day and biological clock but also associated with people's psychological concept of time, which determines how much time on hand (i.e., presence or absence) for participating in a travel activity. This finding is consistent with previous studies on tourists' spatial-temporal behaviour suggesting that time budget influences travel patterns of tourists, and their choices of travel activities (Grinberger et al., 2014; McKercher & Lau, 2008; Huang & Wu, 2012). Moreover, this study reveals that many spontaneous decisions emerge during tourists' downtime—that is, a period of time unoccupied by any activity. Thus, the time contextual dimension in this study consists of time budget and downtime.

The social contextual dimension is both identified in this study and the TILES model. In the TILES model, the social context refers to travel companions and other tourists nearby. This study reveals that smartphones and the mobile Internet expand tourists' social contexts by supporting both local and distant social networks. Therefore, tourists' friends and relatives, both local and distant, in addition to travel companions constitute the social dimension of the context of decision making in motion. Indeed, the advancement in information technology and ubiquitous Internet access have exerted substantial influence on the structure of tourists' decision-making

context. During the trip, tourists frequently engage in the acquisition and interpretation of information to address a wide variety of needs with respect to itinerary management, collecting or reinforcing travel ideas, and navigation (i.e., wayfinding). The present study highlights that the information dimension, which is comprised of online and offline information, constitutes an important dimension of the context of tourists' decision making in motion. This study also fills the research gap regarding a lack of inclusive model explaining tourists' use of information sources during their trips (Kozak & Decrop, 2009).

Since this study focuses on on-the-go tourists, a unique dimension of their decision-making contexts has emerged from the analysis of data, namely geo-position. While moving in the destination, tourists' temporal and spatial positions keep changing continuously. Previous research suggested that the spatial layout of the destination such as the number and spatial distribution of attractions, the spatial relationship between accommodation and attractions can influence tourist behaviour in the destination (Lew & McKercher, 2006). This study demonstrates that the geo-position in terms of perceived distance between tourists' current location and desired service, as well as tourists' travel directions, has an influence on decision making in motion. Thus, it is identified as an essential dimension of the context of decision making in motion.

Furthermore, the context framework proposed in the current study is distinct in that it includes the weather of tourists' immediate physical surroundings as a contextual dimension of decision making in motion. Previous research suggested that the weather has a limited influence on tourist behaviours within urban destinations (McKercher, Shoval, Park, & Kahani, 2015). However, this study reveals that tourists' decision making can occur in various weather conditions. While travelling in the destination, tourists make decisions on the basis of temporal weather

conditions such as rain, heat, clouds, sunsets, typhoons, and storms. Different results in this study may be attributed to the great mobility of tourists in motion.

The findings of this study echo previous research in environmental psychology with an emphasis on the importance of environmental effects on people's perceptions, emotions, behaviours, and experiences (Chein, 1954; Clitheroe et al., 1998; Brunswik, 1960; Mehrabian & Russell, 1974; Kotler, 1973). However, environmental influence in travel settings has been inadequately studied. This study provides a comprehensive, systematic description of the context in travel and tourism settings. Previous studies have discussed the dimensions, description, or properties of the context within which behaviour processes occur (Proshansky & O'Hanlon, 1977). Distinctive findings are reported in this study due to the unique feature of tourism consumption. The servicescape framework proposed by Bitner (1992) has been widely adopted to examine the effect of the service environment on customer behaviour. This study demonstrates that servicescape is an integral dimension of tourists' decision-making contexts. An in-depth investigation of servicescapes in travel settings unveiled five components, which are ambiance, space and function, signs, symbols, and artefacts, other consumers, and pricing and promotions. Furthermore, this study reveals that travel decisions emerge not only in the service settings but also in other settings (e.g. on the street, on public transportation). Thus, the characteristics of other settings should also be considered in explaining the complexities of tourists' decision making. Previous studies mainly focused on physical, social, and individual aspects of the environment; yet, these studies provide little information about the properties of each aspect. This study advances prior studies by identifying seven main contextual dimensions and defining properties associated with each dimension.

Previous studies generally take into consideration all types of travel products and services. This study reveals the differences in the contexts of tourists' decision making in motion with respect to different types of tourism products and services. For instance, the intrapersonal contextual dimension has been noticed to be influential in the processes of attraction and place-related decision making as well as shopping and purchase-related decision making, suggesting the importance of tourists' previous knowledge on these types of decision making in motion. In terms of food and restaurant-related decision making, the intrapersonal, servicescape, and geo-position dimensions are prominent and constitute the decision-making contexts of tourists in motion. This finding can be explained that food and restaurant-related decision making is commonly triggered by tourists' physiological conditions (e.g., hunger and thirst), and tourists appear to search for dining options close to their locations and decide according to specific features of consumption conditions. In line with Hinze and Buchanan (2005)'s findings on interactions between contextual categories, this study demonstrates that tourists' decision making in motion cannot be attributed to a single type of contextual factors—rather, these contextual dimensions are interrelated and jointly contribute to the occurrence of decision-making in motion. The findings in this study provide an integral, comprehensive explanation of the features and properties of on-the-go tourists' decision-making context. The amalgamation of seven influential contextual factors not only expands prior studies but also contributes new knowledge to research in the travel context.

Previous research has suggested that the interaction or transaction between people and the environment affects individuals cognitively and behaviourally (Gifford, 2007; Wohlwill, 1974; Stokols, 1978). This study suggests that the dynamic interactions between tourists in motion and their contexts lead to the formation of images, perceptions, beliefs, judgments, and needs, which have important implications for information processing (cognitively) and resulting decisions

(behaviourally). As mentioned in Chapter 3, Stokols (1978) proposes two basic dimensions of the processes of human-environment interaction: cognitive (or symbolic) vs. behavioural (or physical) forms and active vs. reactive phases. This study's findings suggest the active and passive phases of tourists' interactions with their contexts have an effect on tourists' cognitions and behaviours. When triggered by certain contexts (such as downtime, plan failure, and unsatisfactory contexts), tourists would actively search for information from numerous sources to inform decisions. Tourists may be passively exposed to information cues from the context that initiate information processing, leading to tourism-related decisions. It is further noted that such a passive phase of tourist-context interaction can also be followed by an active phase of the interaction. After being passively exposed to information cues, tourists could also actively search for further information to guide their judgments and final decisions. Moreover, this study reveals that contextual constraints can result in decisions to postpone or cancel planned travel activities. For instance, high social density in the servicescape dimension, such as crowding and long queues, is likely to inhibit tourists from participating in travel activities, which may result in the decisions of cancelling plans. The findings echo stimulation theories, which suggest that properties of environmental stimulation such as temperature, noise, crowding, and various social influences are potential sources of psychological stress that in turn can modify people's judgmental or affective responses (Gifford, 2007; Wohlwill, 1974). The dynamic forms and modes of interaction between tourists in motion and their immediate contexts unearthed in this study not only reflect previous findings (Stokols, 1978; Clitheroe et al., 1998; Brunswik, 1960; Kotler, 1973) but also expand this research stream by delineating the mechanism of tourist-context interaction that shapes tourists' decision making in motion. The comprehensive conceptualisation of tourists' context can serve as a useful guide for

providing intelligent decision making by taking into account various dimensions of tourists' immediate contexts.

6.2 How do tourists process various information cues presented in different formats while in motion?

Research Question 2 explores what catches on-the-go tourists' attention, how they process various information cues presented in different formats, and what kinds of rules or heuristics are applied to reach a decision. The empirical results and further analysis provide knowledge about information sources and information processing patterns and strategies used by on-the-go tourists.

Fodness and Murray (1998, 1999) argued that in any given purchase situation, there are three distinct dimensions of information search strategy: spatial, temporal, and operational. In terms of the spatial dimension, this study demonstrates that tourists use both internal sources (memory) and external sources (e.g. smartphone, friend, staff, guidebook) for information search while on the move. According to Fodness and Murray (1998, 1999), consumers firstly access the contents of memory for product knowledge or purchase expertise. If the internal search produces inadequate information for decision making, they will turn to external search. However, this study has found that participants initially searched for information about nearby "Point-of-Interests" from external sources. The new information could trigger the product-relevant knowledge stored in their memory. This study suggests that unlike traditional consumer information search, tourists may not rely on a single, well-defined procedure to collect information for decision making on the move.

From a temporal perspective, on-the-go tourists' information search involves not only specific searches in response to a certain decision task but also ongoing searches as they constantly

receive information from various sources. Previous studies argued that consumers may not engage in pre-purchase search, particularly if the consumer is not involved or has been conducting an ongoing search (Fodness & Murray, 1998; Kotler & Armstrong, 1994). This study provides an alternative explanation for those tourists who do not conduct information searches during the decision-making processes. They may make decisions predominantly based on affective or intuitive factors especially in terms of hedonic-driven products (e.g. food and restaurants). This finding reflects the experiential nature of leisure travel and the openness of tourists' behaviours, leading to affective, intuitive decision-making behaviours (Morrison, 2010; Holbrook & Hirschman, 1982; Hyde, 2008).

Regarding the operational dimension, in line with previous studies (Claxton, Fry, and Portis 1974; Furse, Punj, and Stewart 1984; Fodness & Murray, 1998), this study notes that memory, staff, friends, and relatives are likely to be used as decisive sources which have a major influence on decision making. In addition, smartphones also serve as a decisive source that can provide rich, sufficient, and effective information on where to go, what to do, and where to eat, etc. Fodness and Murray (1998) found that tourists are likely to use a combination than a sole information source for travel planning, while this study demonstrates that on-the-go tourists commonly make decisions based on the information collected from a solo source. Different results can be explained by the different travel stages of focus.

This study identifies and categorises three information processing patterns and strategies employed by tourists during the process of decision making in motion. Previous research often relied on the dual system theory to focus on a distinction of information processing modes with little to extensive efforts of conscious thinking. In those studies, consumers are often regarded as either following a slow, deliberate, effortful, systematic, and analytic course or a fast, preconscious,

associative, and effortless course (Samson & Voyer, 2012). Some research has noted the interaction, influence, and intervention between different systems or courses of operation that mostly operate in parallel and jointly for generating judgments and decisions (Strack et al., 2006; Sherman et al., 2014; Strack et al., 2006). To date, the relationship between different systems remains debatable in those studies. There is no clear distinction between the parallel interacting systems proposed by dual-system theory (McCabe et al., 2015). The study reveals that tourists' information processing during decision making in motion is a function of "simple, automatical processing" that relies on easily accessible information and affective, intuitive responses (i.e. positive/negative feelings), as well as "thorough, conscious processing" involving deliberate information collection, evaluation, and trade-offs. This empirical study not only complements previous studies which are mostly quantitative or conceptual but also provides an alternative way of accounting for tourists' information processing.

The unique information processing patterns and routes unearthed in this study are distinct from those proposed in previous studies. This study analyses tourists' information processing by considering the phase tourists interact with the context (i.e., active vs. passive), the criteria used by tourists to generate inferences, estimations, and judgments, and the final decisions (i.e. not planned and done vs. planned and not done). The findings provide the details of the processes underlying information processing involving a number of basic components such as contextual antecedents or constraints leading to a particular pattern, information sources, and decision criteria.

First, Pattern 1 processing unveiled in this study shares some similarities with the process delineated by the RPD model. Tourists actively participate in the interaction with context by focusing on assessing the situation and looking for relevant cues. This helps them understand plausible goals and appropriate actions, which are used to generate decisions as well as courses of

action. This study supplements previous studies by identifying a number of certain circumstances under which such active processes occur. For example, Pattern 1 is likely to be triggered by contexts within which tourists begin to realise dissatisfied needs—that is, an incongruity between their needs and perceived state. Pattern 1 typically occurs when tourists' original plans are failed, which suggests a need for developing a new plan (e.g., "*The Space Museum and Art Museum were both closed*."— Participant #12, DM69), when tourists encounter downtime (e.g., "*I was a little confused at that time. I was thinking about what I can do*."— Participant #16, DM95) and when tourists are dissatisfied with their current contexts (e.g., "*We didn't really like the organization of the bar. So, we decided to change*."— Participant #26, DM165).

Second, this study advances previous research by facilitating the development of new insights on how non-expert people make decisions while in motion. Consistent with previous studies, this study demonstrates that tourists commonly rely on their previous knowledge or experience to generate feasible, fast-paced decisions while on the go. Moreover, tourists tend to search for information from a variety of external sources, such as smartphones, staff to supplement their existing knowledge. NDM models argue that people largely rely on expert knowledge to size up situations and make decisions rapidly without comparing the strengths and weaknesses of alternative options (Klein et al., 2010; Zsambok & Klein, 1997). However, this study suggests that tourists often compare a list of options in the plan or the consideration set and make decisions based on the available resources (e.g. time, physical and money), and various factors (e.g., features of the services and other consumers' opinions). Previous NDM models cannot be fully applied in this study since the decision-maker of focus and the context of decision making are different.

Third, beyond a conventional decision-making process that begins from generating needs or goals, gathering information related to the products, evaluating alternatives, and acting, this

study contributes new knowledge by identifying different processes of information search and processing during the course of decision making. Findings on Pattern 2 suggest that tourists are often exposed to unexpected information cues while on the move and then visualise or realise a need. Those needs can be both preexisting but unrealised, as well as unintended but emergent, in turn initiating the information processing and decision-making processes. Previous research also suggested that en-route situations beyond one's anticipation would spur an unplanned decision (Hwang & Fesenmaier, 2011); specifically, tourists' decision-making processes are likely to be induced when tourists are exposed to new information (Stewart & Vogt, 1999). In addition, this study's findings echo Kotler's (1973) atmospherics suggesting that situational stimuli or cues (i.e., atmospherics) serve as attention-creating, message-creating, and affect-creating medium to transform desires and intentions that are not materialised or realised into actual consumption behaviours. Furthermore, this study notes that tourists could search for additional information to facilitate their decision making after being passively exposed to information cues. This finding implies an interaction between different information processing modes which is consistent with previous dual-system research (Strack et al., 2006; Samson & Voyer, 2012).

Fourth, previous research suggested that decision-makers may face many constraints which restrict the scope, sequence, duration, and timing of their options and choices (Dellaert, Ettema, & Lindh, 1998). Pattern 3 unveiled in this study demonstrates that tourists' original trip plans are often affected by unexpected situations or contextual constraints that could lead to postpone or cancel some planned activities. Although several studies have examined constraints or barriers of dealing with participating in leisure tourism activities or travel, previous studies are limited in dealing with the time-space constraints introduced by Hägerstrand (1970). The three groups of time-space constraints (i.e., authority constraints, capacity constraints, and coupling constraints)

provide a comprehensive overview of potential factors that limit the timing, length, and speed of travel (Hägerstrand, 1970). However, they may not be able to fully explain the constraints confronted by tourists while on-site. Rather than focusing on decisions made by tourists in planning travel components, this study supplements previous studies by identifying contextual constraints involved in the process of decision making in motion. In line with previous research on time-space constraints, this study demonstrates that decisions of cancelling travel plans can be triggered by the three types of constraints with respect to time budget, physical strength, accessibility (i.e. social density and location) (*capacity constraints*), social input (*coupling constraints*), and weather (*authority constraints*). In particular, this study reveals that coupling constraints are often confronted by the travel groups accompanied by children which are consistent with the findings in previous studies (Kah & Lee, 2014; Dellaert et al., 1998). In addition, this study reveals that tourists' decisions of canceling the plans are also influenced by personal interests in the planned items or the importance to achieve the items. Previous research has suggested that the importance of consequence and personal relevance to each decision have an influence on the processes of integrating information to generate preferences and choices (Bettman et al., 1998). Thus, this study echoes previous research emphasising the influence of the level of decision involvement on amount and pattern of information searching, evaluation of the product, and decision strategies (Beatty & Smith, 1987; Fodness & Murray, 1998; Money & Crotts, 2003; Petty et al., 1983).

Finally, this study provides detailed information on on-the-go tourists' information processing in different scenarios regarding various decision tasks. For example, this study demonstrates that tourists are typically influenced by the information feeds regarding attractions and stores in the destination pushed by smartphones, while the information input regarding local

food and restaurants, and routes and transportation are commonly provided by their travel companions. Moreover, tourists are likely to be attracted by the information cues regarding food and restaurants as they pass by. The findings in this study echo previous findings that patterns of information search and information processing during tourists' decision-making processes vary according to both contextual factors and various types of travel products (DiPietro et al., 2007; Fodness & Murray, 1998; Money & Crotts, 2003).

6.3 How do smartphones affect these activities?

Research Question 3 investigates the role of smartphones during tourists' decision making in motion. Moving beyond users' pre-adoption stage to the on-site, experiential stage, this study focuses on tourists' actual use of smartphones while in the destination. The empirical findings reveal that smartphones are used by on-the-go tourists for acquiring spatial knowledge, accessing real-time information, and maintaining local and distant social networks. These smartphone-facilitated activities are consistent with the findings of previous studies on the adoption and usage of mobile technology in travel (Wang et al., 2012; Wang et al., 2014; Wang et al., 2016). Moreover, the three types of smartphone-based activity reflect the localisation, personalisation, mobility, convenience, and usability characteristics of smartphones. These unique features enable smartphones to provide useful and up-to-date information and innovative services to on-location and on-demand tourists anytime and anywhere (Alqatan et al., 2011).

Motion is an essential aspect of travel. In the mobile technology age, accessing information and interpretation, direction, and navigation, allowing social connections on the move afforded by ICTs have important implications for tourists' decision making in motion. Previous research has indicated that ICTs allow the decision-making process to be completed at various places and times, in turn increasing dissociation between decision-making activities and locations and times at which

an activity takes place (Line, Jain, & Lyons, 2011; Couclelis, 2009; Hubers, Schwanen, & Dijst, 2008). Smartphone's loosening spatial and temporal boundaries seem to result in the "fragmentation" (Couclelis, 2009) of the decision-making process; that is, the decision-making process is divided into several smaller pieces or fragments distributed across places and over time. The findings of this study reflect the fragmentation concept; moreover, the results provide novel, in-depth insights into the forms in which such fragmentation occurs. This study reveals that tourists conduct information search about the destination before the trip—either extensively or narrowly—and rely on smartphones to implement other pieces of the decision-making process (e.g. evaluation, search for additional information, and actions) during the trip. As a result, smartphone use can lead to the temporal fragmentation (Couclelis, 2009; Hubers et al., 2008) by enabling various pieces of the decision-making process to be performed at different stages of travel. Moreover, smartphones prompt tourists to realise a need or a goal and facilitate their information acquisition, evaluation, and wayfinding while on the move. Therefore, tourists are able to perform smaller pieces of the decision-making process at multiple locations, in turn resulting in spatial fragmentation of the process (Couclelis, 2009; Hubers et al., 2008).

The use of smartphones by on-the-go tourists reflects previous research on the influence of mobile technology on tourist experience (Jansson, 2007; Dickinson et al., 2014; Lamsfus et al., 2013; Wang et al., 2014; Moores, 2004). Previous studies have noted that smartphones provide ubiquitous access to information, navigation, social networking, and entertainment, not only transforming the definition of travel and facilitating the development of tourists' experiences but also influencing travel behaviours and decision making (Mascheroni, 2007; Wang et al., 2014; Lamsfus et al., 2015; White & White, 2007; Moores, 2004; Jansson, 2007). However, previous studies are mostly conceptual and lack of information about how the influence can occur. Research

has demonstrated that the interaction between decision-makers and mobile technology has altered the context of travel, especially the decision-making environment (Lamsfus et al., 2015). The present study reveals that smartphone use by on-the-go tourists frames the geo-position, information, and social dimensions of the decision-making context. First, smartphones along with the location-based functions are used as a convenient tool to recognise tourists' locations and their movement, framing a multi-sensory image and perceptions about the geo-position dimension of context. Second, on-the-go tourists frequently use smartphones as an information source for managing itinerary and collecting or reinforcing travel ideas, thereby framing the information dimension. Furthermore, smartphones and the mobile Internet frame tourists' social dimension of context by acting as a communication medium for maintaining social networks on the move.

Through the use of smartphones, tourists are able to obtain information about the destination in various ways, including undirected or conditional viewing and informal or formal searching (Li et al., 2003). The information integration theory suggests that psychophysical and value judgments are influenced by the amount and contents of received information (Anderson, 1981). Based on the anatomisation of decision-making processes involving smartphone use, this study identified six roles played by smartphones in influencing on-the-go tourists' information processing. These roles of smartphones affect several aspects of tourists' information processing, such as information acquisition ('advisor' and 'initiator' roles) and retrieval ('reminder' role), alternative evaluation ('examiner' and 'eliminator' roles) and communication ('intermediary' role) (Lurie et al., 2018), exerting an effect on the processes of decision making in motion. Previous studies suggested that despite the increasing importance and proliferation of smartphones, tourists continue to adopt a combination of online and offline sources of tourism information to facilitate information acquisition and decision making (Pan & Fesenmaier, 2006; Andereck, 2005; Jun et

al., 2007), which is supported by this study's empirical results. Consistent with Lyu and Hwang's findings (2015), the 'examiner' role of smartphones unveiled in this study suggests that tourists use smartphones to evaluate travel information obtained from other sources.

The unique roles of smartphones echo previous studies highlighting the valuable features of smartphones for decision making. Research has suggested that the informativeness, accessibility, interactivity, and personalisation characteristics of ICTs lead to its adoption in travel decision making (No & Kim, 2015; Huang et al., 2017). The six roles of smartphones unveiled in this study stem from these features. For example, the 'advisor' role of smartphones highlights the personalisation feature—specific information catering to individual current needs. This role is also associated with the accessibility feature—the extent to which tourists can assess, navigate, and obtain the information and/or services from their smartphones. The interactivity feature of smartphones, which is related to immediate, active, communicative, and real-time feedback, can manifest in the 'intermediary' role. The 'intermediary' role also signifies the importance of the always-on accessibility feature of smartphones (No & Kim, 2015). Huang et al. (2017) identified the two general types of ICT use, namely exploration and exploitation, as two distinct mechanisms governing the travel decision-making process. The 'advisor', 'initiator', and 'reminder' roles of smartphones can be related to the exploration use, which refers to search, discovery, and formation of new alternatives. The 'examiner', 'intermediary', and 'eliminator' roles of smartphones reflect the exploitation use, which refers to the refinement, efficiency, implementation, and execution during the decision-making process.

Furthermore, smartphone roles during tourists' decision making in motion also echo previous research on the value-adding features of mobile technology for on-the-go tourists (Anckar & D'incau, 2002). During the trip, a variety of spontaneous, real-time needs of tourists arise at

numerous locations in response to unfolding situations. Anckar and D'incau (2002) suggested that mobile technology supports on-the-go tourists' various needs, including time-critical needs and arrangements, spontaneous needs and decisions, entertainment needs, efficiency needs and ambitions, and mobility-related needs. This study demonstrates that smartphones not only play a part in fulfilling tourists' real-time needs and arrangements but also exert an effect on inducing tourists' internal needs. Moreover, the findings imply the potential of smartphones for inducing unplanned decisions, which echo prior research on impulsive consumption and unplanned behaviour. Previous studies argued that the development of e-commerce and new ICTs encourages unplanned behaviours due to increased accessibility to product or service information (Strack, Werth, & Deutsch, 2006). Tourists may easily make unplanned decisions when they obtain product information and navigation aids from smartphones (Parboteeah, Valacich, & Wells, 2009). Song, Chung, and Koo (2015) suggested that serendipity messages (e.g., pop-up advertisement) for products and services obtained through the mobile Internet can stimulate tourists' unplanned behaviours, which is confirmed by this study's findings of the 'initiator', 'reminder', and 'advisors' roles of smartphones. These roles also suggest the importance of offering personalised recommendations for influencing tourists' decisions which have been highlighted in several studies (Hostler, Yoon, Guo, Guimaraes, & Forgionne, 2011; Song et al., 2015). Kah and Lee (2014) found that information disseminated by travel technology motivates unplanned behaviours during trips. However, different results were reported by Kang (2015). Kang (2015) argued that tourists who do not use smartphones appear to be less organised and more flexible; and they tend to engage in more unplanned visits compared to tourists who use smartphones. A possible explanation may be that smartphones enhance tourists' ability to handle unexpected situations or constraints at a destination, thereby fulfilling their plans. The current study suggests that on the

one hand, smartphone use may motivate unplanned travel activities by triggering new, spontaneous needs; on the other hand, smartphone use could facilitate decisions of cancelling planned activities. Thus, different results in previous studies may attribute to the mixed effects of smartphone use on tourists' decision making and resulting behaviours. This study provides a substantive understanding of the influence of smartphones in the travel context.

6.4 How do tourists make decisions in motion?

This section takes a holistic view to describe the phenomenon of tourists' decision making in motion. While theoretical progress has been made in conceptualising tourism decision making, a fundamental question remains unanswered about the extent to which extant conceptual models are reflexive enough to account for the evolution of ICTs and the practice of tourists' decision making. Adopting a phenomenology approach to examine three research questions, this study unveils the essence and general structure of tourists' decision making in motion. Based on the empirical results, a framework describing the process of tourists' decision making in motion is composed and presented (Figure 6.1). The findings of the three elements and the relationships among them shed light upon the distinctive characteristics of tourists' decision making in motion different from those identified in previous studies.

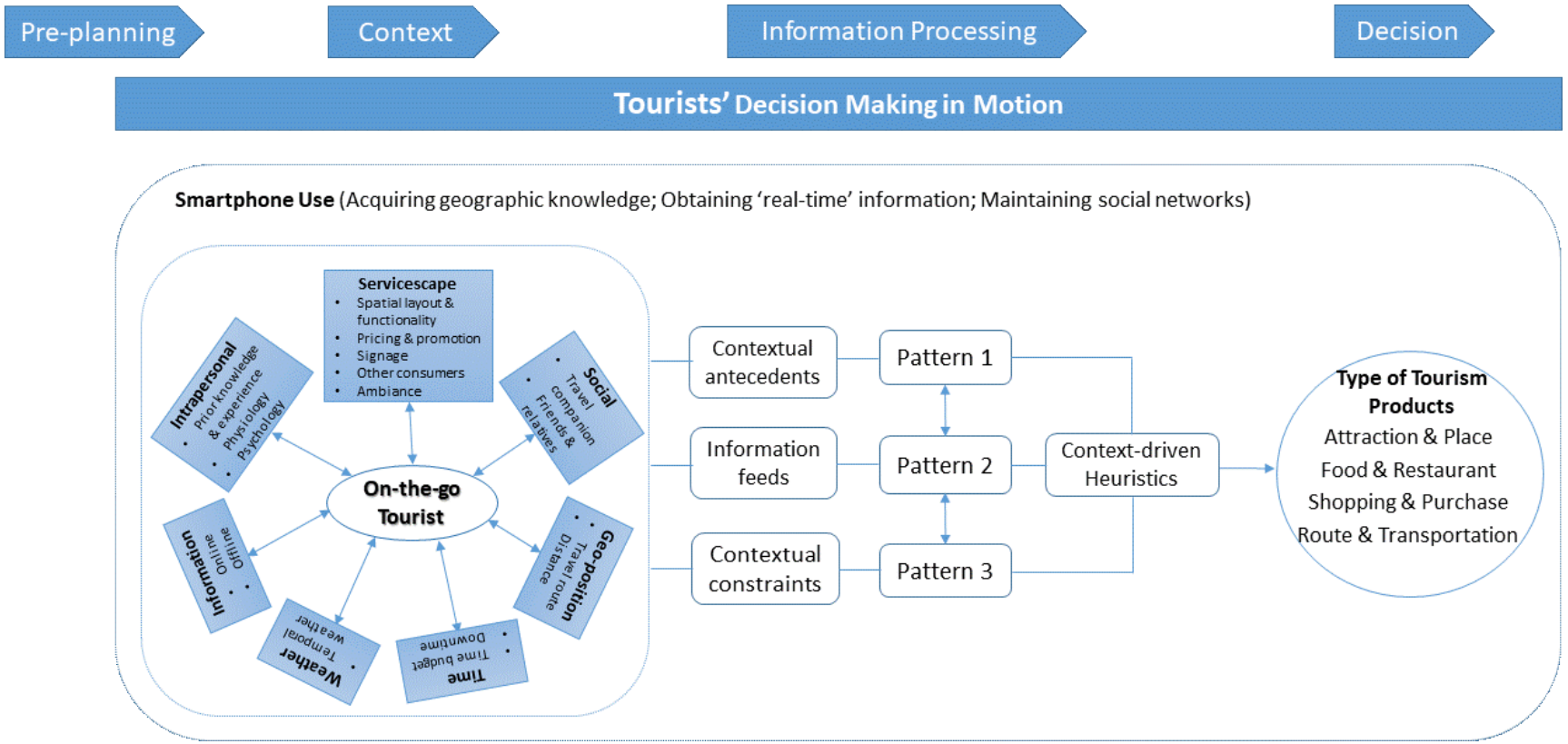


Figure 6. 1 A Framework of the Process of Tourists' Decision Making in Motion

Tourists' on-site decision making is an understudied phenomenon, in spite of the recognition that a substantial proportion of decisions are made after arriving at a destination (Hyde, 2008; Decrop & Snelders, 2005). Rather than focusing on the pre-trip stage from a travel planning perspective, this study analyses tourists' decision making in motion during the on-site stage based on real-world data. The findings of participants' travel planning reveal that the emergence of various on-site decisions grounds from nature of leisure travel and tourist behaviour (as discussed in the literature review) (Cohen, 1972; Crompton, 1979; Dann, 1981; Mayo & Jarvis, 1981; Iso-Ahola, 1982; Mannell & Iso-Ahola, 1987; Hyde & Lawson, 2003; Morrison, 2010; Holbrook & Hirschman, 1982; Hyde, 2008). Participants tended to leave some elements in vacation itineraries unplanned and expected to make decisions during trips, which confirms previous studies' findings (Hyde, 2008; Wang et al., 2012; Wang et al., 2014). In line with the stream of decision making studies building upon the perspective of tourism decision making as a hierarchical and evolutionary process (e.g. Becken & Wilson, 2007; Hwang & Fesenmaier, 2011; Hyde & Lawson, 2003; March & Woodside, 2005; Park & Fesenmaier, 2014; Stewart & Vogt, 1999), this study demonstrates that aspects of a pre-trip plan often substantially change during trips contingent on the unfolding situations. The interplay of travel plans and contextual factors lead to substantial revisions of plans and newly emerged decisions, which in turn leads to spontaneous decisions made by tourists while in motion.

The current study draws on theories of decision making, environmental psychology, information processing to study decision tasks, decision contexts, and information processing of tourists' decision making in motion. However, existing theories provide limited support for examining these components (as illustrated in Section 3.4). By tracing the decision-making processes in real-world settings, this study demonstrates that various spontaneous decisions

emerge while tourists are navigating crowds, sightseeing, and strolling in the destination. Through the dynamic interaction between tourists and their contexts, tourists make decisions on the basis of a variety of factors within the seven dimensions of each decision context. The context framework (Figure 5.1) provided by this study is distinctive from previous frameworks. Some of the contextual dimensions such as the social, time, servicescape dimensions are consistent with the findings in previous studies (Meng-Yoke Tan et al., 2009; Bitner, 1992). Furthermore, this study identified more dimensions such as the geo-position dimension, and more elements in the dimensions such as downtime in the time dimension, and online information in the information dimension. This study advances the literature by providing an adequate, comprehensive taxonomy of contextual influences in travel and tourism settings. The findings not only emphasise contextual influences on tourists' decision making but also reflect the characteristics of decision making in motion (e.g., heightened mobility, fast-paced and hyper-dense information environments, great Internet connectivity).

This study demonstrates that unlike conventional models with well-defined stages, tourists' decision-making processes are not necessarily linear or sequential; moreover, the sequences of the stages in the processes may be varied in different contexts. Although previous research has started to recognise that tourists' decision making does not always follow a uniform, structured process, previous studies provide little information about the underlying mechanisms shaping the process. Rather than considering the plurality in tourists' reasoning and decision-making styles, this study identifies the context-tourist interaction as a key factor during the course of decision making in motion; in this way, the study is useful in describing the informal and unstructured processes of decision making. Stokols (1978) argued that people "orient to the environment in terms of existing information, goals and expectations; they operate in the environment to achieve their goals [...];

they are directly affected by environmental forces" (p. 259). The current study suggests that different forms of context-tourist interaction could prompt different context-driven cognitive processes. Three information processing strategies and patterns are revealed that vary in terms of the phases of context-tourist interaction (active versus passive). The active phase of tourist-context interaction leads to Pattern 1 processing. This pattern occurs when the tourist realises an unsatisfied need (e.g. context dissatisfaction, plan failure, downtime, need deprivation) or a specific goal (e.g. meal time, transit). Previous studies in environmental psychology suggested that task-oriented consumers approach the environment with an active mindset and base their goals on cognitive schemas that assist in organising and processing information (Massara, Liu, & Melara, 2010; Dalgleish & Power, 2003). With a specific task at hand, consumers are likely to act in a top-down processing mode of information processing from the perspective of efficiency (Massara et al., 2010). In line with previous studies, this study demonstrates that participants applying Pattern 1 processing commonly relied on their existing knowledge structure for information processing or conducted specific information searches. This kind of information processing behaviours can be characterised as efficient-oriented and can be regarded as a means to some purpose.

The passive phase of tourist-context interaction leads to Pattern 2 processing. Tourists applying Pattern 2 processing often have ambiguity goals or abstract expectations and react to the incoming information stimuli in a passive mindset. Research has suggested that without a specific task at hand, consumers are likely to employ a bottom-up mode to interpret the incoming information cues from the perspective of recreation (Massara et al., 2010). In this study, participants applying Pattern 2 made evaluations and decisions largely based on hedonic factors (e.g. personal interest, emotional appeal, and recommendations), convenience-oriented and opportunistic factors (i.e., location of service and previous knowledge), which supports the

findings of previous studies. Previous studies noted that certain features from the external environment (e.g. colour, music) attracts attention and distract from the task at hand; they are disturbance factors for an active mindset but may fit a passive mind (Chebat, Chebat, & Vaillant, 2001). This study verifies that on-the-go tourists with a passive mindset are often attracted by pass-by options, and attend to certain features such as ambiance and other consumers.

In other situations, where a mismatch between the travel plan or goal of the individual and the context occurs, tourists are likely to employ Pattern 3 processing. This kind of situation could happen if the tourist is exposed to contextual constraints (e.g. time budget, social input, and physical strength limitations, conflicting interest) that act as sources of the psychological stressor (Gifford, 2007; Wohlwill, 1974), making the achievement of a plan effortful. As such, the decision of canceling a plan can be regarded as a consequence of coping to the contextual stressor. Moreover, given the limited resources and multiple shifting goals defining the real-world decision contexts (Orasanu & Connolly, 1993), tourists tend to allocate their resources (e.g. time, money, physical strength) that best suits individual needs and interests. Thus, tourists may have to trade off one alternative to another or to determine which alternative is more important, removing the planned item with a lower value from the choice set. Furthermore, consistent with previous studies (Strack et al., 2006; Sherman et al., 2014; Strack et al., 2006), this study reveals the interactive, intervening relationships among different patterns or courses of operation for generating judgments and decisions. Tourists following Pattern 2 and Pattern 3 might be diverted into Pattern 1 to search for additional information to assist their evaluation and decision making.

NDM research has suggested that decision-makers employ situation-action matching decision rules that involve comparing against a standard without comparing options (Lipshitz et al., 2001). This study reveals that on-the-go tourists employ various heuristics or strategies for

decision making when applying the three information processing patterns. In this study, one common type is the so-called recognition heuristics. Tourists commonly make inferences based on a sense of recognition (i.e., previous knowledge or past experience) retrieved from memory, and therefore, they tend to select the famous tourism products or those they were familiar with. Social heuristics are also applied in decision making in motion especially when tourists have little knowledge about the product (Gigerenzer & Gaissmaier 2011). Other consumers in terms of the number, identity (e.g. whether they are local residents or tourists) and behaviour can be applied as clever cues that have a large influence on tourists' judgments and choices. Moreover, tourists often base decisions on the information collected from their social circle (personal recommendations) or word-of-mouth. According to the judge-adviser system of decision making, decision-makers who do not possess specialised knowledge need rely on input from expert advisors who are committed to promoting ideas that facilitate decisions (Zsambok & Klein, 1997). In this study, tourists' social networks and other tourists who are deemed knowledgeable and trustworthy exert strong influences on their decisions. Previous studies on tourists' information search also indicated that tourists highly rely on personal sources such as word-of-mouth from other tourists, friends, relatives, and service personnel during on-site decision making (DiPietro et al., 2007; Gitelson & Crompton, 1983; Guseman, 1981). Moreover, on-the-go tourists appear to focus on the most important cue (e.g. closest location), which forms the basis of further consideration, and then turn to other important cues or attributes (e.g., price, ambiance). This kind of decision strategies is similar to lexicographic heuristics (Gigerenzer & Gaissmaier 2011). The use of simplified heuristics can be explained by the fact that tourists generally lack time, skills, or the motivation to employee extensive processing (McCabe et al., 2015). The evidence of fast, affect-driven, and

simplified decision-making processes also suggests that some stages assumed in previous decision-making models may be omitted in the process of tourists' decision making in motion.

Although decision heuristics or strategies may be a good predictor of decisions, this study suggests that they should not be considered as the causes of the decisions; rather, they are the results of context-individual interaction in conjunction with the tourist's goals and values. The cues can be more or less favourable with respect to one's goals; the more favourable the cues, the more likely they are attended and used. Whether the alternative is selected or rejected is based on its congruence with the decision maker's contexts, goals, beliefs, and attitudes. Previous studies suggested that people adopt an adaptive toolbox of heuristics to solve decision problems in specific contexts (Marewski et al., 2010; Gigerenzer & Gaissmaier, 2011). The findings of this study highlight the importance of understanding tourists' multiple dimensional contexts and their relations with tourists in studying tourists' decision making.

This study reveals that tourists generally make four types of decisions regarding attractions and places, food and restaurants, shopping and purchase, and routes and transportation while on the move. Although previous studies have recognised the differences in the decision flexibility and adaptability (i.e., the rigidity of tourists' trip itineraries and the likelihood of altering planned items) across decision task types, they have rarely discussed the underlying structures and characteristics of tourists' decision making with respect to each type. In addition, previous studies were mostly conceptual work or followed a static approach based on hypothetical trip models. Following a qualitative research design, this empirical study depicts the processes of decision making in motion with respect to the four types of tourism products and services.

The decision task category revealed in this study is different from previous studies' findings regarding the hierarchy of tourists' decisions (Fesenmaier & Jeng, 2000; Jeng & Fesenmaier, 2002). According to the hierarchical framework proposed by Fesenmaier and Jeng (2000), tourists' on-site decision making involves *secondary decisions* that are made before departure but are subject to change, as well as *tertiary decisions* that are considered in the en-route or on-site phrase. In particular, the choices of activities and attractions are *secondary decisions* made before departure. However, this study notices that decisions about attractions and places can also be made after tourists arrive at the destination. Different findings may be attributed to the perceived ease of travel owing to ubiquitous Internet access and location-based smartphone services (Wang et al., 2012; Wang et al., 2014). This study provides empirical evidence that within today's technological information context, the structure of travel planning and decision making has been shifted in terms of flexibility, specificity, and time frame (Lamsfus et al., 2015), resulting in a new hierarchy of tourists' decision making.

Furthermore, previous models rarely discussed the effects of smartphones in the travel decision-making process. This study demonstrates that smartphones are widely used during tourists' decision making in motion and the use of smartphones can influence tourists' contexts and their information processing in a variety of ways. The framework provided by this study is the first that smartphones have been integrated into conceptual decision-making models. Thus, this study contributes to the literature by developing a framework that is more flexible to account for the complex, dynamic process of tourists' decision making in motion and relates more readily to current tourist behavior patterns during the era of mobile information technology.

6.5 Summary of the Chapter

This chapter discusses the findings of this study in the relevant literature in order to unveil the essence and general structure of the focal phenomenon (tourists' decision making in motion). The research questions guide the discussion of the main findings. First, this study sheds light upon the multi-dimensional context in which tourists in motion are immersed throughout the decision-making processes. Based on empirical results, a comprehensive context framework in travel and tourism settings is developed. This study demonstrates that tourists' decisions are determined by a range of factors within the seven dimensions of each decision context.

Second, this study provides a comprehensive, detailed description of tourists' decision making in motion by delineating what catches on-the-go tourists' attention, what circumstances they are under, how they process various information cues presented in different formats, and what kinds of rules or heuristics are applied by them to reach a decision. Based on the empirical results and further analysis, this study identifies three unique patterns of information processing strategies and processes employed by tourists while in motion. This study not only complements previous studies, which are mostly quantitative or conceptual but also provides a new way of accounting for tourists' information processing.

Third, the current study investigates the roles of smartphones during tourists' decision making in motion, which provides a big picture to explain the influence of ICT in the travel context. This study reveals the various use of smartphones by on-the-go tourists. Different use of smartphones frames the decision contexts and exerts an influence on tourists' information processing patterns during the processes of decision making in motion. The findings in this study demonstrate that smartphones have an influence on the processes of decision making in motion by

playing different roles in the three patterns of information processing. The unique roles of smartphones unveiled in this study echo previous research that discusses the features of smartphones that are valuable for on-the-go tourists and travel decision making (No & Kim, 2015; Huang et al., 2017; Anckar & D'incau, 2002).

Finally, based on the above discussion, this study provides a framework to describe how tourists make decisions in motion. The findings of the three elements (decision tasks, decision contexts, and individual information processing systems) and the relationships among them shed light upon the distinctive characteristics of tourists' decision making in motion. The main novelty of the framework is in highlighting the role of context-tourist interaction; in this way, the study is useful in describing the informal and unstructured processes of decision making. Furthermore, this time is the first that smartphones have been integrated into conceptual decision-making models. Overall, this study extends our knowledge about how tourists make decisions in dynamic destination contexts within today's ICT environment. The next chapter provides an overview of this study and discusses theoretical contributions and practical implications. In addition, this study's major limitations and suggestions for future research are discussed.

CHAPTER 7 CONCLUSION, LIMITATIONS, AND FURTHER RESEARCH

This research sought to understand the phenomenon of tourists' decision making in motion. This chapter summarises the research findings and examines the extent to which the research questions are answered. Then, the theoretical contributions and practical implications of this study are elaborated. Finally, limitations and future research directions are discussed.

7.1 Summary

As pointed out in the literature review, three fundamental problems are identified in conventional models of tourism decision making: rationality, the focus on input-output variables rather than cognitive processes, and the scope of tourism products or travel stages. Research is needed to promote knowledge development on tourism decision making and provide better predictive models of tourist actual behaviour within today's ICT context. This empirical study is among the first to qualitatively analyse tourists' decision making during trips in real-world settings. The study focuses on a particular type of decision making: decision making in motion, which has become increasingly prominent in travel. The present study seeks to examine the extent to which prior conceptual models are reflexive enough to account for tourists' decision making in motion.

Previous decision-making models have primarily conceptualised the sequential nature of tourists' decision making and highlighted a series of well-defined stages in the decision-making process (e.g. Woodside & Lysonski, 1989; Schmoll, 1977; Mayo & Jarvis, 1981; Crompton, 1992; Um & Crompton, 1990). In reality, affect, intuition, and other subjective factors along with various situation factors often drive tourists toward decisions that are made in different ways (McCabe et al., 2015). Since tourists' decision making involves different types of decisions at different stages, the sequence of stages proposed in those decision-making models may be varied within different

scenarios. Although researchers have started to recognise that tourists' decision making is an adaptive process with myriad contextual influences, previous studies provide little information about the underlying structure of the process. The investigation of tourists' decision making in motion with an emphasis on cognitive processes geared toward certain decision scenarios could contribute to theory development and address the fundamental issues.

This study describes tourists' decision making in motion by considering several aspects: tourists' perceptions of complex information spaces; the rules, heuristics, and themes embedded in tourists' decision-making processes; and the roles of smartphones in these processes. The findings of this study answered the three research questions. The first question concerned the contexts within which tourists' spontaneous decisions emerged while exploring a destination. Results show that on-the-go tourists' decisions about four types of tourism products and services (attractions and places, food and restaurants, shopping and purchases, and routes and transportation) emerged within seven contextual dimensions: servicescape, social, information, intrapersonal, geo-position, time, and weather. Dimensions of tourists' immediate contexts prompted their decision making in motion.

To answer the second question of how tourists process various information cues while in motion, the findings revealed three information processing patterns prompted by context-tourist interaction. Under certain circumstances, tourists actively sought and gathered information from various sources, processed that information, and then made decisions. Information processing could also be induced by passive information feeds while on the go. As tourists often made plans before their trips, tourists' decision making in motion also involved deciding to cancel planned activities. In this study, this pattern of information processing and decision making was often triggered by tourists' contextual constraints.

The third question considered tourists' smartphone use while on the move and how such use may affect tourists' decision making in motion. Smartphones appeared to play unique roles in tourists' decision making in motion. The empirical results demonstrated that tourists used various smartphone functions to acquire spatial knowledge, access real-time information, and maintain local and distant social networks. Smartphone use can influence decision making by playing different roles in the three patterns of information processing. The roles of smartphones in these patterns suggest the unique value of smartphones for tourists' decision making in motion. The findings provide a substantive understanding of the influence of smartphones on tourists' decision making.

Taking a holistic view to examine the phenomenon under investigation, this study addressed the fundamental research problem by providing a comprehensive framework to describe how tourists make decisions in motion. This framework filled up conceptual gaps as discussed in Chapter 3. Specifically, the framework provided detailed information about the three components of tourists' decision making in motion: on-the-go tourists' contexts, decision tasks, and individual information processing. The properties of each component were identified based on the empirical results, underpinned by the research paradigm. This study suggests that tourists' decision making in motion has distinctive features in that it a) reflects the characteristics of leisure tourism and independent tourists' pre-trip planning; b) involves a series of decisions regarding attractions and places, food and restaurants, shopping and purchases, and routes and transportation; c) is contingent upon various factors within the seven dimensions of a certain decision context; d) involves three kinds of context-driven information processing routes that are prompted by context-tourist interaction and can be influenced by smartphone use on the move.

7.2 Theoretical Contribution

Original ideas, theories, and methods of investigation can be considered as contributions to the knowledge (Easterby-Smith, Thorpe & Lowe, 1991). Tourists' decision making is important to consider in the management of tourist behaviours and experiences; satisfactory decisions are essential to effective tourism management (Moore et al., 2011). This study has investigated how tourists make decisions on the move within today's information technology environment. The findings contribute new knowledge about tourists' decision making and relevant methods of investigation.

The most significant contribution of this study involves the evaluation of an increasingly prominent phenomenon in travel and tourism with limited research: decision making in motion. These types of decisions differ from conventional decision making. This study illuminates several distinctive characteristics of tourists' decision making in motion. In response to a call for greater emphasis on 'process' models of tourists' decision making (Smallman & Moore, 2010), this study examines tourists' decision making in motion following a narrative-based approach. Results are based on tourists' discursive accounts of their decision-making processes. This approach can enhance understanding of the rules, heuristics, and themes embedded in tourists' naturalistic accounts. Results also reveal how these parameters can guide tourists' decisions and actions as well as the contexts in which these apply (Sirakaya et al., 1996; Moore, Smallman, Wilson, & Simmons, 2012). This theoretical approach offers advantages in developing a pragmatic framework for tourists' decision making that is "complex, defamiliarizing, rich in paradox" (DiMaggio, 1995, pp.391). This framework also helps to fill a gap in the tourism literature around tourists' decision making in motion.

Studies have found that tourists use different information sources and information processing strategies while on site compared with during pre-trip information searches (Van Raaij & Francken, 1984; Fodness & Murray, 1998). Yet many decision-making studies have focused on specific tourism products and travel stages. Empirical evidence in this study suggests that tourists' decision making is ubiquitous in destination settings. It is therefore important to examine tourists' decision making during trips. Many travellers make decisions in complex real-world environments without following the rigorous, rational cognitive processes assumed in classic decision-making models. These findings contribute to the tourism literature by advancing knowledge about tourists' on-site decision making. Relevant constraints include brief exposure to information cues; extensive information input; and influences of weather, time, and other social actors on various tourism products and services.

This study also responds to a call for more research focusing on the dynamic interactive process between individuals, decision tasks, environments, and decision strategies in natural settings (Lipshitz et al., 2001). Through the lens of NDM, this study has discovered how tourists make real-world decisions while in motion. This study advances NDM by focusing on non-expert decision makers. It also investigates decision making in contexts that have not been captured by NDM. Lastly, this study considers the influence of information technology on decision making, which NDM has not yet incorporated. Findings reveal that tourists' decision making in motion is not simply a decision outcome. It is a dynamic, evolving, interactive, and constant adjustment process reflecting several factors: individual- and trip-related characteristics, the structure of the task to be accomplished, and the on-site context of decisions to be made. Despite substantial evidence regarding the influences of contextual factors on tourists' decision-making processes (DiPietro et al., 2007; Fodness & Murray, 1998; Money & Crotts, 2003), decision-making research

has provided little information about the dynamics of tourists' decision-making contexts. The empirical findings in this study offer a holistic understanding of multidimensional contexts in tourism destinations. Results show that the contexts within which on-the-go tourists are immersed include seven dimensions: servicescape, social, information, intrapersonal, geo-position, time, and weather. This study suggests that tourists' decision making is contextually dependent; thus, it should be examined within specific contexts. The findings of this research provide a foundation for future work on tourists' contexts.

Tourists' information processes are crucial to understanding their decision making. This information processing depends on the quantity and quality of information available to and used by tourists and how tourists absorb, structure, and integrate information. Tourism research has widely discussed tourists' information acquisition and processing. Such studies have tended to focus on tourists' presumed rules or strategies to reach a choice among a set of alternatives with different attributes (Moore et al., 2012). This study probes tourists' information processing in naturalistic settings. Empirical findings of tourists' information sources and rules or strategies provide a comprehensive picture of tourists' information processing.

Smartphones are embedded in many facets of travel. Although studies have examined ICT and its relationship with decision making, as well as smartphone use in travel, the influences of smartphones on tourists' decision-making processes have rarely been addressed. Scholars have considered the impacts of smartphones on tourists' decision making (Lamsfus et al., 2015); however, to the best of the author's knowledge, no empirical study has focused on the specific roles of smartphones throughout the decision-making process. Research on the impacts of smartphones in travel has instead discussed the general influences of smartphones on tourists' experiences. The present study supplements such work by focusing on on-the-go tourists'

smartphone use and the extent to which smartphones affect their decision making. By collecting empirical data in real-world settings, the findings reveal tourists' diverse smartphone use while exploring a destination. A close examination of decision-making processes, including smartphone use on the move, unveils numerous roles of smartphones in influencing tourists' information processing and final decisions. This study advances the ICTs and tourism literature by integrating smartphones into tourists' decision-making frameworks. Results also offer a detailed explanation of the effects of smartphones on tourists' decision making.

Relative to "variance studies" of decision making (Smallman & Moore, 2010, p. 417), complex process studies appear less common in the tourism decision-making literature. This gap may be due to associated challenges in research methods. This study presents a new means of investigation in decision-making research by demonstrating that rich data can be rigorously generated through appropriate techniques. This study follows a qualitative research design to investigate tourists' actual decision making in a destination with a focus on rationality and irrationality (Smallman & Moore, 2010). The use of process-tracing techniques enabled the researcher to capture emergent actions and activities influencing tourists' decisions. Tourists' on-site activities and decision-making processes were digitally tracked and videotaped, revealing valuable information not disclosed in interviews. This study, therefore, uncovered varied approaches in tourists' decision making and the contexts in which these apply. Taking decision scenarios as the unit of analysis, the researcher identified variations across tourists' decision making by tracing decision steps in each scenario. Because the trustworthiness of qualitative results may be compromised by subjective interpretation, multiple forms of evidence were collected from several sources (i.e., wearable cameras, GPS data loggers, and pre- and post-trip interviews). Numerous data sources also offered opportunities for data triangulation to minimise

subjectivity and maximise study trustworthiness. The methods in this study clearly depict tourists' decision making in motion, which may not be accomplished through other means.

7.3 Practical Implications

This study's findings indicated that tourists make decisions before travel. They also revise pre-trip plans and make new decisions after arriving at their destination. Knowledge of how tourists make real-world decisions throughout a destination can help stakeholders such as restaurants, retailers, and destination management organisations better support tourists' decision making. Tourists are likely to make on-site decisions about four types of tourism products and services: attractions and places, food and restaurants, shopping and purchases, and routes and transportation. Therefore, businesses in these sectors can influence tourists' decision making. Many spontaneous needs and decisions emerge while tourists are exploring a destination. Tourists can check information anytime and anywhere, such as while travelling in a taxi, subway, or bus; while waiting for a table in a restaurant; or while taking a break in a coffee shop. Thus, destination marketers should offer ubiquitous information about tourism products. Tourists can also initiate decision-making processes anytime, especially in response to unexpected situations or constraints. A major challenge facing marketers is to present consumers with information that suits tourists' situational needs (Lamsfus et al., 2013). This study identified multiple contextual dimensions influencing on-the-go tourists' decision making. Tourist businesses should consider these dimensions when distributing information to raise consumers' perceptions and evaluations of products or brands.

This study also identified characteristics of tourists' decision making in motion in different scenarios. Results provide valuable information for tourism businesses. For instance, the large numbers of decisions made by on-the-go tourists regarding food and restaurants suggest that

tourists are highly flexible with such decisions, which is consistent with previous research (Park & Fesenmaier, 2014). On-the-go tourists are likely to rely on particular cues or heuristics (e.g., the presence of local consumers, restaurant atmosphere, or following crowds) to make choices about food and restaurants. Moreover, tourists tend to search for nearby restaurants or be attracted by pass-by restaurants. During this type of decision making in motion, tourists commonly take restaurant locations as a decision criterion. The findings suggest the importance of location selection and heuristic-based cues for restaurateurs to capture tourists' interest.

In attraction- and place-related decisions, smartphones were the most commonly used information source by tourists on the move. This trend indicates the importance of making attraction information available via smartphones. Furthermore, this type of decision making in motion is closely related to tourists' physical and time resources and attraction locations. On-the-go tourists are likely to skip planned attractions or places with remote, hard-to-reach attractions due to fixed time budgets. They also tend to visit unplanned attractions that are nearby, especially during downtime. These findings underscore the importance of accessibility in tourism attractions. Attraction marketers and managers should, therefore, strive to provide more information regarding transportation and operating hours to help tourists accomplish planned visits. Such information may also persuade tourists to visit who had not initially planned to do so. Tourism practitioners are also recommended to develop effective travel routes to attractions. These routes may help tourists make the best use of their time budgets and physical strength. Regarding shopping- and purchase-related decisions, tourists often have predetermined products or pre-existing knowledge or plans in mind before arrival. They commonly search for a specific shop or brand locations via smartphones. Moreover, tourists may be inspired by information cues (e.g., road signs) and then

recall previous knowledge about a shop, which can drive shopping and purchase decisions. These findings suggest the importance of such information sources in tourists' decision making.

The results of this study offer practical implications in the area of mobile marketing. The development of mobile technologies has promoted their ubiquity and flexibility in time and location. These characteristics, along with such devices' interactive nature (Okazaki, 2012), have increasingly convinced businesses to leverage mobile technologies in shaping tourists' judgments and decisions. Tourism businesses are doing the same; indeed, mobile marketing requires a profound understanding of tourists' behavioural patterns vis-à-vis smartphone use. The findings of this study revealed a positive association between smartphone use and tourists' decision making. Location-based services were found to enhance the effectiveness of information search behaviour and serve as navigation aids for tourists on the move, thus greatly influencing their decision making. This pattern demonstrates the importance of "provide specific, targeted geospatial information about users' surrounding environment, their proximity to other entities in space (such as people and places), and/or distant entities (e.g. next stops during trips)" (Okazaki, 2012, p.121). Tourism businesses are encouraged to capitalise on the power of context-aware technology to influence tourists' decisions. The study results also provide insight into the design of smartphone information services. Knowledge of the multidimensional contexts within which tourists are immersed during decision making offers a foundation for constructing effective mobile systems that offer innovative, customised recommendations based on tourists' contextual needs. This study found that tourists refer to social media to make decisions about restaurants, attractions, and shopping; therefore, tourism businesses should consider becoming more active on social media platforms. Tourists frequently use review apps to find restaurants and evaluate alternatives. Restaurants should thus pay attention to the management of these channels and incentivise

customer reviews. Furthermore, the findings of this study showed the effects of push alert functions in smartphone apps on tourists' decision making. Context awareness and push alerts should be incorporated into travel information services on smartphones to inform tourists' decisions.

7.4 Limitations and Future research

This study has several limitations that merit attention, namely involving the research methods and scope of research. As this study sought to provide a sound theoretical foundation of tourists' decision making in motion, the limitations do not necessarily impair its contributions. The following aspects were not of express interest in this study; however, they should be considered in future research to better contextualise decision making in motion.

The qualitative nature of this research involves some limitations. The aim of the study was to empirically investigate tourists' decision making in motion through various real-world scenarios. Qualitative methods were appropriate for examining tourists' contexts, information cues, information searches, and information processing behaviours in this type of decision making. Qualitative data were collected via process tracing and in-depth interviews. Interpretations of this research may be subjective. The researcher attempted to ensure the trustworthiness of the study in several ways (e.g., member checking, checks for inter-coder reliability, and adequate references) (Lincoln, & Guba, 1985). Future research could adopt quantitative techniques to test the identified variables and examine relationships between constructs.

This empirical study was conducted in a specific urban destination, Hong Kong. Tourists' experiences and decision-making processes in other destinations may differ. However, this research was not intended to be generalisable; the validity of results may be influenced by the study's design and scope. Scholars can replicate this type of study in other settings. Study

participants were selected based on several criteria. Underlying cognitive mechanisms and decision-making processes may be related to socialisation (Papathanassis & Knolle, 2011). To address this issue, this research included tourists with diverse cultural backgrounds (e.g., Eastern tourists from China, Taiwan, and Singapore; and Western tourists from Australia, New Zealand, Austria, the UK, France, and elsewhere). Half the participants were Chinese tourists; however, the research design was based on the main study purposes, and cultural influences were not a focal point. The 30 participants provided rich insights into the phenomenon of interest. The findings imply a behavioural distinction between Eastern and Western tourists. Even so, the study cannot fully describe cultural differences in individuals' decision-making processes. Future research should, therefore, consider sociocultural variables (e.g., social norms, individualism vs. collectivism, and risk aversion) when conducting cross-cultural comparisons.

Research has suggested that tourists' decision making is influenced by individual and trip characteristics (Hwang & Fesenmaier, 2011; Hwang, 2010; Schunn & Reder, 2001; Lee & Crompton, 1992). As such, tourists' demographics (e.g., age, occupation, and education) and trip characteristics (e.g., travel purposes, multiple destinations, and travel frequency) may influence decision making in motion. Although this study attempted to collect and analyse relevant data, there is insufficient evidence to demonstrate how these variables affected tourists' decision making. This study was intended for exploration rather than prediction. Besides the variables proposed in this study, researchers could explore other antecedents related to decision making in motion. Examples include tourists' expectations about their trips, prior knowledge of their destination, personal involvement, travel distance, and length of stay. Studies have revealed individual differences in decision-making flexibility, which may account for variations in travel-related decision making. For example, Lee and Crompton (1992) identified novelty as an influential factor

behind destination choices. Novelty-seeking tourists often prefer unusual, adventurous vacation experiences. These experiences provide a change of pace, surprise, and excitement. By comparison, novelty-avoiding tourists tend to prefer familiar, planned travel experiences. An interesting avenue for future research would be to investigate the extent to which tourists' internal traits (e.g., openness to change, creativity, novelty seeking, and curiosity) affect decision making in motion.

Finally, the study focused on on-the-go tourists' smartphone use to understand the roles of smartphones during decision making in motion. However, smartphone use during travel may be shaped by tourists' prior use and antecedents of future use (Wang et al., 2016). Everyday smartphone use may alter tourists' approaches to communication and information consumption; by extension, their smartphone use for travel-related decision making could change as well. Therefore, subsequent studies should consider the relationship between smartphone use in tourists' everyday lives and decision making on the move. Results could lead to a clearer understanding of the roles of smartphones in decision making in motion. Furthermore, tourists' use of smartphones during current trips may influence smartphone use during future trips. Subsequent research could adopt a longitudinal perspective to explore interactions between tourists' daily smartphone use and decision making in motion as well as influences on future travel planning and decision making. This study also considered non-smartphone use and constraints around using smartphones for decision making in motion. However, findings provided limited information about factors supporting or inhibiting smartphone use during decision making in motion. Future studies should examine mechanisms behind smartphone use and non-use during tourists' decision making in motion.

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APPENDIX I CONCENT FORM

INFORMATION SHEET
Conceptualizing decision-making in motion

You are invited to participate on a study conducted by Dr. Dan Wang, who is a staff member of the School of Hotel and Tourism Management in The Hong Kong Polytechnic University. The project has been approved by the Human Subjects Ethics Sub-committee (HSESC) (or its Delegate) of The Hong Kong Polytechnic University (HSESC Reference Number: XXX).

The aim of this study is to a) to describe the contexts of decision-making in motion (i.e., how spontaneous decisions emerge while tourists stroll through an urban information space), b) to identify the information-processing strategies (i.e., the order of processing different information cues, the processing of information presented in different formats, and the mediation of mobile technology); and c) to analyze the interactions and relationships of the factors (e.g., information cues, social input, online information sources) that contribute to decision-making processes when tourists are in motion.

The study will involve the following four steps.

- First, you will be invited to participate in the study by recording one of your days in which you travel around the Hong Kong city (e.g., a city tour by yourself). You will be required to use GPS recorder to record your geographic movement.
- Second, in order to capture the information cues and information spaces that tourists experience, you will be asked to use wearable camera to capture the information space you go through.
- Third, you will be asked to speak out your thoughts when you strolling around the city during your day trip, and these thoughts and discussions with travel companions will be audio recorded by the wearable camera.
- Fourth, after your day trip, you will be invited to participate in an after-trip interview for exploring and clarifying the process of decision making in motion based on the researcher's observation and the process tracking data, which may take your one hour.

The participation should not result in any undue discomfort. All information related to you will remain confidential, and will be identifiable by codes only known to the researcher. You have every right to withdrawn from the study before or during the process without penalty of any kind. The whole investigation will take about one day (eight to ten hours).

If you would like to get more information about this study, please contact the following staff.

- Dr. Dan Wang on tel. no. (852)3400 ; mailing address (17 Science Museum Road, Hong Kong) and email address: d.wang@ .
- Miss. Xuerui Liu on tel. no. (852)9713 ; mailing address (17 Science Museum Road, Hong Kong) and email address: xuerui.liu@ .

If you have any complaints about the conduct of this research study, please do not hesitate to contact Miss Cherrie Mok, Secretary of the Human Subjects Ethics Sub-Committee

of The Hong Kong Polytechnic University in writing (c/o Research Office of the University) stating clearly the responsible person and department of this study. Thank you for your interest in participating in this study.

Dr. Dan Wang
Principal Investigator/Chief Investigator

Miss. Xuerui Liu
Ph.D. Student

CONSENT TO PARTICIPATE IN RESEARCH
Conceptualizing decision-making in motion

I _____ hereby consent to participate in the captioned research conducted by Dr. Dan Wang／Miss Xuerui Liu.

I understand that information obtained from this research may be used in future research and published. However, my right to privacy will be retained, i.e. my personal details will not be revealed.

The procedure as set out in the attached information sheet has been fully explained. I understand the benefit and risks involved. My participation in the project is voluntary.

I acknowledge that I have the right to question any part of the procedure and can withdraw at any time without penalty of any kind.

Name of participant _____

Signature of participant _____

Name of researcher _____

Signature of researcher _____

Date _____

Hung Hom Kowloon Hong Kong 香港 九龍 紅磡

Tel 電話 (852) 2766 5111 Fax 傳真 (852) 2784 3374

Email 電郵 polyu@polyu.edu.hk

Website 網址 www.polyu.edu.hk

APPENDIX II INTEVIEW GUIDES

A. Pre-Trip Interview Protocol

1. An overview of the following

1.1. Trip characteristics:

1.1.1. Where do you come from?

1.1.2. How long is your whole trip? How many days will you stay in Hong Kong?

1.1.3. How many places are you going to visit?

1.1.4. Who are you going with during this trip?

1.1.5. Is this your first-time to visit Hong Kong?

1.1.6. What is your main purpose or motivation for this trip?

1.1.7. May I ask your budget for this trip?

1.2. Traveller characteristics:

1.2.1. How many leisure trips do you normally take per year?

1.2.2. Do you prefer independent tour or packed tour?

1.2.3. Do you prefer domestic travel or overseas travel?

1.3. Trip planning characteristics:

1.3.1. How is your plan for the whole trip?

1.3.2. How did you plan your trip?

1.3.3. When did you start to plan your trip?

1.3.4. How much your plan can be flexible?

2. The overall goal of this day-trip

2.1. Behaviour expectation:

2.1.1. What is your overall expectation of today?

2.2. Behaviour intention:

2.2.1. What do you intend to do during the day?

2.2.2. How many goals are you going to achieve today?

3. The plan of the day

3.1. General plan

3.1.1. Do you have a plan for today?

3.1.2. How is your plan of today?

3.2. Specific plan

3.2.1. Where do you plan to go? And when?

3.2.2. What do you plan to do in each place?

3.3. Advance planning

3.3.1. When did you make this plan?

3.3.2. Why did you plan to go to/do this?

3.4. How flexible it can be

3.4.1. Do you think that you will follow your plan?

3.4.2. Will you go to those places according to your plan?

4. The use of smartphone in daily life

4.1. How long have you been using smartphone?

4.2. What are the main functions you use in your daily life?

4.3. How do you think the use of smartphone change your daily routines? In a good way or a bad way?

4.4. How much do you rely on your smartphone?

4.5. If using a metaphor of person, you will say smartphone is?

B. After-Trip Interview Protocol

1. General question

1.1. How is your day?

2. Identification of decision making in motion (Mapping & Timeline)

2.1. Starting with a reflection of the day activities.

2.1.1. When did you leave the hotel?

2.1.2. Where did you go? Where was your first stop after you left the hotel?

2.2.3. Was that in your original plan?

2.2.4. Why did you change your plan?

2.2. Probing into each decision making scenario

2.2.1. Detailed context

I. Have you heard there before?

II. Why did you want to go to that place? What attracted you?

III. How did you get there? (transportation mode)

IV. How did you find a way to get there? (route)

V. When did you arrive there? How long did it take to find the place?

VI. What did you do there?

2.2.2. Information landscape

I. Could you please describe the circumstance that you were under?

II. What appeared in your eyes first?

III. Did you see any information cues that inspired your idea to?

IV. Which type of format did the information present?

2.2.3. Decision making process/criteria/heuristics

I. What was your initial idea?

II. How many choices did you have?

III. What was the opinion of other people in your group?

IV. Who came up with this idea first?

How did you think about this idea when you first heard that? (group discussion details)

V. How did you make up your mind to?

VI. Why did you decide to go/ do this instead of? (decision criteria)

VII. Were you inspired by any other external factors including personal and situational stimuli?

VIII. Were there any unexpected restrictions? (e. g. time, weather, physical, budget, etc.)

IX. How long did it take to make your final decision?

X. How about your experience?

XI. Was that the same as your expectation?

XII. How did you feel about this decision?

2.2.4. Classification of the behaviours

I. Did you make this decision due to emotional appeal or functional factors?

II. Would you say that was an impulsive maybe even irrational decision or one after your serious consideration?

III. Did you have any knowledge of that before? / Have you heard about that? / How familiar you were with it?

IV. Did you have an expectation or intention in your mind but reaching a purchase subject to conditions at the store such as a special offer?

V. Did you have a plan to buy a product or a specific brand?

2.2.5. The mediation of smartphone

I. Did you use smartphone during this decision-making process? And how?

II. Why did you use smartphone or not?

2.2.6. Analysis

I. How did a certain unplanned behaviour influence the rest of the day?

2.2.7. Why did not you do as you planned?

2.2.8. How did you feel about this unplanned behaviour?

3. The use of smartphone during the day trip

3.1. What were the main functions you use the smartphone during the day?

3.2. A list of functions

3.2.1. When and where did you use your smartphone during the whole day?

3.2.2. What was the result? What did you get from smartphone?

3.2.3. Why did you turn to smartphone at that time?

3.2.4. Did smartphone contribute to your decision-making?

3.2.5. What type of decisions you made were assisted by smartphone?

3.2.6. How would you describe the role of smartphone in your day trip?

3.3. Feeling about unplanned behaviour

3.3.1. How do you feel about your unplanned stops such as?

3.3.2. How do you think of your unplanned skips such as?

APPENDIX III SAMPLE OF MEMOS (PARTICIPANT #13)

UK
HK.
3, ~~8~~ days 13 ~~nights~~ 16
Today: Stanley, Peak
Tomorrow: cycle around, Lantau Island
see HK, read a book
15000 pounds.
a friend in HK dental schod
Winter + summer trips / per year
Wife: ~~travel~~ firm, main planner
3,4 times hotel, airport commission
book the flight, hotel
Start with a concept.
from Internet & networks of friends
Lonely Planet, read a little bit, guidebook
Trip Adviser not reliable
January, 6 months ago, hotel & flight 4 months ago.
Everyday has a plan but can be changed.
This morning, raining, changed the plan ~~of~~ Peak
to the afternoon

1940s, wars taken place in Stanley. (Imagination)
Peak, race trek
dentist

Wanted to see places in the book

① ferry cross the sea. Wanchai

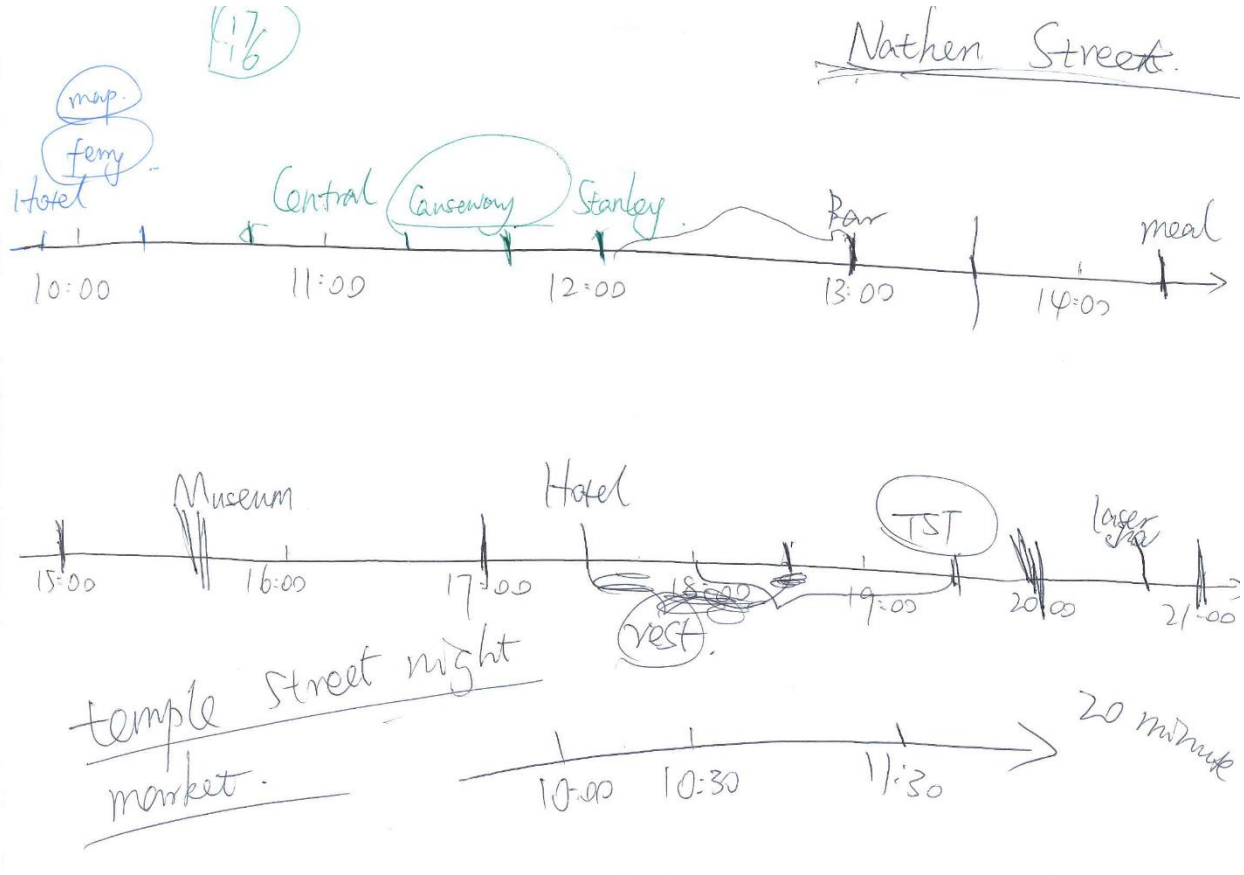
② train / bus / taxi to Stanley. get the snack.
not sure.

③ afternoon the Peak walk around
not sure about the transportant

wife looked at several restaurants but decide in the day
8:00 Laser show, eat afterwards

Choice criteria: based on people's suggestion.
random
Gennerally follow the plan. may change a little bit

10 years
telephone & Internet (email, information, job website
map sometimes)


(17/6)
Nathen Street
map
ferry
Hotel
Central
Causeway
Stanley
Par
meal
10:00
11:00
12:00
13:00
14:00
Museum
Hotel
TST
laser
15:00
16:00
17:00
18:00
19:00
20:00
21:00
rest
temple street night market
10:00
10:30
11:30
20 minute