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Unravelling the Location-based Information Sharing on Social Media among Various Contexts: from a Dual-process Perspective

By

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Abstract

With the flourish of mobile network technologies, the utilization of related tools in providing services to users has become an emerging topic in recent studies in information systems. And as one of the most iconic contents within these services, location-based information has been attached with great importance in its effectiveness in facilitating communication, promoting business activities, and drawing attention from users. Given the success of location-based information in supporting many well-known services like Foursquare and Dianping.com, numerous past studies have investigated the factors that drive individuals to share related content with others. However, these past studies mostly assume that sharing such information is solely driven by the rational process and without any considerations from the affective system. Instead, with the foundation of place attachment theory, this thesis has provided an alternative framework from the perspective of behaviour-level dual-process model to test the interactions between impulsive and reflective processing on the sharing behaviour of location-based information. Besides, since the environment of communication has been dramatically reformed in the mobile network, the decision toward information sharing will be largely primarily influenced by the context at the moment. Thus, it is worthwhile to take a closer look at what contexts existed in location-based information sharing and investigate their effects in manipulating the perception and behaviours of individuals. Therefore, by adopting a mixed-method approach, this thesis firstly conducts a qualitative study to explore the concept of contexts for location-based information on social media. Then, based on the findings from the qualitative research, a research framework is proposed and examined to verify the mechanisms of two processing systems under various contexts.

Consequently, the forms of components in the context for location-based information are updated, and a structure that consists of two dimensions (i.e., social and physical context) and four perspectives (i.e., egoism vs. collectivism and distinctiveness vs. connectedness) is constructed. Lastly, the hypotheses are tested and discussed according to different contexts by conducting the scenario-based survey under various contexts for location-based information. This thesis

has confirmed that individuals utilize the dual-process model in deciding whether to share location-based information. The interactions between the two processing systems will be influenced by the exact context at the moment of sharing. It also provides insights for practitioners to consider the influence of contexts. The service providers of location-based information could utilize the findings to design a better system in destination design, facilitating information sharing, and content recommendation.

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Chapter 1 Introduction

The topic of this thesis is Location-based Information Sharing (LBIS) on social media. This chapter begins by presenting a general introduction to the background of the research, and then introduces the motivation for conducting the research, followed by a discussion of research questions and objectives. Finally, it highlights the potential contribution of the research and concludes with a description of the structure and organisation of this thesis.

1.1 Background

The proliferation of mobile-based applications have initialized an evolution in people's virtual life, social media and platforms have invested significant efforts in motivating and facilitating users to share their everyday lives, comments, and emotions online with multi-modal information (Mehrotra *et al.*, 2017). Given the nature of the mobile network, it contains a considerable amount of potential valuable user-related data for business opportunities. And among all available contents, the location-based information, which is defined as the information that is locative or related to specific locations (Schiller and Voisard, 2004), has attracted a sizable attention from practitioners. Firstly, in the domain of tourism, the location-based information has become the key strategy in shaping destination image and attracting attentions (i Agustí, 2018). The content created and shared by users about destinations are shown to have higher trustworthiness and attractiveness than normal marketing materials, and leads to positive outcomes in marketing purposes (Mak, 2017). Recently, this trending has been further infused into users' daily lives, and shows excellent impacts in nearby destination recommendations through locative services (Wilken, 2014). Numerous applications, such as Foursquare [2] and Dianping [3], have been developed around the location-based information and has achieved great commercial successes (Zhang *et al.*, 2018). Besides, for marketers, location-based information is vital in distributing advertisements precisely and wisely.

[2] https://foursquare.com/

[3] http://www.dianping.com/

For example, the advertisers may push some notifications about the local services to users based on their address on the profile (Luo *et al.*, 2014). The advantage of location-based information in resolving the desynchronization problem between the time and location could provide accurate insights about individuals for on-site experience. Statistically, Foursquare, one of the most popular location-based platforms, has more than 50 million people who are active every month, and still shows a tremendous vitality with 70% of the total 95 million venues were updated in 2020 (GISuser, 2021). The value of location-based information were also recognized by US marketers that 48% of them agreed that location-based information use yields higher performance, and location-targeted advertisement could earn an average return on investment of 2500% on Foursquare (Foursquare, 2021a).

Moreover, the power of location-based information has been amplified by the growth of social media, related functions are widely integrated into routine usages. Social media giants like Twitter[4], Facebook[5], and WeChat[6] are powered by location-based technologies to provide geo-tagging functionalities for their users, and the API provided by Foursquare is used by more than 125,000 developers worldwide in designing social services (Foursquare, 2021b). The capability of location-based information in supporting social activities online accelerated its diffusion among platforms (Rizwan and Wan, 2018), even Foursquare has launched its own "social network" part, Swarm[7], in 2014.

As the core functionality of most social media platforms, the sharing behaviour of information, especially location-based contents, has been studied extensively in the academic field. To fully exploit the potential business value of location-based information sharing, many studies have investigated topics around its pattern (Trasarti *et al.*, 2017; Wu *et al.*, 2018), diffusion (Wisniewski *et al.*, 2020; Lim *et al.*, 2021), and outcomes (Pagani and Malacarne, 2017). Compared with other general information on social media, location-based information is

[4] https://twitter.com/

[5] https://www.facebook.com/

[6] https://www.wechat.com/

[7] https://www.swarmapp.com/

believed to possess a peculiar fascination by providing clear traces of individual's mobility, based on which applications and platforms could offer recommendations that suit users' needs (Yao *et al.*, 2018). With the help of huge volume of data on social media, recent studies have built various models with advanced machine learning technique in user profiling (Trasarti *et al.*, 2017), next-destination prediction (Noulas *et al.*, 2012), and recommendation for friends and local services (Yao *et al.*, 2018). Moreover, other studies investigated the consequence of location-based information sharing, including the visiting activities (Qiu *et al.*, 2018), tourism information adoption (i Agustí, 2018; Lim *et al.*, 2021), and network effects among users in information sharing (Pagani and Malacarne, 2017; Qiu *et al.*, 2018). For example, Qiu *et al.* (2018) found there is a strong observational learning effect between individuals and their friends in location-based information sharing behaviours. Similarly, the location-based information sharing are also found to be positively related to tourist attractions visiting (Zheng *et al.*, 2017), adding value to destinations (Zhang *et al.*, 2019), and facilitating offline interactions (Liu *et al.*, 2019a). In addition, apart from these streams of related research, most of the related literature paid intensive attention on why and how individuals share location-based information on social media.

Knowing what motivates users sharing location-based information on social media is essential for platforms to maintain the number of active users (Kim, 2016; Qiu *et al.*, 2018). In the early exploration of location-based information sharing, most studies adopted mature theories and models from traditional information sharing areas to test their validity for this emerging information (Barkhuus *et al.*, 2008; Li and Chen, 2010; Tang *et al.*, 2010). And among these models, some common factors have been considered and examined. The benefits received by users have been framed into different categories based on the methods, aims, and forms. Firstly, one of the most widely accepted incentives for users are monetary returns (Munar and Jacobsen, 2014). Users could trade their sharing of related information, especially the ones with locations, for coupons, discounts, and promotion activities provided by merchants. Besides, the intangible incentives are also important factors that users may consider during the sharing of location. For example, the reputation, attention, and

anticipated appreciations from other users are also strong predictors for the location-based information sharing (Rid *et al.*, 2014). Moreover, the motivation does not solely come from the external environment, the internal consideration often plays the key role in processing and manipulating the information and making decisions (Dawkins *et al.*, 2017; Scannell and Gifford, 2017b; Raymond *et al.*, 2017). Some users may share the location-based information because they are bored and just want to have fun, others may also decide to share because they had a good time at the place (Park and Fesenmaier, 2014; Kang and Namkung, 2016). Despite the success of these studies in explaining user behaviours under specific situations, the validity and generalizability of them have been challenged by the conflicted findings in recent studies. Specifically, the effects of various factors in location-based information sharing are not consistent among different studies (Fusco *et al.*, 2010). Depending on the aim of sharing and characteristics of platform, factors like trust, social benefits, and utilitarian benefits have presented varied relationships with the sharing behaviour. For example, Kim (2016) found distinctions in check-in motivations between users and non-users; Tang *et al.* (2010) also revealed that the social- and purpose-driven sharing of location-based information lead to different perceptions and behaviours. Furthermore, contextual factors, such as time limits, attitudes, and heuristic cues, are gradually included in recent location-based information studies, acting as both the moderator of direct influences (Clitheroe Jr *et al.*, 1998), or an alternative processing route in decision-making processes (Lamsfus *et al.*, 2015). These studies believe that contextual factors could impose significant influences on the general consideration of sharing behaviour, either by strengthening/weakening the direct influences, or overriding the previous processing system with an impulsive/heuristic decision. Consequently, some commonly used models like Elaboration Likelihood Model and Heuristic-Systematic Model are adopted to study the differences between different situations.

Also, privacy, as a critical factor that differentiates location-based information with other types of content, has been examined extensively to test its effects on individual's sharing behaviour (Tsai *et al.*, 2010; Riboni *et al.*, 2011; Sun *et al.*, 2015; Kim, 2016). This indicates that location-based information is deemed to

pose higher level of privacy concerns on individuals. The cause of this phenomenon may be the exposure of location-based information will somewhat reveal personal information to others, which breaks the assumption that personal identity is normally hidden under previous Internet environment (Twigger-Ross *et al.*, 2003; Gauntlett, 2008). These studies found privacy-related factors can effectively hinder individuals from sharing location-based information, which confirms the importance of privacy in this research domain. Undoubtedly, these characteristics have made the privacy-related factors the most controversial factor within this discussion. It is found in past studies that although people tend to express serious concerns about privacy-related behaviours, most users still do not care and continue disclosing their information online (Norberg *et al.*, 2007). This phenomenon is termed as privacy paradox (Norberg *et al.*, 2007), and the gap between expressed intention and actual behaviour indicates a need for further investigations on its causes. One possible explanation is the bias that individuals will experience during the sharing. For example, Knijnenburg *et al.* (2017) have summarized the shortcomings of privacy-focused models, and discussed the influence of multiple cognitive biases on individual's intentions and behaviours. Besides, since users are increasingly sharing their temporal feelings and emotions with compact contents, the time spent on making sharing decisions has been greatly shortened (Mills *et al.*, 2014). Accordingly, the main drivers of sharing behaviour will also be affected by on-site experience and situation (Wang *et al.*, 2016).

Besides the above-discussed factors, recent studies have paid increasing attention on the value added to the location-based content, especially from the consideration of social perspectives. From the study of Tang *et al.* (2010), the value of information in supporting social activities has become an indispensable part in location-based information sharing studies. The immediacy of sharing on mobile devices has created new stages for interpersonal interactions, individuals will consider both online and offline issues when share information online, and it also facilitates remote interactions with on-site experiences. Thus, by interviewing users on Foursquare, Cramer *et al.* (2011) and Lindqvist *et al.* (2011) concluded the accepted social norms about location-based information communication, and how it differentiates locative contents between other

information in terms of aims, methods, and conflicts. The results show that there exists a mutual effect between the online and offline aspect of the location. The sharing behaviour (i.e., check-in to places) will be affected by offline characteristics of the location, and correspondingly, the offline perception of locations will be modified with online interactions. Furthermore, the sharing of location-based information is also valuable in providing social advantages for individuals through the affiliation with specific places (e.g., mayorship on Foursquare), especially on impression management and interactions facilitation. In the following studies, Guha and Birnholtz (2013) discussed the impact of location-based information on impression management on social media, and found that visibility, popularity, and relationship could largely influence the sharing decision. Subsequent studies have extended the role of location-based information in social media, and consider it as part of the personal identity online (Schwartz and Halegoua, 2015; Sun *et al.*, 2015). These studies have enriched the scope of location-based information sharing drivers, and included diverse perspectives into discussion with factors like sense of belonging (Hochschild Jr, 2010), self-esteem (Wang and Xu, 2015), and reputation (Kim, 2016), etc. These newly identified factors have enriched the scope of discussion in related studies and challenged the static nature of decision-making processes for location-based information sharing. By incorporating the investigation of contextual factors into consideration, the complexity in understanding the sharing behaviour of location-based information has been regarded as the main impediment in unifying the past findings.

To sum up, the mechanism behind location-based information sharing seems rather dynamic under different situations, the motivations, inhibited factors, and processed related to decision-making need to be further investigated under different contexts. Despite existing studies of the relationships among location-based information sharing motivations, sharing situations, and decision-making processes, empirical studies on how context could modify the relationship in this area remain scant (Lamsfus *et al.*, 2015). Although past studies have provided insights with enough findings on factor effects under various contexts, a comprehensive and empirically grounded framework of the influence of contexts on the sharing decisions and subsequent behaviours is currently missing

from the literature. Such framework is important because it updates existing knowledge on the decision-making processes that drive location-based information sharing behaviour, most of which was established before considering the importance of sharing contexts on individual's perceptions and cognitions.

1.2 Problem Statement and Research Motivation

1.2.1 Contextual Factors and Location-based Information

The sharing of location-based information involves the interaction with both online and offline perceptions of the locative environment, which is comprised of multiple physical and social objects as well as substantial experiential and affective factors (Papangelis *et al.*, 2020). The sharing behaviour of any location-based contents associates with spatial-temporal characteristics and reflects a specific environmental setting (Grinberger and Shoval, 2019). Individuals' relationships and interactions with the dynamic location environment are, thus, fundamental to understanding the complexity of behaviour related to location-based information. Previous literature generally suggests that contextual influences on individuals' behaviours originate from physical (e.g., geographical location, ambiance, decor, weather), and social (e.g., interpersonal interactions) aspects of the context, especially within the social media environment (Tombs and McColl-Kennedy, 2003).

In past environmental psychology studies, 'context' is interpreted as the specific interdependence among personal, physical, and social-cultural aspects of environments, behaviour settings, and/or situations (Clitheroe Jr *et al.*, 1998). Prompts from the social or physical components of the context, or an array of extra-contextual sources (e.g., the Internet or popular media), can initiate a psychological and/or behavioural process, resulting in intended or unintended outcomes (Clitheroe Jr *et al.*, 1998). As such, the processes by which individuals interpret, assess, and comprehend aspects of their immediate contexts can lead to a range of cognitions, emotions, perceptions, and feelings, and trigger various information needs and decision-making processes.

Location-based information, as a kind of information mediated through mobile devices, its effect and interpretation are shaped by the ability of channels in

reflecting the intended content that users want to share. Past studies identified that people's perceptions of place, distance, sociality, and sense-making are greatly influenced by the mediation (Frith, 2014; Saker, 2017). Especially, the popularity of mobile services have been found to affect people's perceptions of place, distance, and meanings of locations (Gay, 2009; Walsh *et al.*, 2011). The mobile devices encourages the user's exploration of nearby locations and influences the decision-making process by offering not only easy access to information but also more relevant information through context-awareness (Lamsfus *et al.*, 2015). As a result, various decisions and unplanned behaviours are likely to occur regarding location-based information under different contexts.

Examples could be found in past tourism studies, which is probably the most dominant area that focuses on location-based information sharing. Tourism decision-making literature suggests that pre-trip and on-site decision-making follow different processes (Hyde, 2008). On-site decision-making is far more complicated and dynamic than pre-trip decision making, contributing to unplanned, hedonic, opportunistic, and impulsive characteristics in information processing (Hyde, 2008). Previous studies have argued that the on-site behaviour of individuals are adaptive and vary depending on contingency factors such as environmental and informational factors (Becken and Wilson, 2007), individual's socio-demographics (Baym, 2015), psychological factors (e.g. purpose of visit, previous relationship with the destination, motives) (Rid *et al.*, 2014), time-space constraints (Grinberger and Shoval, 2019), and the spatial layout of the destination (Lew and McKercher, 2006). Moreover, recent studies also argue that the inclusion of mobile devices is another factor that needs to be considered when trying to understand context-related behaviours, especially under social media environment.

However, despite the importance of and an increasing call for the investigation of contextual factors on how they affect individual's behaviours in information sharing, related studies are still scarce in examining their influences from a holistic approach. The most common practice that past studies adopted tends to focus on single variables as the proxy of the so-called context-related factor, and examples could be found in these studies including the role conflicts (Liu *et al.*, 2019b), immediate gratification (Lee and Ma, 2012), and habits (Lee and Ma,

2012), etc. For one thing, although these studies have confirmed the significant influences of these factors on manipulating individual's behaviour, there still lacks an in-depth discussion on how these factors are formed, reshaped, and linked with exact information, especially in the context of location-based information. The conceptualizations of related factors are mostly proposed through the lens of individuals themselves without a clear linkage of the context about locations, which further lead to an ignorance of how different locational contents are associated with, or even triggered the perception of these senses during the information sharing. Consequently, it leaves a theoretical gap about the role of location-based information in constructing, triggering, and manipulating individual's perceptions, and further affect the sharing behaviour of related contents. Moreover, this theoretical gap also poses serious challenge for practitioners. Although the existing findings can tell them some context-related factors could positively drive people to share location-based information, due to the lack of knowledge about what really triggers these factors, they still cannot identify the appropriate content to present to their users in achieving the pre-set goals.

Secondly, although limited discussions have been observed in location-based information sharing literature about the influence of contextual factors and environments, there still lacks an identification of key aspects and dimensions with this concept. With the initial explorations about communication norms (Cramer *et al.*, 2011), performative behaviours (Larsen, 2010), and travel experience expressions (Kim and Fesenmaier, 2017), etc., several salient factors have been discovered from the behavioural and perceptual perspective of individual's information sharing activities. However, these factors are generally too random to be summarized into any theoretical forms. Specifically, due to the different interpretations about individual's perception and lack of discussion about the intersection of different factors, the investigation of its effects is hard to proceed without a framework to structure the aspects in a contextualized environment. This gap, then, will both limit the further discussion of contextual factors with quantitative methods about the combined influences of varied factors, but also restricts the practitioners in developing knowledge and characteristics of specific contexts. Hence, this thesis aims to provide an

additional exploration about the contextual factors in location-based information sharing, and examine the influences of varied environment on manipulating individual's perceptions and behaviours.

1.2.2 Dual-process Models in Location-based Information Sharing

Besides, there is a clear distinction between two types of included factors in past studies about location-based information sharing (Bock *et al.*, 2005; Hur *et al.*, 2017). The first set is in line with the factors that are commonly seen in traditional information sharing literature, which includes the rationally anticipated benefits of the behaviour, such as social, utilitarian, and emotional benefits, etc. The second set, which is mainly comprised of psychological reflections and shortcuts, illustrates the unconscious part of decision-making processes for the location-based information sharing. Since previous studies have suggested that the sharing of information through mobile devices has distinct characteristics such as short decision-making time frame, limited problem solving, low involvement, and last-minute spontaneous behaviours, thus, the impulsive route of information processing which involves overlapping and bypassing of normal evaluations will be more salient than traditional models of consumer behaviour (Hyde, 2008). Hence, these features provided a perfect foundation for the examination of dual-process models. Specifically, related models such as Elaboration Likelihood Model (ELM) (Petty and Cacioppo, 1986) and Heuristic Systematic Model (HSM) (Chaiken, 1980), are extensively used in framing the individual's psychological considerations during information processing (Dhar and Gorlin, 2013; Ou *et al.*, 2016; Liu *et al.*, 2019b; Wang *et al.*, 2019). Still, these studies were conveyed either without a clear consideration of the originality in constructing the two processing systems, or staying on the level of persuasion and fails to explain the final behaviour of users. Therefore, it calls for following research to focus on the construction of two processing systems from the perspective of location-related contexts, and discuss their influences across different situations on the level of behavioural manipulations. Especially, since both ELM and HSM are believed as models on the persuasion level, the applicability of results obtained from studies with them are highly limited, and past studies have found many gaps between the expressed intention and actual behaviours. Thus, the discussion on how the two systems

jointly affect the individual's behaviour in the location-based information sharing context is undoubtedly needed to fill this gap between the persuasion to the final behaviour.

Moreover, past theories related to dual-process models mostly take the assumption that the weight and relative importance between the two processing routes are pre-determined based on individual's personality and preference, which is rather stable for individuals in making decisions (Pennycook, 2017; Liu *et al.*, 2019b). Similarly, this assumption has also been adopted in past studies by implicitly proposing that the influences of antecedents of processing systems follow a stable style in contributing to the consideration from both rational and impulsive perspectives (Evans and Stanovich, 2013; Watts, 2015). However, these implicitly expressed assumptions about dual-process models have been challenged in recent findings of location-based information sharing literature, especially under the discussion of contextual factors.

For the former assumption about the relative dominance of two processing systems, it is argued that even for the same person, the individual's attitude and actual behaviour towards the location-based information sharing will vary based on the meaning, timing, and audience of the sharing behaviour (Lamsfus *et al.*, 2015). For example, it is possible that individuals will have a systematic consideration of consequences if they want to share an entertainment place on a work-related platform on weekdays, but they will also share the same content without hesitation within the private circle on weekends. Besides, the lack of discussion on the dynamic of relative dominance of competing systems also generate fierce debates on the ambiguous outcomes regarding particular factors.

For example, although the privacy concern was proved to be a significant factor which negatively affect the sharing of location-based information in Dinev and Hart (2006), its influence was rejected in the study by Kim (2016) for the sharing of Facebook check-ins. Such kind of conflicts could be found among various studies, and these contradictory findings have seriously challenged the stable privacy perceptions of individuals (Lamsfus *et al.*, 2015; Bol *et al.*, 2018). Specifically, this paradox identified with privacy-related behaviours was later discussed among recent studies about its mechanisms. Within the consideration of dual-process models, numerous factors have been tested for their effects in

adjusting the relative dominance of processing systems (Evans, 2018; De Neys and Pennycook, 2019). Similarly, privacy concerns could also be one of the potential variables that drives individuals to think accordingly with different systems under various contexts.

Also, for the contributing relationship between antecedents and processing systems, the significances of different factors have been examined with conflicting findings in recent studies (Knijnenburg *et al.*, 2013b; Beldad and Kusumadewi, 2015; Kim, 2016). This kind of conflict reflects the complexity in explaining the individual's information processing under varied contexts. For instance, the reputation and monetary return are two main antecedents for individuals in rationally considering sharing the location-based information, but their significance in contributing to the rational processing system will be different under specific contexts (Saker, 2017). On the one hand, individuals are found to be fond of sharing popular locations, even without any monetary compensations, is strong evidence that people may ignore the monetary benefit sometimes when pursue reputations only. On the other hand, recent studies also found that individuals will still share the location-based information online for discounts and vouchers, even they do not really appreciate the location itself. These findings have indicated that although the influences of some antecedents of processing systems are proved to be significant in the general model, their actual linkage with the processing route need to be re-examined under different contexts.

1.2.3 Contextual Factors as Boundary Conditions

Hence, the investigation of contextual factors during the location-based information sharing could not only strengthen the understanding of dynamics for this specific behaviour, but also provide a further examination for the boundary conditions of identified factors of dual-process model in past studies. The boundary conditions proposed here, naturally, will take the form within the discussion of contextual factors, which means that the analysis of significances of related factors for individual's behaviours will be tested among a series interrelated yet separated contexts to see under what situations they can be seen as strong antecedents for the final decision. The boundaries will be built by establishing a framework for contextual factors with intersections of different

aspects within the topic, and through the examination of proposed relationships on these discrete contexts segmented by the combinations of contextual factors, their influences will be tested and discussed for the consistency and validity of these effects. For one thing, this exploration could help researchers to see more possibilities in the under-researched aspects for already identified factors, and to advance the discussion about the relationships between motivations and specific contexts. For another thing, with the findings on what are the salient factors under different contexts, practitioners could also have clearer guidance on what should be followed in motivating their users to share the location-based information under certain situations.

Similarly, for the dual-process models, the discussion of contextual factors could also examine the dynamics of antecedents for both processing systems, and provide some insights for the fine-tuning of processing systems for different contributing factors and moderations for the balance of their influences. The discussion offered in this thesis could broaden the scope of dual-process models, not only to investigate the effectiveness of rational and impulsive thinking under various situations, but also to explore the ability of dual-process models in solving conflicts caused by the complicated contextual situations (e.g., privacy-calculus paradox).

In summary, to fill the research gaps identified from existing studies, this thesis aims to unpack the context in the area of location-based information sharing and investigate its influence on individual's decision making through the perspective of behaviour-level dual-process model. The findings of this thesis could contribute to current literature by providing boundary conditions for identified factors, and platforms could find insights for their content strategy in providing context-aware services.

1.3 Research Questions

There are two main research questions in this thesis which are shown below:

1) **RQ1: How do location-related factors and place attachments influence individuals' sharing of location-based information on social media through a behaviour-level dual-process perspective?**

The first research question aims to investigate the dynamics and mechanisms of individuals in the sharing of location-based information. Compared with other kinds of information, location-based information has special attributes in terms of online-offline connections and high sensitivity (Xu *et al.*, 2009). Past literature has extensively documented the conflicts of behaviours of the same people through different decision-making processes (Chaiken and Maheswaran, 1994; Gilovich *et al.*, 2002; Wattanacharoensil and La-ornual, 2019). In this way, the behaviour-level dual-process model, such as heuristic-systematic model (Chaiken, 1980) and elaboration likelihood model (Petty and Cacioppo, 1986), has been used widely to capture the individuals' decision-making process. However, due to the inconsistency between the intention and behaviours, this study will adopt the behaviour-level dual-process model to explain the individual's sharing behaviour. Nevertheless, factors related to locations are also not well discussed in past studies about location-based information sharing. Recent literature revealed that unique feelings toward specific locations, which have been concluded as place attachments (Scannell and Gifford, 2017b; Dwyer *et al.*, 2019), could significantly manipulate individual's behaviours. Thus, how do these findings contribute to the existing theories and models need to be further tested.

2) **RQ2: What is the role of physical and social contexts in the decision-making process of location-based information sharing?**

Past studies have provided some examples in explaining abnormal behaviours under certain contexts, in these studies, they have proposed many factors that could lead to biased behaviours and intentions, including the peer pressure (Cramer *et al.*, 2011), immediate satisfaction (Acquisti *et al.*, 2017), and habits (Malik *et al.*, 2016), etc. Moreover, the sources of many biases discussed in previous literature falls into the framework of context-related studies. They have noticed that the decision of location-based information sharing are usually biased by environmental and contextual clues (Ou *et al.*, 2016), thus it is essential to include contexts in framing these dynamics in the decision-making process to test the boundaries of existing theories and models. And based on the past findings that physical and social contexts are two main dimensions in the location-based information, what are the primary considerations in these two

types of contexts are still unclear. Hence, the exact content within both physical and social contexts of location-based information will be firstly investigated. And based on the proposed model in this thesis, the effects of identified factors about location-based information sharing will be examined under different contexts.

1.4 Aims and Objectives

Based on the research questions from the last section, the following research objectives are proposed for completing the whole research.

1) Investigate the role of related theories and models in the area, such as place meanings, place attachment theory, and dual-process models in past studies.

The first research objective is about the review of existing knowledge on related topics. Factors that are proved effective in past studies will be summarized and discussed about their validity, boundary conditions, and fitness within the dual-process model.

2) Explore the structure of location-based contexts in the social media environment and establish an analysis framework based on the comparison between contexts.

Although past studies have provided a fundamental knowledge about the context in tourism, information sharing, and so on, the understanding of related aspects should be updated to suit the scope of this thesis. Besides, an analysis framework is needed to determine the specific context a location-based information belongs to.

3) A framework for location-based information sharing will be established, and the proposed hypotheses will be tested, and be further discussed under various contexts.

Based on the insights obtained from the related studies and contexts, a research framework will be proposed to test the effects of factors within the dual-process model. Moreover, with an additional consideration of contexts, these effects will be further discussed on their boundaries across different contexts.

1.5 Justification on the Research

The findings of this thesis could both contribute to the existing literature and provide insights for practitioners in location-based information sharing. Firstly, for the academic contribution, with an aim in examining the boundary conditions for the existing theories and models, this thesis plan to take the influence of contexts into the discussion of location-based information sharing. Besides, the dual-process model is adopted to include the impulsive processing of location-based information, which was merely addressed along with the traditional reflective thinking (Raymond *et al.*, 2017), in the establish of research framework. In addition, there exists a perfect match between the dual-process model and the consideration of contexts. Past studies have noticed that contexts could bias the sharing behaviour both consciously and unconsciously (Gay, 2009; Zhu *et al.*, 2010), and distinctions could also be observed between different motivations under certain contexts (Nardi, 1996; Lamsfus *et al.*, 2015), such as the difference between the visiting of popular café and local bistro. Therefore, the dual-process model could well capture the dynamics caused by contexts in the information processing and examine the boundary conditions of related factors in driving individual's behaviour.

Aside from the academic contributions, business practitioners like social media platforms, locative service providers, and businesses that rely heavily on location-based marketing could all find insights from the findings of this thesis. Firstly, for social media platforms, they could utilize the knowledge on contexts to offer better personalized recommendation and facilitate interaction between users around specific locations. Since social media platforms are always blamed for the push of inaccurate and random notifications that causes users' concern and dissatisfaction (Xu *et al.*, 2009), the topic of this personalization-privacy paradox has been regarded as the main barrier to the development of platforms (Awad and Krishnan, 2006; Bol *et al.*, 2018). Hence, if the platform could wisely choose the targeted content that adjusted with the exact context, then it may cause less concerns, and increase the loyalty of users in contributing content on the platform. Secondly, for locative service providers, the inclusion of context in their applications could enrich their business scope (Gay, 2009; Zhu *et al.*, 2010). Based on diverse purposes and motivations under different contexts,

these application providers could identify opportunities in their services beyond only business-related contents. Actually, although giant location-based applications like Foursquare and Dianping are famous for their business-oriented services like reviews and coupons, they have already initiated other trails in providing personalized service with their huge local knowledge database, such as time machine and life-logging. Lastly, for businesses that rely heavily on location-based marketing, with the help of context-aware knowledge, they could identify their targeted customers efficiently with mobile marketing and to develop their own special services to suit needs for their nearby customers purposely.

1.6 Organisation of the Thesis

The overall structure of thesis is presented as follows. In Chapter 2, an informative review of related past studies is provided based on different topics. The chapter begins by introducing the general background of location-based information and factors that found effective in driving individual's sharing behaviour in the existing literature. It then briefly introduces dual-process models, followed by a detailed discussion the classification and critical aspects between various models. Next, to provide an in-depth understanding of contexts in the information sharing literature, the aspects and factors discussed in past studies is presented. The chapter then presents an overview of place attachment theory, which was recognized as the source of main motivations related to locations and places. Thus, this chapter presents a comprehensive overview of the location-based information sharing area, including factors, theories, models, and challenges in existing literature so far.

Chapter 3 then summarizes the findings in past literature and proposes a research framework with hypotheses on influences between factors. It firstly establishes connections between the place attachments and processing systems within the dual-process model, and identifies the contributing factors under two place attachment - place identity and place dependence, respectively. Then, based on the discussion on relationships within the research framework, hypotheses are proposed to examine the mechanism for the location-based information sharing behaviour.

Chapter 4 aims to design and develop a valid methodological framework that involves both qualitative and quantitative methods for the research. Specifically, along with the justification for the mixed-method approach, it presents the sequence, structure, and relationships between the two methods. Detailed introductions on how this thesis collects, pre-processes, analyses and discusses the data are also provided for both quantitative and qualitative studies.

Chapter 5 and Chapter 6 then provide analyses for the data collected in both qualitative and quantitative studies. With the investigation on the content expressed by participants, an updated understanding of aspects in location-based contexts has been provided, and an exploration on the perspectives of how individuals perceive locations are also identified for both physical and social contexts. Next, based on the findings from qualitative study, the data collected through scenario-based survey that primed with corresponding contexts are used to examine the proposed research framework. Start from the initial test for the general model, the influences of contexts are also evaluated for the boundary conditions of factors and dynamics in the dual-process model.

Chapter 7 then provides discussions for the result obtained in previous sections. The characteristics of location-based context in the social media environment are summarized and compared with traditional understandings. Moreover, the effects of place attachments on location-based information sharing are confirmed from a dual-process perspective, and the role of privacy concern is also discussed. More importantly, the results obtained from various contexts are also compared and evaluated. Detailed boundary conditions are proposed for the effects of factors under different contexts, and it also provides insights in solving the challenges found in past studies about impulsive behaviours.

The thesis concludes in Chapter 8 with an overview of the work presented in this dissertation and the discussion of the contributions and limitations.

1.7 Conclusion

As an introductory chapter, this chapter has briefly introduced the background of this thesis and the motivation for conducting the research. It then formulated the main research questions of this research and introduced the research aim, as well as the research objectives that are to be accomplished. It also highlighted

the potential contributions of this thesis and justification on the research. Finally, it introduced the structure and organisation of this thesis.

Chapter 2 Literature Review

2.1 Location-based Information

Previous literatures have explored a lot of different aspects about the location-based information sharing behaviour on social media. Despite the simplicity of the action itself, the impact of location-based information sharing is not trivial, because it operates not only as a means of information dissemination but also for ego-oriented psychology that gratifies self-identity (Wang, 2013).

2.1.1 Types of Location-based Information

Past studies found there are several different types of location-based information sharing based on the sharing methods, purposes and recipients. Knijnenburg *et al.* (2013b) has categorized the location-based disclosing services into two parts: the "check-in" services such as Foursquare which use an active form of location sharing and the "always-on" services such as Google Latitude which use a passive and continual form of location sharing. The biggest difference of these two parts whether the system require the user's intervention to disclose the location-based information. Besides, Tang *et al.* (2010) has reframed the location-based information sharing as being either purpose-driven and social-driven. The purpose-driven sharing behaviours are mostly motivated by contexts that emphasize a more utilitarian perspective of location sharing and focuses on activities like coordination and planning, while the social-driven sharing behaviours mostly appear in motivating contexts that emphasize the social aspects of location sharing, where users might announce their arrival at a location not because others need to know but because it is simply interesting or fun to do so (Tang *et al.*, 2010). Moreover, according to the number of recipients, Tang *et al.* (2010) has also organized four categories four types of sharing behaviours: those that primarily sharing location with one other person (one-to-one), with a small group (one-to-few), with a large group (one-to-many), or with everyone on the platform (one-to-all). The range of one-to-one to one-to-all sharing is important to the framing of purpose-driven and social-driven location sharing. Generally speaking, one-to-one and one-to few sharing are purpose-driven sharing, while one-to-many and one-to-all sharing is more social-driven.

Specifically, the classification of location-based information in past studies can be summarized in Table 2.1.

Table 2.1 Types of Location-based Information

	Types	**Examples**	**Literature**
Methods	Check-in	Foursquare	Cramer *et al.* (2011); Kim (2016)
	Always-on	Google Latitude	Page and Kobsa (2010)
Purposes	Social-driven	Instagram	Smith *et al.* (2005); De Souza e Silva and Frith (2010); Lindqvist *et al.* (2011); Evans (2015)
	Purpose-driven	Google Maps	Page and Kobsa (2010); Di Masso *et al.* (2019)
Recipients	One-to-one	Private	Freudiger *et al.* (2010)
	One-to-few	Group	Van Winkle *et al.* (2018)
	One-to-many	Community, Organization	Silver and Matthews (2017)
	One-to-all	Social Media	Page *et al.* (2012); Evans (2015); Schwartz and Halegoua (2015)

Specifically, although the fever of location-based information sharing has reached a peak in recent years, the early trials and exploration in the application of this system have started long before people realized how it will change the people communicate in the mobile age (Want *et al.*, 1992; Koeppel, 2000; Schiller and Voisard, 2004; Burak and Sharon, 2004; Zhu *et al.*, 2010; Tsai *et al.*, 2010; Cramer *et al.*, 2011). One of the earliest attempts in these systems is the Active Badge system (Want *et al.*, 1992), which was designed to allow colleagues to be aware of each other's location in the office with the support of wearable badges to track people's movement. In practical, most of the systems that have been developed and researched in past year mainly focused on tracking of user location, while providing the user multi-layer options to control for the shared content in terms of who can see and what the others can see (Zhao *et al.*, 2012). Besides the early developments of location sharing systems, some other applications are also launched, with the aim to make profits and create values from the sharing behaviour. For instance, the commercial system Loopt[8] was

[8] https://Loopt.com

launched with a tracking model which allows users to see other people's current location information during the specific time period in the settings (Li and Chen, 2010). However, most recent applications that specialized in providing location sharing services began to offer mixed functions with both tracking and single information sharing experience. One example is the Google Latitude application that mainly employs a GPS technology for users to continually share their real-time location, which also enables their users to share a single location to others during the tracking (Page and Kobsa, 2010).

However, many of the most popular, commercial location-sharing services right now, such as Foursquare, Facebook Places and WeChat, prefer to use a one-to-many single information sharing schema, which is called the 'check-in' model (Frith, 2014). In contrast with the previous tracking model, the check-in activity allows users to voluntarily create and name venues in the map, and to manually check-in and broadcast their location to their friends on the service itself and to potentially very large audiences on Facebook and Twitter (Kim, 2016). This new kind of way in the dissemination of location-based information differs from the ones in the past in a number of aspects (Wang, 2013). For example, compared with the passive tracking model in which location information will be shared without interventions, people tend to believe that the active sharing of particular location contains more implicit meanings (Cramer *et al.*, 2011).

In the tracking model, the usage of location-based information sharing application is more about the utilitarian aims, people allow others to see them and search for other's movement only when they want to participate in nearby activities (Koeppel, 2000). However, either from the perspective of the sender or the people who see the information, the active shared location-based information are believed to have more personal-related meanings and social-oriented implications (Wang and Stefanone, 2013). Besides, another marked difference between two methods is the size of audience and the longevity of the information. For the live tracking of location information, due to the high sensitivity and low information density, the expected audience will not be large (Page and Kobsa, 2010). Also, since the tracking information is hard to be stored and reviewed afterwards, its usage is limited within the temporal context and are often related to utilitarian purposes (Shane-Simpson *et al.*, 2018). However, for

the single shared location-based information, it can be stuck to the personal page as a permanent record and also easy to be reviewed to recall memories anytime at will (Kim and Fesenmaier, 2017). These two main differences between the tracking and active sharing of location-based information have empowered platforms and service providers to explore and exploit the new value that location information sharing can provide (Frith, 2014).

2.1.2 Salient Factors in Location-based Information Sharing

In order to unravel the mechanism behind the sharing of location-based information, and to explore what motivates people to share and how people perceive these information, extensive studies have been conducted in summarizing the motivations for location-based information sharing. As the most common seen type of sharing, Tang *et al.* (2010) point out that one-to-many sharing on the platform is more complicated and requires more consideration before the final decision than one-to-one or one-to-few sharing. Specifically, instead of just deciding on whether to share with one person or a limited scope of group, users now need to consider the appropriateness of the content for all the audience that the information may be exposed (Knijnenburg *et al.*, 2013b). Thus, the change in the style of using location-based information caused by this type of sharing has raised a wide range of discussion among recent studies.

Benefits and Privacy Issues of Location-based Information Sharing

Firstly, for service providers like Foursquare which offers both intra-platform social network and inter-platform information linkage services, it can be found that the potential large audience on social networking sites (e.g., Twitter and Facebook) will lead to more performative behaviours, instead of just using the information as a communication tool (Cramer *et al.*, 2011). For the value that associated with the location information, Zhao *et al.* (2012) argue that the value of location information is hard to be achieved through simple tracking or communicating through location itself. Instead, it is more about how the location information is used, read, viewed, and manipulated. In a word, sharing one's location and knowing the whereabouts of others is not only a practical tool for

coordination and communication (Barkhuus *et al.*, 2008). It is used not only to express whereabouts, but also moods, lifestyle, and events.

To start with, by using a set of interviews and two surveys, Lindqvist *et al.* (2011) identified clusters of motivations for sharing one's location through Foursquare, including games and badges (which included both playing for fun, but also self-presentation and being proud of badges), social connection (keeping in touch, ad-hoc meetups, seeing where friends have been), place discovery and keeping track of places, and meeting new people, but also simply 'something to do'. Nevertheless, since the sharing of a single location-based information is much more complicated than the general usage motivations on the platform, many studies tried to investigate the motivation of users in sharing specific location information, especially from the performative perspective (Kyle *et al.*, 2004; Liao *et al.*, 2011; Rode, 2016). Recent research also focused on the self-expression and self-presentation function of location-based information sharing and its contribution to the motivation of users to disclose their location-based information online. Reviewing literature of self-presentations for one's identity and sociality construction, Wang and Stefanone (2013) conceptualized Facebook check-in as a tool for impression management. They argued that "presentation of place" eventually would facilitate and satisfy one's desire to be connected to other people online using a certain image of the person. In addition, people are willing to display their activities in an online social space when their personality prefers such behaviour and they believe their life is pleasant enough to show off to their friends on Facebook. However, it is not clear that these findings can also infer that the motivations for self-disclose on Facebook are identical to those for sharing location information with friends on Facebook with a promotional purpose or similar motivation.

However, besides the general motivation, the location-based information sharing may need further speculation in terms of what exactly drives people to share the information. Some of the previous works on photo sharing and tagging might offer insight into this conceptualization task. With a basis of understanding social-computing communities, Nov *et al.* (2010) developed four distinct dimensions of motivations to share, annotate, and tag photos on Flickr - enjoyment, commitment to the community, self-development, and reputation

building. These four dimensions may serve as motivations for location check-in as well in that checking in at locations is a voluntary action of information sharing. Such self-initiated action inherently aims at practicing one's capability to contribute to a community along with expectations of increasing popularity as well as expertise (Sundar, 2008; Kim and Sundar, 2011). In fact, Lindqvist *et al.* (2011) found that people checked in at their location via Foursquare in order to pursue continued connection with friends, to enjoy the sharing of their locations, and finally to explore new places for their own experiences. An earlier work by Ames and Naaman (2007) also suggested that even information sharing in the domain of Flickr would have two conspicuous purposes: functional and social. People upload visual information not only for their own future use, like wireless digital albums, but also for a means of contribution to the community along with gaining popularity. Likewise, as a form of information sharing, location check-in might be articulated by similar motivations of visual information sharing.

Similarly, Sun *et al.* (2015) has claimed that information disclosure has identified two types of benefits associated with the information disclosure behaviour: utilitarian benefits and hedonic benefits. Utilitarian benefits are associated with the productivity and efficiency issues. For example, Xu *et al.* (2009) figure out that consumers can obtain personalized product recommendations by disclosing their location information to the stores or the restaurants around their locations. Unlike utilitarian benefits which are based on the instrumental view, hedonic benefits are associated with users' pleasure and enjoyment (Chen, 2013; Krasnova *et al.*, 2010) which is based on the interest in the action itself rather than external reinforcement (Davis *et al.*, 1992). The information disclosure behaviour may result in both utilitarian and hedonic benefits, but these two types of benefits may have different weights in terms of the specific contexts.

And besides the driving factors, the privacy is undoubtedly the main concern that prevents individuals' sharing behaviour, especially for the location-based information (Goh *et al.*, 2007). Although it is not entirely public and prescribed within one's personal network, location-based information sharing still deems the issue of potential privacy invasion (Ames and Naaman, 2007). Privacy is

defined as “the feeling that one has the right to own private information, either personally or collectively” (Petronio, 2002). As a determining factor in the sharing of location-based information, an abundance of studies has been conducted on the issue of privacy concerns, and focuses on the effect of time, audience, and surroundings on the sharing behaviour. In detail, whether the location-based information will be shared depends on the expected audience of the information, the aim of the sharing, and the appropriateness of the meaning that the location carries (Lipford *et al.*, 2008). For the expected audience, people tend to share more location-based information with close friends rather than strangers or unknown audience (Brandtzæg *et al.*, 2010). Besides, for the aim of sharing, although location-based information sharing is often regarded as a signal of activity invitation to others, this is not always true on social networking sites.

Recent studies have argued that, instead of using the location sharing as an activity coordinator, it is more usually used as a carrier of personal- or social-related symbols to facilitate more complex social activities (Lehrer *et al.*, 2011). Due to the variance in the meaning of locations and the mixed audience on social networking sites, people will develop sophisticated privacy preferences, according to specific time- and location-based restrictions (Knijnenburg *et al.*, 2013b). These privacy strategies are also dependent on the motivations people have for sharing their location. For example, users may blur the information during the sharing when the sensitivity of the exact location is relatively high to avoid potential conflicts. Also, users prefer to share locations that are interesting and eye-catching to boosts their image for social reasons (Tsai *et al.*, 2009).

Some studies conclude that there are also huge differences in personalities and preferences among people in location sharing, some people are more careful in sharing location-based information and the only reason that motivate them to share is that they can see clear benefits and needs in the sharing, or they are requested or asked to share the location information for specific reasons (Scannell and Gifford, 2017a). Although Page *et al.* (2012) have found that privacy concerns significantly influence people’s usage of Google Latitude, they also identified several other more salient tensions which can affect the strength of these concerns, such as social conformance and trends, filtering of location

and audience management. Also, Barkhuus *et al.* (2008) point out that location privacy is the key to understand social norms within social groups, and it must be understood in the context of continual communication and impression management. However, another challenge that has been posed in past studies is that people do not only release their worries in privacy issues when they refuse to share (Taddicken, 2014), other situations like the urgent practical use, the desire to express and share interesting experiences, strong mood and group activities and the awareness of reciprocity can all to some extend bypass the negative influence that any concerns about privacy may raise (Norberg *et al.*, 2007).

Following the previous exploration on the influence of privacy issues, a body of literature have examined users' perceived privacy on social networking sites (Knijnenburg *et al.*, 2017; Aivazpour *et al.*, 2017; Wang *et al.*, 2019; Wisniewski *et al.*, 2020). Surprisingly, they found that information disclosure is not always negatively correlated with privacy concern (Christofides *et al.*, 2009), but also depends on the context factors, such as framing, information cues, and on-site perceptions (Anaraky *et al.*, 2018; Wang *et al.*, 2019). Moreover, this discrepancy between the expressed concern and the actual behaviour of users is a phenomenon known as the privacy paradox: users claim to be very concerned about their privacy but do very little to protect their personal data. Most of the research into the privacy paradox considers general internet activities with a focus on e-commerce and social networking activities in particular. Known as the privacy paradox, it is a documented fact that users have a tendency towards privacy-compromising behaviour online which eventually results in a dichotomy between privacy attitudes and actual behaviour (Norberg *et al.*, 2007). There are currently multiple researches trying to explain the privacy paradox. Oomen and Leenes (2008) claims that a certain degree of risk perception implies greater knowledge of privacy protection strategies but appears an insufficient motivator to apply such strategies. Thus, while many users show theoretical interest in their privacy and maintain a positive attitude towards privacy-protection behaviour, this rarely translates into actual protective behaviour. Nevertheless, besides the paradox regarding the privacy, similar phenomena have also been witnessed in other contexts with varied dominant factors bias

people's decisions. For example, past studies have found that people will tend to trust people using more outwardly logical words, even the content itself does not follow the exact logic or is totally nonsense.

To conclude, the information individuals provide online could pose a serious threat to privacy if not properly handled; however, it also can be used to provide customers with personalized services and other benefits (Beldad and Kusumadewi, 2015). Thus, the discussions around how to balance the privacy and associated behaviours have long been a hot topic in existing literature (Bol *et al.*, 2018; Wang *et al.*, 2019). Although the notion of privacy itself may sound straightforward, the practical boundary of privacy in real life varies with numerous factors including contexts, cultures, and regulatory laws (Culnan and Bies, 2003). Moreover, in order to better capture the exact concern that user may experience about privacy in information, the concept of information privacy was proposed to refer to an individual's subjective views of fairness during the disclosure of personal information (Taddicken, 2014).

Calculus-based Model

Specifically, the concern of privacy violation on location-based information sharing has been enlarged by the complicated data flow in the mobile network (Kelley *et al.*, 2013). As shown in the Figure 2.1, the data flow through several main components in the location-based networks, and any error or leakage happened in the data transfer between components will lead to serious privacy risks to users. For example, the exact positioning of the user's current location will be exposed to the service providers in the location-based networks, as well as the content and data providers (Iachello *et al.*, 2005). Nevertheless, the privacy is not only about the data leakage, but it also involves the social circumstances that information may cause misunderstandings. Thus, the discussion on privacy issues in location-based services are not limited to the cyber security, most past studies in information systems have approached this problem from the control of the information shared on the network.

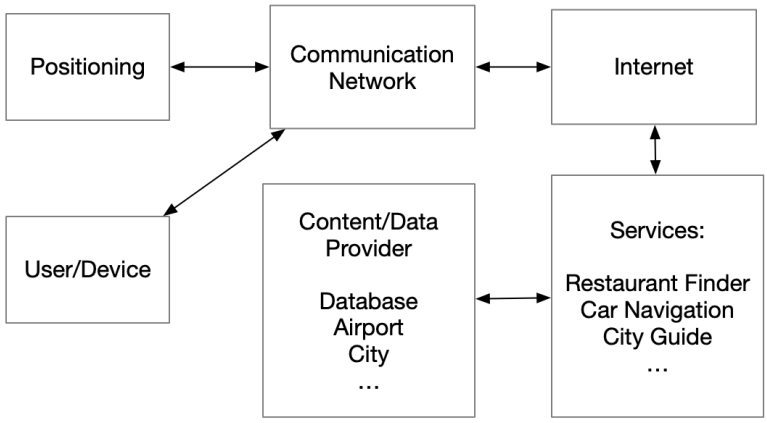

Figure 2.1 Main Data Flow between the Components in Location-based Network

It is most likely that the perceived risk of information disclosing affects the information sharing attitude and behaviour of an individual (Bansal and Gefen, 2010). Some authors explain the privacy paradox by assuming that expected returns have a direct influence on privacy behaviour, whereas the perceived risk influences the reported attitude and behavioural intention (Wilson and Valacich, 2012). However, to systematically frame the two-way effects of both positive influence posed by expected returns and negative influences posed by privacy-related factors, they are often grouped together in discussing the unified impacts on final decisions (Dinev and Hart, 2006; Li *et al.*, 2010; Krasnova *et al.*, 2012; Bol *et al.*, 2018). This has formed a typical kind of calculus-based model proposed by Culnan and Armstrong (1999), named privacy calculus model.

The calculus-based model assumes people will make decisions based on rational trade-offs, and it is regarded as the most efficient method in explaining social media usages (Krasnova *et al.*, 2012). The general framework of calculus-based model is shown in Figure 2.7, which contains the main components included in past studies, namely the perceived risks and benefits, the perceived concern, and the intent/actual behaviour of the information sharing.

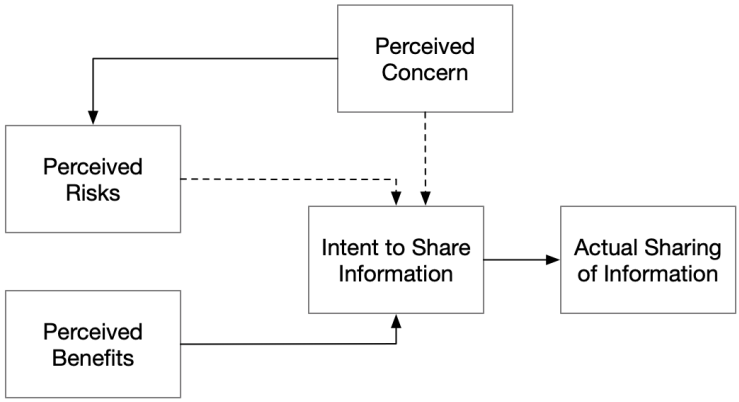

Figure 2.2 General Framework for Calculus-based Models

Specifically, in the context of location-based information, as a kind of privacy-related information, it will be influenced by multiple potential factors including the user's privacy concerns, mood, design of the user interface and so on (Sun *et al.*, 2015; Kim, 2016; Wisniewski *et al.*, 2020). And almost all the past literatures considered privacy as a critical aspect in their research. Privacy calculus is a common approach to studying the joint effect of opposing forces on privacy perception and behaviour (Culnan and Armstrong, 1999). The theory suggests that a person's intention to disclose personal information is based on a calculus of behaviour (i.e., privacy calculus) in which potentially competing factors are weighed considering possible outcomes. Specifically, consumers perform the risk-benefit analysis in the privacy calculus and decide whether to disclose information based on the net outcomes (Xu *et al.*, 2009).

Laufer and Wolfe (1977) coined the term calculus of behaviour to refer to the cognitive process that underlies people's disclosure decisions. Many researchers have since used the term privacy calculus to describe privacy-related decision behaviours (Dinev and Hart, 2006; Krasnova *et al.*, 2012; Sun *et al.*, 2015), and it has become a well-established concept in privacy research (Hugl, 2011; Iachello *et al.*, 2005; Kelley *et al.*, 2013). Other researchers, however, have demonstrated that people rarely take a truly calculative approach to privacy decision making, and are often prone to take mental shortcuts instead (Knijnenburg *et al.*, 2017; Bol *et al.*, 2018). The privacy calculus is commonly operationalized as a trade-off between risk and benefit. The psychological

process behind this trade-off is often seen as a conscious and rational decision process (Knijnenburg *et al.*, 2017). Moreover, along with the privacy, more factors have been added into the consideration under similar circumstances, such as the fear of negative feedbacks from others (Hsieh *et al.*, 2014), the concern to disturb others (Bol *et al.*, 2018), and the inefficacy in judging the content reliability (Wang *et al.*, 2019), etc. However, although these derived models have been verified for their effectiveness in explaining several user behaviours under various contexts, these specific decision theories have been criticized for making unrealistic assumptions about the rationality of decision-makers (Wilson and Valacich, 2012), and a similar criticism can be levelled against the privacy calculus itself (Knijnenburg *et al.*, 2017).

Furthermore, many risk and benefit factors that influence the calculus process and behaviour intention have been studied in literature. Take privacy calculus model as example, Petronio (2002) has described the types of risks and benefits of personal information disclosure in social situations. Firstly, for benefits in sharing information online, Petronio (2002) proposed five types of benefit: expression, social control, relationship development, social validation and self-clarification, and also five types of risks: security risk, stigma risk, relational risk, face risk and role risk. Specifically, the benefits and risks for information sharing on social media are also extensively discussed in past studies. Generally speaking, people express high intentions to share information on social media like Facebook due to the sense of social connectivity and expected emotional and reciprocal benefits with peers (Quan-Haase and Young, 2010). Richter and Koch (2008) has investigated the general usage of social media users and summarized the functionalities of these social network sites into six primary categories, including identity management, expert finding, context awareness, content management, network awareness, and exchange. When look closer into this phenomenon, Lin and Lu (2011) found that the perceived benefits from both utilitarian and emotional perspective can positively influence people to use social network sites. They claim that the desire for self-expression is a primary need that can be fulfilled by participating in social activities on the platform, and the fulfilment itself can provide a feel of satisfaction which will further motivate people to continually use the social media. Besides, the network connectivity of

the platform in meeting potential new friends and relationship expansion was also found a critical factor in influencing user's social media engagement (Chung *et al.*, 2016). Furthermore, this sense of being connected was confirmed to be significant in driving individual's information sharing behaviour by Liao *et al.* (2011), which found that the main reason for blog users to continually maintain their articles and personal pages is the desire to be connected with friends and people with similar interests.

Moreover, the advent of social communication technologies and tools are transforming social interactions via new dynamics and terms. Recent studies have emphasized that two main drivers of individuals in sharing information on social media comes from the sense of connection and the expected social capital that can be achieved (Erickson, 2011). In the blog content contribution context, Chai *et al.* (2011) claimed that the continuous information sharing through blogs will be significantly motivated by the trust toward the platform, strength of social ties, and perceived reciprocal benefits. Their study also found that there is a strong connection and transformation effect of the social norms from the offline to online blogging websites (Chai *et al.*, 2011). As for the different types of information, past studies have found that the sharing of videos are highly motivated by the reason of entertainment and interpersonal relationship boosting (Hanson and Haridakis, 2008). Also, on Flickr, a social media platform which designed for image and video sharing, users tend to actively share contents due to several community-related factors like the need for self-organization, self-communication, social organization, and social communication (Angus and Thelwall, 2010). Rode (2016) studied employees' intrinsic and extrinsic motivation to share knowledge on enterprises' social media platforms. An individual employee's extrinsic motivation (e.g., reputation and reciprocal benefits) and intrinsic motivation (e.g., self-efficacy, self-identity) have been found to be positively related to knowledge-sharing behaviour. Mettler and Winter (2016) reported that information quality, reciprocity and social cohesion, and privacy concerns are significantly related to an individual business user's attitude toward information sharing in enterprise social systems.

Taken all together, some apparent factors could be easily identified from these studies, due to the frequency it appeared in the literature and the fitness in its

compatibility with location-based information. Firstly, the reputation gain and relationship benefit are two of the most adopted factors in utilitarian benefits (Dinev and Hart, 2006; Wang *et al.*, 2016; Wang *et al.*, 2019). Firstly, in the location-based information sharing, the relationship benefit is definitely an inevitable factor in satisfying the need of individuals. Because location has long been used as an anchor in developing relationships with local people (Smith *et al.*, 2005), and also a representative symbol for groups and communities (Raymond *et al.*, 2010), the benefit related to relationships is a nature outcome of the location-based information sharing. Secondly, for the reputation gain of information sharing, it is proposed that the sharing of particular information with high value in distinctiveness, expertise, and rareness could generate a corresponding return in the increase of reputation in the community (Emelo, 2012). This matches with the function that location provides for individuals in status presenting, through the attached collective meaning by the mass media (Wang, 2013). The implicitly afforded signals in a location could be delivered to the audience through deliberate sharing, such as showing-off on social media (Wang and Stefanone, 2013).

In addition, for the emotional benefit that refers to the functions of information sharing in stress relief, comforting, and simply finding something to do, it is found effective in motivating individuals to share information to others (Sun *et al.*, 2015). Similarly, the location is also found effective in providing a safe-haven for individuals, and this sense of safety allows them to calm down or feel happy for just being there (Barcus and Brunn, 2010). Moreover, similar findings were also revealed for location-based information sharing, Skop and Adams (2009) proposed that the linkage with virtual places through communicating with information could help migrants to ease the homesickness.

Lastly, the altruistic benefit is also a vital predictor of information sharing in past studies (Chiu *et al.*, 2006; Tang *et al.*, 2010; Tsai *et al.*, 2010). Defined as the degree to which an individual believed he or she could contribute benefits through information sharing to others, the altruistic benefit measures the perceived benefit for others that individuals anticipate in performing particular behaviours (Chung *et al.*, 2016). This type of benefit mainly happens during the contribution to community and collective information (Emelo, 2012; Widén-

Wulff, 2014; Rode, 2016), such as knowledge sharing and product review, and location is also one of them. Location-based information, as a means to record local knowledge, its meaning and image were constructed through collective behaviours (Frith, 2014; Wang *et al.*, 2014), and the sharing could be motivated by the reason that such knowledge is helpful for others (Kim and Fesenmaier, 2017). Therefore, the sharing of location-based information can be seen as a behaviour that facilitates benefits for others or organizations in providing enriched knowledge of locations, a good example here is the recommendation and warning for restaurants to friends (Cramer *et al.*, 2011; Frith, 2014).

Psychological Considerations and Self-construal

In another way, the location-based information can also be regarded as a tacit strategy in social environment when the unsaid message is hard to be expressed in an explicit way. It can support social repartee and tell the ongoing story within social groups, while also providing a resource for other interactions and a tangible representation of shared locations, supporting exchange enjoyment and friendship (Frith, 2014). Through sharing the location-based information that user thinks are interesting, it can also enhance self-presentation and facilitate unexpected interactions with people who share similar interests (Lindqvist *et al.*, 2011). In the social context, the location-based information sharing can be used as a tool to fulfil social duties, such as reporting the arrival at destination, expressing gratifications, and telling others that all is well (Frith, 2014). Besides, the interaction initiated by the location-based information sharing could also bring a sense of connectedness and togetherness among people (Carrus *et al.*, 2014). This situation is widely observed within social groups, where the location information can also be encouraged to be shared due to the community identity and moral or peer pressure motivations (Beldad and Kusumadewi, 2015).

The concept of performative behaviour comes from the study by Goffman (2002), which describes that interactions between humans can be seen as performances, and all the involved actors in the context will manage the impression of themselves. The spread and perception of these impressions can be both intentional and unwittingly, depending on the familiarity, strength, and type of the performance. Besides, Reeves *et al.* (2005) argue that the users on public social platforms are also performers, and their usage and strategies in

sharing information can pose different impacts on spectators. From the perspective of different roles on the platform, users may behave and perceive differently toward the information. For example, social media users construct their identities and present themselves according to what they think is appropriate for the imagined audience (Cramer *et al.*, 2011). Specific to the context of location-sharing, Larsen (2010) find that users will strategically manage their self-presentation through location and activity describing, and the awareness of other users could also affect the poster's own self-presentation.

Besides, Goffman (2002) described impression management using the metaphor of theatre production; the social actor picks props and costumes appropriate to a specific audience. In location-based information sharing, these costumes take the form of locations shared by a user, which are typically chosen with a specific audience in mind. Nissenbaum (2004) posited that two types of norms govern potentially private information: norms of appropriateness and norms of information flow. She proposed that together these two norms form the concept of contextual integrity. Contextual integrity is violated when information is shared beyond the expected norms, leading to a sense of compromised privacy. Failed attempts at impression management can thus be seen as violations of contextual integrity. For example, Wang *et al.* (2011) found that many regretted posts on Facebook arose because a message meant for a subset of the user's social circle was disclosed to a larger set and/or to a different subset, creating a mismatch between expected and actual audiences and this will increase the risks when users disclose their location-based information online. To examine impression management in location-based information sharing, Tang *et al.* (2010) conducted a study that included 10 participants. They found that location sharing services users shared locations across multiple social groups with strong as well as weak ties. They also mentioned how attempts at impression management sometimes backfired when contextual integrity was violated due to differences in norms among different types of ties.

Based on these findings, from a more inward analysis of individual behaviour on social media, the consideration on individual's psychological process has been raised in past studies (Van Dyne and Pierce, 2004; Karahanna *et al.*, 2015; Scannell and Gifford, 2017a; Dawkins *et al.*, 2017). By assuming that users have

personal connections with the content, or at least with the object that represented by the content, the psychological process will be activated during the usage of social media (Hoskins, 2011). Past studies have investigated this kind of bonding between the individual and information from several different perspectives. Firstly, one of the main associations between the people and their digital archives is the ownership. Specifically, people who feel ownership of an object experience a connection between themselves and various tangible and intangible targets (Pierce *et al.*, 2001), stimulating corresponding behaviour. For this reason, researchers have a keen interest in the concept of psychological ownership and its outcomes. Psychological ownership has been described as a cognitive-affective construct, a state in which an individual feels as though an object or a piece of an object is theirs (Pierce *et al.*, 2003); it may also be described as a feeling of possessiveness and of being psychologically tied to an object (Pierce *et al.*, 2001).

The starting point in providing a conceptual framework for psychological ownership is to identify its targets and assumptions (Avey *et al.*, 2009). When people have a sense of ownership, they experience a connection between themselves and various tangible and intangible targets. In the psychological ownership literature, the term target is quite broad and refers to whatever the object of attachment represents to an individual or group (Baym, 2015). The targets of ownership can become so deeply rooted within people's self-identity that they can be viewed as an extension of the self (Dawkins *et al.*, 2017). The invisibility of users on social media facilitates anonymity and allows people to express themselves freely (Karahanna *et al.*, 2015). Based on these characteristics, the expressed-self online is created using digital tools, and it can change through self-exposure and self-description. While the actual self in the offline real world depends on physical characteristics, the expressed self in a virtual environment depends on an individual's self-description, regardless of their physical conditions (Karahanna *et al.*, 2015). Goffman (1959) found that a person develops multiple identities. A diversity of identities is more explicit in cyberspace because the anonymity of online users gives them the freedom to manipulate their identities.

In the literature, the most essential factors in psychological ownership about the information sharing are believed to be the belongingness, and self-identity (Avey *et al.*, 2009; Pierce *et al.*, 2001). For belongingness, in terms of psychological ownership in organizations, belongingness may best be understood as the feeling that one belongs in the community (Avey *et al.*, 2009). When people feel like owners in a community, their needs for belongingness is met by having a place in terms of their social and socio-emotional needs being met (Avey *et al.*, 2009). Similarly, the sense of belonging is considered an important factor and has been used as a test for the presence of an online community. Several studies have suggested the sense of belonging as a mediator in community sustainability in terms of member loyalty and intention to participate in community-related activities (Teo *et al.*, 2003). As for self-identity, which matches with the discussion in the last section, it is regarded as one of the strongest drivers of sharing behaviour. Possession is the core concept in psychological ownership, and possessions serve as symbolic expressions of the self; self-identity and individuality are closely connected with possession. People have used ownership for the purpose of defining themselves, expressing their self-identity to others, and ensuring the continuity of the self across time (Pierce *et al.*, 2001). Moreover, following this route, the two specific factors are further proposed to describe more constructs related to self-construal.

Self-esteem, which refers to one's perception of the value or worth of the self, is regarded as an important intrinsic benefit of information sharing (Lee and Jang, 2010). Indeed, Chan *et al.* (2004) found that those who have shared information within a virtual community experienced increased self-esteem after receiving positive feedback, and this self-enhancement effect emerged as one of the major factors inducing knowledge provision among potential contributors. Moreover, the continuity, as a main source of self-identity, was also found a predictor of information sharing behaviour (Wang and Xu, 2015). The identity is defined by Stets and Biga (2003) as a set of meanings attached to the self that serves as a standard or reference that guides behaviour in situations, the continuity thus serves as a confirmation over-time to ensure the persistence of this identity. As for information sharing, the expressed information to others could be seen as a

digital archive that preserved online, and it is also perceived as record that individuals leaves to mark personal histories (Papangelis *et al.*, 2020).

These mentioned factors related to psychological considerations and self-construal are also discussed in the context of location-based information sharing. Firstly, for the belongingness, locations have the ability to form communities, and provide reference point for residence to present identities (Di Masso *et al.*, 2017). Therefore, the sharing of location-based information can also be seen as a behaviour that driven by the membership of self-chosen community (Gu and Ryan, 2008). Besides, the self-esteem in location-based information stands for the esteem attached with places individually and collectively (Wang and Xu, 2015). Examples like gym sharing and restaurant review all reflect a tendency that individuals like to present their strength through location-based information, and past studies have confirmed this finding both qualitatively and quantitatively (Goel *et al.*, 2011; Moores, 2012; Wilken, 2014). In addition, like other types of information on social media, the location-based information can even provide stronger functionality in marking individuals' past. The content embedded in location-based information is more than just features of the place itself, it also contains the contextual environment, activities, and associated moods at that time (Zhu *et al.*, 2010; Yao *et al.*, 2018). Therefore, for the aim of impression management and identity preservation, the location-based information are extensively shared due to the purpose to maintain a continuity on social media (Wang and Xu, 2015).

2.2 Dual-process Models

Numerous studies on individual decision-making have shown that the exact process is affected by various cognitive biases and heuristics (Knijnenburg *et al.*, 2013a; Acquisti and Grossklags, 2007). For example, it is unlikely that every individual is able to access exhaustive information precisely to concern all possible costs and benefits when making a sharing decision, and even on the contrary, consumers are often not even aware that their data is being collected (Wakefield, 2013). Hence, their decision is based on incomplete information, which can lead to the over- or under-estimation of the costs and benefits and might therefore seem irrational to the audience. But at the same time, the decision looks still fair to the decision-maker (Flender and Müller, 2012).

Moreover, the human ability to cognitively process an information is limited to a certain degree, which means even if a consumer has access to all necessary information, he or she may still fail to make an informed decision. In the literature, this effect is often referred to as bounded rationality (Flender and Müller, 2012; Knijnenburg *et al.*, 2013a). Besides, the decision-making process also often suffer from cognitive biases because the decision maker employs certain heuristics to compensate for his/her bounded rationality (Wakefield, 2013).

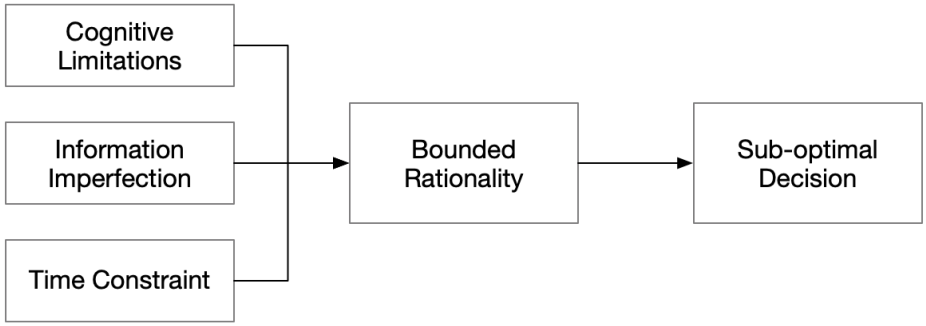

Figure 2.3 Three Main Limitations that Lead to Sub-optimal Decisions through Bounded Rationality

Hence, the resulting behaviour might not reflect the original intention or the expressed attitude towards that behaviour. The above-mentioned factors have been summarized as the three main limitations that will lead to the sub-optimal decisions through the effect of bounded rationality (see Figure 2.4). Moreover, based on these statements, widely used frameworks and models were developed to capture these limitation's influences on individuals' intentions and behaviours. Besides, popular examples for these cognitive biases includes the affect bias which states that people judge quickly based on their affective impressions, thereby underestimating the risks of things they like and overestimating the risks of things they dislike (Gilovich *et al.*, 2002) and the immediate gratification bias which claims people tend to value present benefits or risks more than those that lie in the future (Acquisti and Grossklags, 2003).

2.2.1 Dynamics in Processing Systems of Dual-process Models

In line with discussions among information processing mechanisms, research in cognitive psychology and consumer behaviour has widely adopted a dual process view on human thinking (Dhar and Gorlin, 2013). That is, individuals are supposed to possess two independent, yet interacting cognitive systems that guide decision-making processes (Evans, 2018). While the experiential system is characterized by quick, automatic responses based on emotional reactions and past experiences, the rational system embraces logical and effortful, yet slow considerations of arguments (Liu *et al.*, 2019b). As a consequence, decisions based on the experiential system result in "intuitive" decisions, while decisions relying on the rational system make cognitive choices (Dhar and Gorlin, 2013).

Therefore, how to appropriately frame the information processing and decision-making mechanism based on these influences from external and internal considerations is the key question in the further investigation of motivations in behaviour decisions. The dual-process models (Evans, 2018) answers this question by proposing two distinct modes of information processing. The first mode, systematic/rational processing, involves attempts to thoroughly understand all available information through careful attention, deep thinking, and intensive reasoning (e.g., thinking carefully about the arguments presented, the person arguing, and the causes of the person's behaviour). This processing is combined and used to guide subsequent attitudes, judgments, and behaviours. For instance, a systematic approach to thinking about a proposed economic policy might involve reading as many magazines and newspaper reports as possible to learn and develop an opinion about the so-called best course of action for the economy. The heuristic-systematic model suggests that such systematic thinking entails a relatively high degree of mental effort, and thus requires that a person can both devote a certain amount of attention to thinking about the issue, and also wants to devote this attention (Dhar and Gorlin, 2013). Thus, systematic processing is unlikely to occur unless a person is both able and motivated to do so.

Besides, heuristic/affective processing is much less demanding in terms of the mental work required and much less dependent on having the ability (e.g., enough knowledge and time) to think carefully about information (Evans, 2018).

In fact, heuristic/affective processing can be viewed as relatively automatic because it can occur even when people are not motivated and able to deliberately think about a topic. Heuristic processing involves focusing on easily noticed and easily understood cues, such as source credentials (e.g., expert versus nonexpert), source identities (e.g., Democrat or Republican), the number of arguments (many or few), and audience reactions (positive or negative). These cues are linked to well-learned, everyday decision rules known as heuristics (Chen and Chaiken, 1999). Moreover, they can be used with or without self-conscious. People may consciously decide to invoke a heuristic in order to inform a subsequent judgment, but heuristics can also influence judgments without intention or self-awareness (Todorov *et al.*, 2002). Examples of heuristics include "experts know best," "my own group can be trusted," "argument length equals argument strength," and "consensus implies correctness." These simple, intuitive rules allow people to form decisions quickly and efficiently, simply based on easily noticed cues, and with little critical thinking (Todorov *et al.*, 2002). In other words, heuristic thinking is what individuals do when they do not think about something thoroughly and want to make a reasonable decision as quickly as possible.

The models further proposed that two principles act in conjunction to determine the mode and extent of information processing that occurs in any given context (Chaiken, 1980, 1987). The model's least effort principle reflects the assumption that individuals try to arrive at attitudinal decisions as efficiently as possible. Thus, all else equal, people should tend to prefer a less effortful mode of processing (i.e., heuristic processing) to one that requires more time and cognitive resources (i.e., systematic processing) (Evans, 2018). Meanwhile, however, the sufficiency principle asserts that individuals are sometimes motivated to exert additional cognitive effort in order to reach a certain level of judgmental confidence (Shi *et al.*, 2018). They must therefore balance the two processing systems with the desire to satisfy their motivational concerns, such as the goal to reach an accurate conclusion (Chaiken and Maheswaran, 1994). The dual-process models suggests that this balance point is determined by a sufficiency threshold, defined as the degree of confidence to which an individual aspires in a given judgmental situation (Eagly and Chaiken, 1993). Together, the

least effort and sufficiency principles suggest individuals will engage in systematic processing if the less effortful heuristic mode does not yield sufficient judgmental confidence (Meng and Choi, 2019). Systematic processing will therefore be increased by factors that make individuals believe there is a necessity or the outcome of decision need deliberate thinking (Evans, 2018).

Specifically, by summarizing the past findings in related factors in both heuristic and systematic processing, two dual-process models of persuasion independently emerged from this context, namely the heuristic-systematic model (Chen and Chaiken, 1999) and the elaboration-likelihood model (Petty and Cacioppo, 1986). Both provided an organizing framework for understanding the impact of various persuasion variables by suggesting two routes to persuasion, the heuristic or peripheral route, and the systematic or central route. However, they differed in some important ways. For instance, whereas the ELM assumed that the peripheral and central routes to persuasion were mutually exclusive, the heuristic-systematic model suggested that they could co-occur and even interact (Evans, 2018). Thus, although many of the initial dual-process studies of persuasion suggested that heuristic cues do not impact attitudes when people are motivated and able to process systematically (Chaiken, 1980; Petty and Cacioppo, 1986), the heuristic-systematic model suggested that this pattern was only one possible outcome of the two modes of information processing.

Specifically, these results seemed to represent cases in which systematic processing attenuated the judgmental impact of heuristic processing because it took into account information that contradicted the valence of the available heuristic cues (Chaiken and Maheswaran, 1994). If systematic processing instead yielded information that was congruent with heuristic processing, the heuristic-systematic model suggested an additivity hypothesis whereby heuristic processing could exert a direct effect on judgment over and above the impact of systematic processing. Supporting this hypothesis, Todorov *et al.* (2002) found that when heuristic cues and message content were congruent, attitude change was mediated by both heuristic and systematic processing. Importantly, however, the heuristic-systematic model proposed that the two processes could not only co-occur, but could also interact to exert interdependent effects on judgment (Eagly and Chaiken, 1993). Specifically, heuristic processing could bias

systematic processing by influencing people's expectations about the validity of arguments presented in a persuasive appeal (Chaiken, 1987).

Moreover, the dynamics of two competing systems in a dual-process model are often ignored in existing studies, the most common pattern observed in past research often takes the assumption that the two systems function as two stable pathways that will not change under different situations (Ou *et al.*, 2016; Evans, 2018; De Neys and Pennycook, 2019). However, this is not always true, and conflicts are widely identified from existing literature that sometimes one pathway will lose its power in driving individual's behaviour, or its influence will be largely reduced for some circumstances (Watts, 2015; Aivazpour *et al.*, 2017; Wang *et al.*, 2019). Moreover, the key mechanisms in producing these phenomena are also extensively discussed in recent studies.

Some believed that the changes of competing systems are caused by the vanish of contributing factors for certain systems, then its influence will be weakened due to the lack of contributions of its antecedents (Dhar and Gorlin, 2013). This stream of research argued that the capacity and relative ratio of the two systems is fixed for individuals, and the change of dynamic in dual-process models is solely because the resources of their influencing powers are limited or restrained, therefore its weight is seemingly decreased compared with the other route.

Besides, another proposal claimed in existing studies about the dynamic of dual-process models focuses more on the regulatory mechanism that directly functions on two competing systems, and this stream matches with the theoretical proposition that the dominance of two systems is dynamically manipulated by some reflection-based factors (Evans, 2018; De Neys and Pennycook, 2019). These reflection-based factors include the feel of right, confidence in decision, and the importance of the decision. They share some common characteristics like they all represent a feedback system to judge if more thinking or resources should be devoted in the information processing to generate a "better" solution (Aivazpour *et al.*, 2017; De Neys and Pennycook, 2019). In addition, they are also acting as a bridge or channel to link the two processing systems in specific sequences. Through a strong intervention imposed by these reflection-based factors, the different information or cues that are involved in either the rational or impulsive system will be linked and

processed together (Watts, 2015; De Neys and Pennycook, 2019). Consequently, the final decision for the behaviour will be the mixed consideration on the unified information, thus will manipulate the ratio of influence between two systems.

However, the debate is still going in recent studies, and its influence in the context of location-based information sharing is still lacking. Moreover, due to the various propositions on the antecedents of sharing behaviours and conflict findings for the external factors, it is essential to investigate this dynamic within the topic of dual-process models.

2.2.2 Behaviour-level Dual-process Model

Furthermore, when past studies about dual-process models are reviewed together, it is clearly that most of them are concerned about the validity checking and the trust issues toward specific content that are exposed (Evans, 2007; Ou *et al.*, 2016; Evans, 2018). This pattern may be caused by the popularity of the two most used models in dual-process models, HSM and ELM, are both proposed to explain the variations in individual's attitude change based on the two process systems (De Neys and Pennycook, 2019). For example, the most iconic type of studies in this stream is the ones that investigate the effects of both argument quality and source quality on the perceived helpfulness of related information (Moore, 2015). The scope of these studies is limited to the attitude change, since both the ELM and HSM are designed to solve problems for the persuasion purpose (Pennycook, 2017). However, the gap between the attitude and actual behaviour have been attached increasing importance in provide practical impacts in recent studies, and the abovementioned privacy paradox is one of them (Wattanacharoensil and La-ornual, 2019). Thus, in order to fill this gap and to explore the differences between the attitude- and behaviour-level dual-process models, various studies have been conducted to investigate the critical factors in terms of interaction modes, inputs, processes, and moderation factors within the model (Pennycook, 2017; Evans, 2018; De Neys and Pennycook, 2019). The details about the comparison between the attitude- and behaviour-level of dual-process models are listed in Table 2.2.

Firstly, for the behaviour explanation, psychologists have long been interested in the tension between human impulse and self-control, beginning with Freud (1961) discussions on the internal-self related issues, the impulses and the self-constrained thoughts are brought to the frontier of academic discussions. Strack and Deutsch (2004) proposed a comprehensive Reflective-Intuitive Model (RIM) dual system model of from the scope of individual behaviour that integrates many past theoretical antecedents, mainly from social psychology. Specifically, this model suggests that stimuli, conceptual content, and behavioural schema are connected, and also emphasizes the link between affective reactions evoked by objects and ensuing responses (Strack and Deutsch, 2006).

Table 2.2 The Comparison between Attitude- and Behaviour-level Dual-Process Models

	Persuasion and attitude change	**Individual behaviour**
Model [Structure]	Elaboration Likelihood (ELM) & Heuristic vs. Systematic (HSM)	Reflective-Impulsive (RIM) & Hot/Cool
Inputs	Information and cues	Information and internal (imagination) or external (perception) stimuli or cues
Process/ System 1	Automatic associations; reliance on salient cues and easily accessible information/heuristics (e.g., source attractiveness, message length, design, and aesthetics)	Automatic activation of content (conceptual and affective clusters), leading to approach or avoidance
Process/ System 2	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, comparison, planning and choice (e.g., evaluating desirability and feasibility; purchasing intentions)
Output	Attitudes	Behaviours
Situational conditions and moderators affecting processing	Counter-factual thinking Regulatory focus Cognitive load, time pressure Involvement Relevance Arousal Mood	Regulatory focus Habit Cognitive load, time pressure Involvement Accountability Visceral states Need deprivation Regulatory focus Priming Mood

The RIM suggests that behavioural processes are integrated into affective and cognitive structures (Strack and Deutsch, 2006). In the impulsive system, the received external cues will not only evoke conceptual and affective perceptions, but also activate behavioural schema (Evans, 2010). Correspondingly, in the rule-based, flexible, and slowly operating reflective system outlined by Strack and Deutsch (2004), the desirability and feasibility of a behaviour are evaluated consciously. This system has a regulatory function that relies on planning and putting intention into action. As it is more easily disrupted by other processes, its operation is also subject to the availability of cognitive resources (Evans and Frankish, 2009). In terms of the interactions between two systems, Strack and Deutsch (2004) propose that impulsive and reflective processes often operate in parallel and jointly influence behaviour. Thus, the RIM is an approach to dual processing that resembles a parallel-competitive form (Evans, 2007).

Notably, one of the main distinctions that RIM differs from the attitude-level dual process models is the processing mechanisms in both systems that lead to the final outcomes (i.e., attitudes or behaviours) (Evans, 2018). And as the core focus of all dual-process models, the perceptions during the processing period are important in balancing the two systems, since the outcome are hinged on these mechanisms (Pennycook, 2017). Also, to incorporate the duality characteristic of two processing styles, these perceptions are often discussed in both explicit and implicit attitudes toward the information (Evans and Frankish, 2009). In traditional dual-process models related to attitude changes, the relationship is as simple as those implicit attitudes are automatic, and explicit attitudes necessitate capacity and motivation to think, and their influences are effective through the embedded norms, logics, and concept links etc. at the present (Wilson et al. 2000). However, for the behaviour-level dual-process models like RIM, although the main processes are similar, the links between the attitude and the outcome are largely explained from the formation of behaviours. In the RIM, behavioural schema is learned implicitly and activated through experience (Strack and Deutsch, 2006). Past research indeed suggests a relationship between implicit attitudes and spontaneous behaviours (Rydell and McConnell 2006). On an explicit level, attitudes towards brands have been shown to influence intentions to purchase, and these findings have been applied

in many other areas like information sharing and volunteer activities (Spears and Singh 2004). There is emerging evidence supporting a relationship between explicit attitudes and reflective behaviours, on the one hand, and implicit attitudes and impulsive behaviours on the other.

2.3 Place Attachment Theory

Although the definition of location is usually subordinated to the notion of place, location and place are not the same thing (Cresswell, 2004). Location is more specific than place. Place is made up of a number of things that can be specifically located (Relph, 1976). In everyday language people usually use the word place to refer to a location (Cresswell, 2004). However, a place is not just the where of something, it is the location plus everything that occupies that location seen as an integrated and meaningful phenomenon. A meaningful location can also be understood by its sense of place, since it means the subjective and emotional attachment people have to place (Relph, 1976). Place attachment is a multi-faceted concept and defined as the bonding that occurs between individuals and their meaningful environments (Scannell and Gifford, 2010). Central to the concept of place attachment are affect, emotion and feeling (Altman and Low 1992). For some scholars, place attachment is a sub-concept of sense of place (Scannell and Gifford 2010). Sense of place is usually associated with the identity of a place and people's self-identifications with and within that place. It is not only about a positive/negative feeling for a place, but also derived from the totality of one's individual life (Wang and Xu, 2015). It lies within the existential relationship to the world and can take various forms based on individual perception. Relph (1976) discussed that the most basic meaning of sense of place is the ability to recognize different places and different identities of place. Identity of a place provides an individuality to a place in comparison to other places as separable entities and allows a specific place to gain some distinction (Lynch, 1960). Since the location of a particular place is distinct from that of others, locational information can be one element that is used to identify different places.

Place attachment, the cognitive-emotional bonds between individuals or groups and their important places (Altman and Low, 2012; Mihaylov and Perkins, 2014), continues to attract widespread interest across disciplines (Turton, 2016).

It originates from the transformation process from the traditional concept of space to meaningful places for individuals, as reviewed before, and an example of this transformation is presented in Figure 2.5 which is adopted from Goel *et al.* (2011). It can be seen from this process that the attachment towards specific places is not only depends solely on the sensory inputs, but also developed through meaningful interactions with these inputs provided by the place. Such activities could be seeing familiar objects, smelling scents from the past, or revisiting a space so many times to make it a habit (Di Masso *et al.*, 2017). To this end, the place has been regarded as a carrier of this special attachment, through providing meaningful sensory signals (Hidalgo and Hernandez, 2001). And clearly, the place attachment, although should be developed within specific places, but should not be restrained to the place it is generated, as long as it could provide clues that may raise the meaningful attitude of individuals (Chen *et al.*, 2014). In addition, the object this attachment associated with could even not possess a physical form, as in Goel *et al.* (2011), which applied place attachment in the virtual worlds, has proven that this bonding could be built toward any form of places if it is perceived as capable to provide place-related signals.

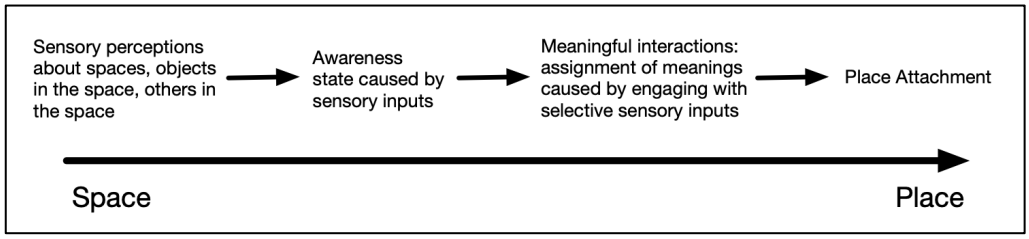

Figure 2.4 Process of Place Attachment, adopted from Goel et al. (2011)

2.3.1 Influences of Place Attachment

Recent work has identified new processes and types (Lewicka, 2013), antecedents (Dwyer *et al.*, 2019), mediators and moderators (Ramkissoon and Mavondo, 2015), and outcomes of place attachment (Sullivan and Young, 2020). The understanding of place attachment might be furthered by considering more established theories of human bonding, to determine which elements apply to person-place bonds. Specifically, interpersonal attachment theory proposed by Ainsworth (1979) has contributed to, and may continue to inspire place

attachment research. It further delineated individual differences in attachment, called attachment styles. Since these seminal works appeared, attachment theory has remained prominent across various sub-disciplines of psychology and has made contributions to counselling, social work, and other areas of practice (Holmes, 2014).

Some commonalities between the two theories have been identified (Morgan, 2010). Place attachment appears to present comparable psychological processes to those of interpersonal attachment but that differs somewhat in how they are expressed (Kyle *et al.*, 2004). Proximity-seeking is a hallmark of interpersonal attachment processes that is also exhibited toward places, such as when individuals elect to live in a place or spend time there (Dwyer *et al.*, 2019). People may revisit certain travel destinations with where they believe to have special bonding (Dwyer *et al.*, 2007). Some religious groups incorporate pilgrimages as a way of maintaining proximity to sacred spaces (Ruback *et al.*, 2008). Even when a place is not physically proximal, the benefits of proximity can be achieved through visualization. Drawing on experimental methods from interpersonal attachment research, participants who visualized a place of attachment (as compared to a neutral place) reported greater current levels of self-esteem, belongingness, and meaningfulness following the visualization (Scannell and Gifford, 2017a).

Although most research highlights the benefits of proximity-seeking to place, researchers also recognize that person-place bonds are not always positively built, it can also be negative or ambivalent (Roster *et al.*, 2016), and can sometimes even pose danger. A systematic review focusing on place attachment revealed that individuals who are strongly attached to specific locations are less willing to evacuate or relocate in the face of risks, and are more likely to return following disasters, even when risks remain (Bonaiuto *et al.*, 2016). Similarly, proximity to an interpersonal attachment figure is not always adaptive, such as when the attachment figure is abusive, or when attachment anxiety prevents broader exploration of the environment (Turton, 2016).

Generally, however, the purpose of proximity-seeking is to access a safe haven (Gustafson, 2001). In the case of place attachment, this occurs when using a place to retreat from threats, problem-solve, and gain emotional relief

(Gustafson, 2001). This has been demonstrated in various samples such as children who retreat to favourite places to regulate their emotions (Korpela *et al.*, 2002) and adults who recognize safety and security as one of the primary benefits of their important places (Scannell and Gifford, 2017b). Along these lines, place attachment appears to co-vary with increased perceptions of safety; individuals who are more attached to their neighbourhoods and homes tend to perceive them as safer than do others who are less attached (Kyle *et al.*, 2004). The safe-haven function of place attachment may be especially important for marginalized groups and individuals who face numerous stressors in their everyday lives (Fried, 2000). However, the structures that create and maintain comfortable places for dominant groups can limit the ability of those who are less powerful to access safe havens (Anguelovski, 2013). For example, safety may be more elusive for some groups, given housing instability, lack of control of resources, and greater exposure to stressful living conditions in low-income settings, such as noise, pollution, violence, and stigma. On the other hand, marginalized groups can also seek, create, and re-appropriate spaces wherein they can achieve a sense of safety and freedom (Anguelovski, 2013).

Moreover, place attachment also occurs when the attachment figure serves as an object that promotes exploration (Turton, 2016). Places of attachment can provide a reference point and anchor for wider expeditions (Fried, 2000), or they can serve as the object of the exploration itself, such as when individuals form attachments to interesting travel destinations or utilize a place to escape from daily routines (Dwyer *et al.*, 2019). Place attachment-supported exploration can occur at a group level, such as when a strong sense of nationalism contributes to quests to explore terrestrial environments and beyond, as is seen in the history of space exploration (Raymond *et al.*, 2010). Unlike an interpersonal attachment figure, places of attachment should not be assumed to be stable or fixed entities from which exploration can be launched; rather, place attachment can also include both fixed (i.e., stasis, and rootedness) and fluid (i.e., changing, moving, and relational) aspects that can be configured in various ways (Di Masso *et al.*, 2019).

However, although past studies have extensively used place attachment to investigate people's behaviour, it is still criticized by terms like slow, unclear,

stuck, lack of theory, little empirical progress (Lewicka, 2013) and these concerns were shared by other authors (Scannell and Gifford, 2010). Unfortunately, the substantial increase in the scientific production related to the study of the bonds between humans and places has not been accompanied enough by advances in the theoretical and empirical aspects (Ujang and Zakariya, 2015). Most researchers agreed that the main reason behind this lack of progress is the proliferation of concepts and measurements proposed for characterizing emotional bonds between humans and places (Altman and Low, 2012). Topophilia, rootedness, place dependence, place identity, urban identity, place attachment, sense of place, sense of community, or community attachment are examples of the wide array of existing terms (Turton, 2016; Scannell and Gifford, 2017a; Di Masso *et al.*, 2017; Dwyer *et al.*, 2019; Hesari *et al.*, 2019). Twenty years ago, this terminological and conceptual chaos led Giuliani (2003) to state that the most important challenge for researchers in this area of inquiry is to integrate different viewpoints and approaches.

2.3.2 Place Attachment and Location-based Information

Incorporating more recent research into the place attachment, it can be easily found that the diversity regarding the conceptualization of place attachment and related phenomena is maintained (Droseltis and Vignoles, 2010; Bonaiuto *et al.*, 2016; Morgan, 2010; Scannell and Gifford, 2010). This variety illustrates the plurality of concepts that researchers in the field must manage. To begin with, past studies extensively focused on fixity and the value of rootedness in the concept of place attachment (Hernández *et al.*, 2007). It has been assumed that people value stable relations with their places of residence, and that disruption of this relation is a cause of psychological disturbances, equally severe as disruption of the relationship with a loved one (Fullilove, 1996). These findings were difficult to reconcile with the new paradigm that assumed that mobility is a norm rather than exception in human life (Di Masso *et al.*, 2019).

The expansion of cities and the rapid pace that cities update their environments have challenged individuals' perception toward where they live. Unlike people in old times that are all familiar with every detail of the local environment, they are now relying heavily on services, platforms, and applications to get local knowledge around them. Moreover, the ever-changing surroundings of the city

have restrained individuals in knowing the nearby updates, while kept individuals continuously interested in exploring the city. Besides, Internet connection and virtual mobility may insert a paradoxical effect on people's residential mobility, as it may decrease the propensity for physical movements (Di Masso *et al.*, 2019). Easy access to internet-based communication over long distances, increased popularity of mobile network, distance learning instead of physical school attendance, or video conferences that replace physical presence, all this may make radical changes of the residence place unnecessary (Roos Breines *et al.*, 2019).

All of these taken into account, it seems that the future of the studies that relate place attachment should perhaps focus also on the effects of the exposure to other products of networked world (Guha and Birnholtz, 2013). Physical mobility and communication technologies have altered the perception of space and time. They influence the way people perceive distances as shrinking or increasing (Giddens, 1991), by providing the users of these technologies with a possibility of communication while on the move. Mobile communication technologies that rooted on location-based information foster attachment to places by creating a renewed interest in location (Goh *et al.*, 2007). Networking and mobile technologies can only contribute to material, social and cultural reconfigurations of places and distances, and therefore they have the potential to influence what a place represents and how people attached with them digitally (Di Masso *et al.*, 2019).

Specifically, research on mobile communication has focused on changes in social and spatial practices of everyday life (Campbell and Ling, 2009). Mobile technologies are questioned concerning the large extent to which they blur the lines between public and private space, work and personal life, and coordinate for social networking (Campbell and Ling, 2009; Humphreys, 2010). With locative media, the focus of research has shifted towards the analysis of location-based information and their usages in everyday life (De Souza e Silva and Sutko, 2011; Humphreys, 2007). Although recent works explain locative media use in relation to theories of space (Gordon and e Silva, 2011), further empirical study is needed to explore how people actually use location-based information in everyday life.

Although location has been conceptualized as an aspect of place, and an important attribute of many practices in everyday life, sharing the location of any place does not turn places into locations, nor can locations simply be turned into places (De Souza e Silva and Frith, 2010). When user's check-in at a place, they actually share their memories and understandings of those places, along with the virtual understanding of those places. Naturally, this has started the discussion on how place attachment is constructed upon virtual locations (Manzo and Devine-Wright, 2013). This interaction between physical and mediated perception of location have drawn extensive attentions from researchers (Hiller and Franz, 2004). Using technologies like digital photos, location-based social platforms, and social media, individuals could stay in touch with locations despite being physically far away, and the connection facilitated by mobile technologies could extend the scope of place attachment to multiple locations (Barcus and Brunn, 2010). Specifically, this bonds with virtual places could also generate similar effects with the attachment to real locations. As Hiller and Franz (2004) stated, the location-based information about the hometown that individuals perceived through television, email, and Internet could stimulate a sense of local belonging when they are away from home. And the easy access to virtual locations could also help individuals to pay a return visit when they are physically impossible to do so, and this has been summarized by Barcus and Brunn (2010) as place elasticity.

Particularly, the location-based information in everyday life can lead to false perceptions of decreasing importance of place and location (Moores, 2012). This is due to a general representation of mobility as opposite from place (Relph, 1976). Mobility is usually associated with detachment from places, placelessness or no sense of place, since mobility has been associated with a lack of connection and commitment (Urry, 2000). The popularity of communication technologies has often also contributed to the feelings that distance and location information would lose their importance and detach us from place because they trigger physical mobility (Wilson and Valacich, 2012). As Meyrowitz (2005) states, travel is more easily managed as distant places seem less strange and less dangerous and as contacts with those back home can be maintained. As argued by Gustafson (2001), increased mobility, information technologies and

consumer society, combined, have been blamed for accelerating erosion of places. However, attachment to places always exists no matter how mobile users become, because mobility can also be understood as a way of finding meaning and ways to places and belonging. Location-based information increases our chances to attach to new places, while helping us maintain old attachments (Moores, 2012). On the other hand, it allows its users to detach from places and co-present situations willingly in order to experience different aspects of spatial environment (Gordon and e Silva, 2011).

Today, cities contain information from various networks, of both people and devices, and what a place is nowadays actually well beyond what it is physically (Gordon and e Silva, 2011). Through the constructed social norms toward specific location-based information, users can assign meanings to places by attaching geo-tagged information which others can access when they are nearby (de Souza e Silva and Frith 2012). This enhances the awareness of multiple meanings of places, as users can explore many aspects of a city that are not explicitly there in its visible physical fabric. In some cases, this use of location information may allow users of mobile communication technologies to create and share their own genuine experiences of places and to bring different senses of places into conversation (Humphreys, 2007), creating new forms of attachment to places. Therefore, location-based information afford and renew attachment to places (Di Masso *et al.*, 2019). In this way, this kind of information not only keep individuals connected with geographical locations, they also provide virtual settings around the location for users (Gieryn, 2000). Although these settings were normally overlooked in past studies and were rarely seen as places, they are believed to support a parallel between the real and virtual locations. Adams (1998) stated that the expression that individual makes to refer to real locations are closely related to the virtual settings and important in understanding the meaning of related behaviours. In addition, the Internet has created communities with a sense of togetherness, engagement of cultural customs, and in-group communication, and all these feature could make up to an attachment to places (Skop and Adams, 2009). By communicating through virtual settings, individuals could overcome the physical separation and form a sense of identity with corresponding information (Skop and Adams, 2009).

Moreover, location-based information plays a crucial role in constructing and reconstructing senses of place. In agreement with Cresswell (2004) argues that places are meaningful locations. This line of thought degrades the importance of pure locational information in place-making while prioritizing other aspects of place attachment, such as cultural and emotional meanings. On the other hand, with mobile and locative media use, location became more discernible and important as a feature of place. As the sharing of location-based information started to acquire dynamic meanings with the use of social media (De Souza e Silva and Frith, 2010), statements or markers of location began to contribute to the sense of a place. As a result, places acquire different meanings, not only for the ones who share locational information but also for those who receive it. Hence, location-based information is an important attribute of a place, influencing place-making and understanding of places.

2.3.3 Components in Place Attachment

As noted in past studies, place is a set of spaces transformed into a meaningful location through peoples' experiences and ideas (Cresswell, 2004; Dwyer *et al.*, 2019; Di Masso *et al.*, 2019; Carmona, 2021). Relph (1976) proposed that place is constructed through three components: physical setting, activities, and meanings, with meaning being arguably the most difficult component to understand. People make places the centre of symbolic meanings, transforming spaces into symbolic landscapes (Moores, 2012; Wang and Xu, 2015; Mehrotra *et al.*, 2017).

The essential question of place meaning the way it influences individuals (Agnew, 2011) and the role of place in their everyday lives (Gustafson, 2001). Research concerned with place has showed that people regard places as a way to define themselves (Uzzell, 1996), thereby developing a place identity (Williams and Vaske, 2003). The values, attitudes, and beliefs about the physical location, along with the direct experiences with the settings support the emergence of the identity associated with the place (Proshansky *et al.*, 1983). However, normally individuals are not aware that memories, feelings, and preferences will influence their responses to the place or how it changes through time, as place identity is developed by thinking and talking about places through

a process of distancing, which allows for reflection and appreciation of place (Proshansky *et al.*, 1983).

Apart from the connection that individuals see place as part of themselves, a place can also become a resource for satisfying goals, creating, in turn, a relationship of dependence (Williams and Vaske, 2003). The focus of place dependence is that individuals value places for their functional attributes in supporting individual goals (Williams and Roggenbuck, 1989). This type of attachment is embodied in the area's physical characteristics and may increase when the place is useful in providing values in self enhancement and material returns (Williams and Vaske, 2003). Stokols and Shumaker (1981) proposed that an individual can become attached to certain types of places for functional reasons, defined as place dependence. An example of how place dependence develops could be a serious leisure participant who can only achieve his or her goals and activities in certain types of areas. Such leisure participant can be attached to places never visited because of the potential of such places to provide unique recreational settings for various purposes.

Individuals' perceptions of place identity and place dependence have been shown to affect various aspects of life. They can influence individuals' pro-environmental behaviour (e.g., Gosling & Williams, 2010; Hernández, Martin, Ruiz, & Hidalgo, 2010) and residents' perceptions of social and environmental conditions in natural settings (Kyle, Graefe, Manning, & Bacon, 2004). Furthermore, these two concept about the relationship between individuals and places are summarized as two dimensions in place attachment by Williams and Vaske (2003). In recent studies, this two-dimensional place attachment model with place identity and place dependence dominates studies in environmental psychology, tourism, and information systems (Ujang and Zakariya, 2015; Bonaiuto *et al.*, 2016; Di Masso *et al.*, 2017; Dwyer *et al.*, 2019; Sullivan and Young, 2020). Therefore, this thesis adopts this model in investigating its influence in individual' decision-making for location-based information sharing.

2.3.4 Social and Physical Place Attachment

Additionally, the discussion on how place attachment emerges through relationships and interactions with places is increasing in recent studies

(Scannell and Gifford, 2017b; Dwyer *et al.*, 2019; Hesari *et al.*, 2019). In this line, Scannell and Gifford (2010) proposed a three-dimensional framework of place attachment intended to integrate and structure the variety of definitions in the literature. The framework treats place attachment as a multidimensional concept originates from person, psychological process, and place dimensions. According to the person dimension, place attachment occurs both at the individual and group levels (Scannell and Gifford, 2010). They define three psychological processes for place attachment: affect (emotion), cognition (identity), and behaviour (action). Also, the place dimension is divided into two levels: social and physical place attachment (Scannell and Gifford, 2010). In this model, place attachment is defined as a bond between an individual or group with a place that varies in terms of spatial level, degree of specificity, and social or physical features of the place, and is manifested through affective, cognitive, and behavioural psychological processes (Scannell and Gifford, 2010).

Based on this framework, many debates have been presented in discussing the factors affecting the place attachment, especially from the perspective of social and physical dimensions. Specifically, the place attachment has been examined at various geographic scales (Altman and Low, 2012), and has typically been divided into social and physical place attachment (Riger and Lavrakas, 1981). Hidalgo and Hernandez (2001) investigated the social and physical place attachment at three different spatial levels, namely home, neighbourhood, and city. They found that the strength of the attachment differs on levels of analysis, and the social dimension of place attachment was stronger than the physical dimension. Riger and Lavrakas (1981) suggested that social attachment depends on the social ties, sense of belonging, and familiarity of surroundings; and physical attachment is predicted by activities, ownership, and future plans.

According to environmental psychology studies, place attachment is necessarily social, and sometimes compared to a sense of community (Gu and Ryan, 2008; Ujang and Zakariya, 2015; Scannell and Gifford, 2017b; Di Masso *et al.*, 2017). Accordingly, two types of community have been distinguished, namely the community of interest, where members are connected through lifestyle and common interests, and community of place, where members are connected through geographical location (Nasar and Julian, 1995). Communities of interest

are not always place bound, but it could still exist in cases of online, hobby, or religious groups that are connected with reference to a place. Community of place is more straightforward, as it describes social ties rooted in place, such as neighbourhoods, coffee shops, or other spaces that support social interaction. Similarly, other researchers assume that attachment to a place means attachment to those who live there and to the social interactions that the place affords them. Lalli (1992) noted that the connection with places becomes important as they can also symbolize the social connections. Thus, social place attachment involves both bonding to the others within the place and the social group that the place represents. The latter type of attachment, which emphasizes that the place symbolizes one's social group, is closely associated with place identity (Twigger-Ross *et al.*, 2003). For example, one is attached to the place could be due to the reason it facilitates distinctiveness from other places, or affirms the specialness of one's group. Furthermore, the place attachment towards the hometown is an instance of group-symbolic place attachment that occurs at the city level (Hidalgo and Hernandez, 2001). Similarly, nationalism is another example of attachment to a place representative of one's group (Bonaiuto *et al.*, 1999). These definitions suggest that social place attachment can sometimes centre upon the place as an arena for social interactions, or as a symbol for one's social group.

Besides the social factors, attachment can also rest on the physical features of the place. For instance, the definition of place dependence highlights the physical characteristics of a place as central to attachment because it provides resources to support one's goals (Stokols and Shumaker, 1981). The types of places that individuals find meaningful could represent a broad range of physical settings, from built environments, decorations, to broader concept of cultures and layouts (Manzo and Devine-Wright, 2013).

The level of specificity of the physical attachment is important. The perception toward physical attributes of places could be divided into several levels of abstraction. For example, a study by Williams and Vaske (2003) found that, compared with individuals that are fond of natural in general, those with greater place-specific attachment were less willing to visit other wilderness areas. This indicates that although both attachments to a specific natural site appear to drive

individuals' behaviour similarly, the origins of them comes from different sources: one is non-substitutive regarding to the specific place, because it is caused by the exact place; and the other is transferable to other similar places, since it is based on a broad concept that elicited by the place.

In the same vein, the meaning-mediated model of place attachment (Stedman, 2003) proposes that individuals is not directly attached to the physical features of a place, but to the meaning that those features represent. The physical aspects constrain the possible meanings a place may adopt, and correspondingly, place attachment rests in these symbolic meanings afforded by the physical settings. For instance, Knez (2005) proposed that climate is a significant physical feature that influences individual's place attachment, especially when it resembles the climate of one's childhood. The reason for this relationship is due to the symbolic associations afforded by the physical climate in representing one's past.

To summarize, the place attachment has been widely used in the area of tourism, environmental psychology, and information systems, the two main dimensions (i.e., place identity and place dependence) are widely explored in past studies in terms of information processing (Goel *et al.*, 2011), stimulus (Di Masso *et al.*, 2019), and levels of analysis (Raymond *et al.*, 2010). Emphasis on a separation between social and physical features has also been proposed in past studies, as an important direction in discussions about the influence of place attachment (Scannell and Gifford, 2010). Thus, what factors could be affected by both social and physical features, and how would be they be influenced in various contexts are the key to this thesis.

2.4 Physical and Social Contexts in Location-based Information

Location-based information on most popular social media appears mainly in two distinct layers: the coordinates of the location and the name of the venue or place (Koeppel, 2000). Obviously, the added information of the latter form enables the content to be a semantic representative in transferring social-oriented messages, and makes it more interesting for audience to discuss (Frith, 2014). Particularly, the message delivered to the audience can be perceived as supporting information about user's casual behaviours, such as entertainment, and dining, as well as descriptive information to display the functionality of the

venue, like office, and school (Mehrotra *et al.*, 2017). However, the venue names are not always effective in delivering the complete context or exact meaning behind the shared content. Indeed, some of the famous venues and places are able to self-explain the symbolic and clear meaning of the content (e.g., the Eiffel Tower), most of other trivial places do not have this influence to be recognized and perceived correctly directly from the venue name (Cramer *et al.*, 2011). Thus, the context of the location-based information sharing is extremely important to provide clues and evidence for audience to infer the expected message that the shared content would like to pass (Evans and Saker, 2017).

The most obvious and direct strategy that users adopt in providing context information is through the textual content associated with the location information. For example, when people want to share places like restaurants that they are having dinner at, they might probably use words like dining, dishes, or services when they share the information on social media (Kang and Namkung, 2016). A good example could be found in Figure 2.1 to show the common content on one of the most popular location-based platforms – Foursquare. The assumption that there is strong link between the textual information and location-based information has been widely accepted and proved in previous investigations on social media (Zhu *et al.*, 2010; Ou *et al.*, 2016; Yao *et al.*, 2018). Some huge platforms like Twitter are found on which text messages have been leveraged widely to infer social or functional properties of locations for a range of purposes (Kim *et al.*, 2013; Tang and Liu, 2010). Yet, due to the variance in the culture and individual differences, the communication among online users is considered rather complicated, and the reliability and validity of the process during the message delivery through location information are often challenged in past studies (Yao *et al.*, 2018). Besides, through incorporating the factors from other sources like individual characteristics, place features, and implicit meanings, recent studies have identified more links between the contextualized variables (Zhu *et al.*, 2010).

Therefore, it is necessary to investigate the relationships between the location-based information with its contexts, and their influences on the final sharing behaviours. Naturally, the main aim of most social media platforms is to facilitate interactions among users through varied forms of information (Fuchs,

2021). No matter on social networking sites like Twitter and Facebook or location-based social network platforms like Foursquare, the potential value of implicit context information attached with the location-based information is often overlooked (Zhu *et al.*, 2010).

Figure 2.5 An Example of Restaurant Sharing on Foursquare

The supplementary function of associated information has been a hot topic in this area and was studied extensively from the perspective of both senders and receivers. Take the example of textual information, needless to say that traditional social networking sites has more than half of its shared location-based information associated with additional content like texts, photos, and tags (Wu *et al.*, 2018). Aside of the optional user-generated messages, the locational information provided by most current social networking sites has been enriched by a mandatory semantic description of available places through predefined categories (Wang *et al.*, 2014). Similarly, to the thematic dimensions of the OpenStreetMap project (Mocnik *et al.*, 2017), the venue categories provided in these social networking sites are generated by users. Then, under the management and analysis of the platform, these trivial tags or descriptions are organized into a predefined categorization hierarchy which allows users to select from. In this way, the well-organized information of venue categories provides a-priori semantic knowledge, which can be used to validate the identified

semantic concepts that matches with the shared location context (Saker and Evans, 2016). This increases the platform's ability in providing recognized messages for complicated location information, and also helps users to better share location-based information with minimum concerns (Lindqvist *et al.*, 2011).

However, these functions are all parts of reflections in the place meanings (Raymond *et al.*, 2017), or sense of place, which are constructed beyond the objective descriptions. The sense of place relies on a high level of intellectual abstraction of cognitions, beliefs, attitudes, or other mental representations about the physical, social, or personal qualities of a setting (Vanclay, 2008). For example, (Williams and Vaske, 2003) discusses four layers of place meaning: inherent, instrumental, socio-cultural, and identity expressive. Places can have instrumental meanings associated with their material properties that contribute to desired social or economic goals. They can have socio-cultural meaning which recognizes that places can be socially or symbolically constructed within the cultural, historical, and geographical contexts of day-to-day life (Gustafson, 2001). The identity-expressive layer focuses on how individuals become attracted to and attached to place because those places possess intangible emotional, symbolic, and spiritual meaning.

However, the motivation that these contexts have caused was regarded as more influential during the decision-making process of location information sharing (Daugherty *et al.*, 2008). Moreover, although not mentioned clearly, these context-related factors are widely discussed among two main categories: the physical and social contexts (Evans and Saker, 2017).

2.4.1 Physical Contexts in Location-based Information

The physical context concerns more about the space that associated with the location-based information. The term of space is defined previous by De Certeau and Randall (1984) as 'the order (of whatever kind) in accord with which elements are distributed in relationships of coexistence'. From the definition itself, it is obviously that the space is used to describe the physical connections and links between objects in a particular range of room. From a broader view, the city could also be view as a collection of spaces that were labelled with

different features. As a starting point, Lynch (1960) has constructed a framework which contains five basic elements that people use to construct the meaning of place in the city, namely pathways, edges, districts, nodes, and landmarks. The exact representations of these five elements are illustrated in Figure 2.2. By combining these elements in constructing images of location, they have become the core terms in the portrayal the locations. The differences in five elements between location have been regarded as the main determinants in defining the concept of places (Lynch, 1960). Moreover, following studies have widely adopted these concepts to distinguish varied types of places. For example, the path represents the directions, the edge stands for the separations between neighbours, the district means community, and the landmark could be used as symbols to indicate the identity of the location (Carmona, 2021).

However, in the environment of online social media, the concept of space may need to be updated to suit the new norms on social media. In another word, the geometrics of the place are not as important as what they are in the offline scenario where people can feel the surrounding directly. Compared with physical perceptions of the space, the partly shared and demonstrated location information could possibly bias the experience of the audience (Kyle *et al.*, 2004). Therefore, the added implicit meanings and metaphors by the sharing context on social media are important in understanding how these platforms reshape the ways of people perceive and process location-based information.

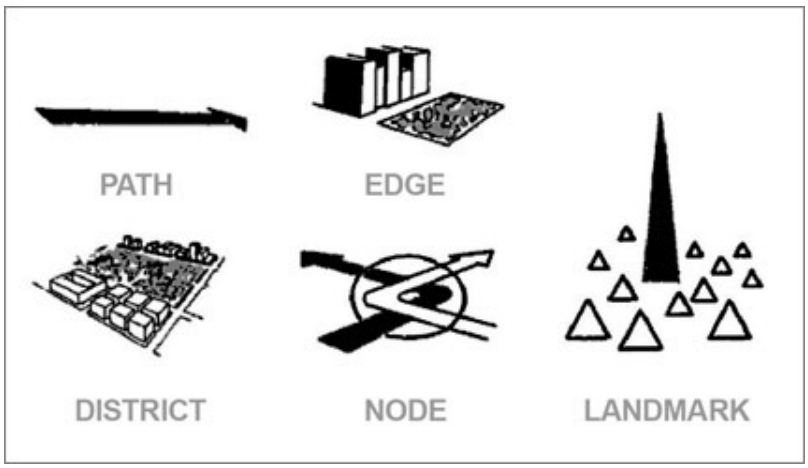

Figure 2.6 Five Elements of Space Proposed by Lynch (1960)

Firstly, from the naïve understanding of the space, it is suggested that the meaning of space should be perceived from three overlapping perspectives: the spatial characteristics, the described space, and the representational space. These three ways in understanding the space are developed based on how people perceive, create, and live in particular locations (Lefebvre and Nicholson-Smith, 1991). And with the movement from the traditional Internet which based on desktops to the current trending mobile network, the ability to continually connect to internet-based services and applications through smartphones and portable devices has attached multi-layer meanings to the physical world. In the study by Humphreys (2010), he found that the usage of the application will shape the way how users feel and conceive the surrounding environment. Specifically, it is proposed that through creating, sharing, and exchanging social and locational information, users will eventually form and feel a sense of community among a group of friends in a public space. Moreover, this feel of community will also be applied to unfamiliar public places, and make people feel they are part of the place even that is the first time they have been there. Furthermore, Humphreys (2010) also found people will frequently change their routes to particular destinations based on the temporal social and spatial information they receive on mobile devices. A common situation that people will change their daily routes is because they found a friend or friends were nearby. These findings support the idea that people are increasingly using mobile social networks to transform the ways they come together and interact in public space (Humphreys, 2010), and that the mobile network has been firmly embedded in people's experience of place (Hjorth, 2008). De Souza e Silva (2006) further claimed that the merging of physical space with digital space has led to the development of 'hybrid spaces. Hybrid spaces produce a sense for users to experience both the digital and the 'real' space, simultaneously. This concept forms an important part of the research surrounding new mobile technologies and location-based applications (Farman, 2020; De Souza e Silva, 2006). This 'hybrid' engagement involves more than interacting with digital information in space, and the message related to a specific location will influence how the information is accessed and contextualized.

Furthermore, if the meaning and experience of space are understood as constructed through use, rather than being predetermined (De Certeau and Randall, 1984), then new metaphors and perceptions to space could emerge from the use of mobile-based applications due to the 'hybrid' spatial engagements they create. The ubiquity of connectivity with mobile communications, the perpetual contact with social ties, the continual potential of accessibility of social ties that creates a continual co-presence (Ling and Horst, 2011). And the possibility of instant interactivity through location-based information with others (Campbell and Kwak, 2011) creates an affordance for the empathy of space experience. Gordon *et al.* (2013) argues that location-based services mediate conceptions of space and geography while contributing to changes in understandings of participation in public activities and events for users.

Moreover, Farman (2020) Merleau-Ponty-inflected approach positions the user as an active part of the mediation of the world with the medium or device, as opposed to a technologically determinist approach that would see understanding of the world shaped by the device. This approach positions information as things that can reconfigure the way that users can re-construct the meaning of space in a co-constitutive way (Farman, 2020). The use of location-based information affects the physical objects like places, but the objects will also rely on digital media to play critical roles in the utilization of mobile media. Most importantly, Farman (2020) confirms that location-based information is reconfiguring the ways in which users can embody space and locate themselves in digital and physical spaces simultaneously.

For Moore (2011), the interaction with location-based information encourages the formation of social groups which tend to surround themselves, and to stress their difference from the common world by disguise or other means. Specifically, this new kind of sense of being apart together (Moore, 2011) was also identified among users when they participate in social activities on platforms. Accordingly, platforms like Foursquare all implemented important social component that aims to emphasize the social functionality through provided services. This feature was not rare, and has been also investigated in the observations in Humphreys (2007, 2010) concerning Dodgeball, which proposed that familiarity toward spaces will be formed by social activities within the place environment,

like check-in and sharing. This also signifies a different kind of spatial relationship in which the interaction with the social associations has become part of the environment and these relationships are located within a sense of communities (Frith, 2014). Through this kind of participation, users are aware of other users that share the same or similar experience at places. And as a by-product of social interactions on the platform, users are willing to frequently re-visit the familiar places to strengthen these bonding, and strategically choose the appropriate destinations to better manage their expected impressions and social links (Guha and Birnholtz, 2013). In turn, the spatial practice of location-based information platforms does not only facilitate the new understanding of space, but also utilize this opportunity to deepen the social connections that comprises these environments.

More importantly, In the context of location-based social media, this is an important point. Location-based information sharing have the potential to transform the meanings attached to day-to-day objects and situations (Wang *et al.*, 2016). A significant part of this transformation is rooted in locative interactions, and has significantly changed the so-called ordinary life, which is understood as the aggregation of trivial events every day. Likewise, these spatial experiences similarly involve a combination of direct and mediated perceptions, which enables an embodied media that will influence the experiences detailed previously. Not only does location-based information suggest an updated understanding of social interactions, which has successfully mitigated the gaps between distinct experience and ordinary life (Caillois, 2001), it also suggests the possibility of new approaches to location which are realized through a confluence of physical and digital space.

In conclusion, for the changes that mobile network has brought to ordinary people, the first significant phenomenon is that the pervasive power associated with location-based information served to motivate users to spend more time interacting with their surroundings rather than simply staying unmoved. The real importance of this new kind of engagement with surroundings is the various ways in which the people's ordinary life can be displayed and overlaid with additional meanings that brings pleasure and social interactions for them (Lundquist *et al.*, 2014). The transformation posed by the mobile network which

led to the fusion of distinctiveness and ordinary lives involved both the everyday objects and common spaces and places that have being granted with new meanings through the novel communication style emerged with location-based information. Besides, the communication through location information may also drive users to visit places that they either not familiar with or not aware if before. For the most part, under the surface behaviours of active participation, such as check-ins and badge earning, these activities are strongly motivated by the associated social interactions and the co-constitution of mutual understandings of the place (Lindqvist *et al.*, 2011). Finally, past studies demonstrated that the locative interaction among users can deepen the social ties users experience in conjunction with the everyday space that comprises their day-to-day routines and surroundings. Through various ways to interact and display the locative information, location-based information sharing not only allowed users to establish a more personal connection to their surroundings, but also offered the possibility of a deeper sense of sociability through the socio-spatial transformation of locative interaction in their everyday surroundings.

2.4.2 Social Contexts in Location-based Information

As for the social contexts in location-based information, the last decade was regarded as the observer of rapid change of people's lifestyle (Farman, 2020). The continual connectivity of mobile devices has facilitated the emergence of the 'mobile web', where services once limited to the desktop become mobile and where the active facets of mobility are also reflected in the services afforded to mobile devices (Farman, 2020). One of the most important effects of this is how location-based services has given rise to new embodied experiences and social connections facilitated by computation, in places where this was previously impossible.

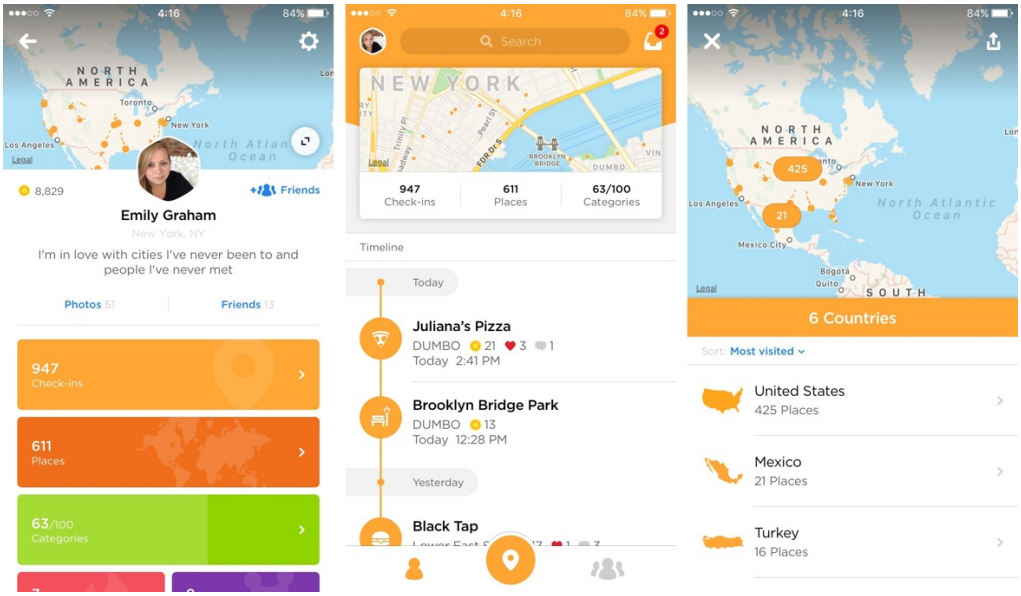

Figure 2.7 Digital Archive of Past Check-ins on Foursquare

Firstly, the locative information is primarily used to mark physical presence in a place at a particular time, checking-in at a place may lead to the display of a visible relationship, which may then be employed by certain users as a symbolic way to mark their connections to the places they most often visit (Wang, 2013). Perhaps a user might use a check-in to confirm the authenticity of their relationship to a place, such as repeated check-ins to the city's football team venues. In doing this, check-ins can also become a method or mode of continuing an identity project (Wang and Xu, 2015). In this kind of activity, users may alter the venues that they choose to visit or check in at according to their own reflexive understanding of themselves. Then, users learned to check in to places in order to document their day-to-day movements with tags that labelled by location-based information (Moores, 2012). This activity forms a digital archive of the movements of the user that can be reviewed in the future, shared in the present and planned in the past (Wang and Stefanone, 2013). This archive becomes a digital record that can be further enhanced with images, text about the event or feelings on the place or simply a timestamp that contextualizes the location temporally (Moores, 2012). The sharing of location-based information has become a way of remembering spatial engagements as well as their significance.

Past studies also found that location-based services are employed by some users as a way of extending themselves spatially and temporally, through the meanings attached to the place or location that they have committed to digital memory through location-based interactions (Frith, 2014). There is also additional significant in the way in which location-based information records the past, and this comes from the digital manner of the service. This digital way of doing things adds a different character to the way that users conceptualize and approach their spatial pasts and locational memories. The availability of a digital tool for creating a memory bank of movement and location is something that can prompt, entice and motivate users to engage with applications.

Firstly, it is evident that timing makes up an important part of the social context in information sharing through the consideration of appropriateness. In traditional organizational studies, the right timing of sharing could facilitate effectiveness among collaborators. Contrarily, the random choice of timing in sharing will cause misunderstandings and chaos in the flow of information. Also, this phenomenon is not rare in personal information sharing context. Several past studies claimed that the conflicts caused by sharing are emerging in recent social media platforms and applications, because users nowadays need to deal with complicated relationships in the meantime during the sharing. The expansion of social media platforms has dominated individuals' virtual life, and united all types of social ties within one place. Hence, the appropriateness associated with timing will be more serious when faced with multiple parties in social media (Liu *et al.*, 2019b). The timing here could be represented by the day in the week, the time in the day, or the date with special meanings for individuals. And along with the location-based information, For example, the sharing of entertainment locations on weekdays is normally identified as inappropriateness for full-time employees, the timing here thus will cause higher concerns for the sharing because the sender definitely does not want to be revealed by colleagues. Due to the variety of roles that individual plays on social media, the conflicts also appear between the supposed timing for appropriated activities associated with these roles. Users are also familiar with strategies in utilizing this tool actively to obtain benefits from social ties, such as sharing the office late night deliberately to leave a positive impression on managers.

Besides, the combination of timing and location-based information could generate fixed expressions when shared to others. Some location-based information could only make sense when shared at specific timing, and the match between location and timing could express more meaning than the content itself. Cramer *et al.* (2011) noticed that when individuals' share bars after dinner time on Foursquare, they are implicitly broadcast an invitation to their friends to join freely if they are nearby. However, if the timing was postponed to late night, then the meaning of sharing bars will be changed to 'we had a good time here' to others. Therefore, the strategic use of timing in sharing the same content could deliver completely different meanings online.

To sum up, the time plays an important role in manipulating individual's perceptions toward locations. Firstly, the archive of location-based information could provide users a record that travels through time, which may keep individuals in mind of this value during the sharing. In addition, the timing of the sharing also alters the meaning and appropriateness of location-based information sharing, which may need a further investigation on its combination with specific locations.

Moreover, it is now widely accepted that people use social media to present a highly curated version of themselves (Schwartz and Halegoua, 2015), enabling the possibility for more controlled and more imaginative performances of identity online (Papacharissi, 2011). This idea of personal identity being a highly curated process, involving some degree of choice, suggests something important about the relationship between social media and identity itself that warrants further attention. The proposition that identity is something people actively work on has its roots in late modernity, when the ontological anchor restraining the concept of identity began to loosen. As Gauntlett (2008) explains, when tradition and habit dominates, individual actions do not have to be analysed so much, because choices are already prescribed by the tradition and customs. Oppositely, in post-traditional societies, identity is more mobile, multiple, personal, self-reflective, and subject to change and innovation (Gauntlett, 2008).

Lifestyle choices give personal narrative an identifiable shape, linking people to communities of people who are same as us – or people who, at least, have made similar choices (Gauntlett, 2008). In the location-based information contexts,

users are aware that their check-ins are grounded on the possibility to be displayed to certain audience, and these imagined spectators might read their movements as well as the activities that may happen in these locations. This sense of revealing is strongly connected to a particular lifestyle (Giddens, 1991), which is much preferred to be associated with healthy and fit impressions. This position is further cemented by the example that people will prefer to check-in to the gym but ignore the check-in to McDonalds.

Again, this underlines the reflective nature of location-based information in relation to identity. Just as location-based information increasingly provides the context from which information is interpreted and used (Gordon and e Silva, 2011). At the same time, the sharing of one's location become a practical means of constructing the kind of person he/she wants to be perceived as. On the contrast, this concept can also be observed in behaviours like avoiding checking-in at places such as clubs and cinemas, with an implicit reason that being afraid of others' negative feedbacks.

In this instance, people will hope their check-ins to be witnessed by others while they are visiting places. This observation provides another thought-provoking position on the affective character of the self as configured through location-based information sharing (Schwartz and Halegoua, 2015). Specifically, most location-based information sharing is performed with two apparent motives (Frith, 2014). Firstly, they are markers of users' past movements. Secondly, these information offer a second and outward viewpoint on the identity that users want to project (Frith, 2014).

The use of location-based information on social media is evidently different to the old versions of location-based services like Dodgeball, which predominately functioned to facilitate social interactions (Humphreys, 2007, 2010). In the series of previous examples, locative service is in part employed to perpetuate a certain sense of self-rooted in the various connotations associated with particular environments. As a result, users spend more time thinking about the spaces they inhabit, what these places might say about them and the different audiences they present their location to through sharing location-based information (Papangelis *et al.*, 2020). Users adopt suitable strategies to deal with the multiple audiences they might face, including the decision not to check-in to certain places, or to

avoid these places all together (Evans and Saker, 2017). And lastly, owing to the knowledge that their shared information might be witnessed by potential audiences, users are able to strengthen their projected self-presentation through the vicarious subject positions these digital footprints of location make on other people.

Regarding the notion of spatial self which is proposed by Schwartz and Halegoua (2015), the use of local search suggests a different relationship between identity and place as well as a different relationship between the front- and back-stage within individuals (Saker, 2017). For example, people like to share places like gyms because these behaviours toward locations were explicitly motivated by a desire to perform the kind of person users wanted to be seen. In performing this kind of practice, users are able to present themselves in this fashion and are also able to have this identity affirmed through the imagined audience that might witness any one of his accumulative enactments (Saker, 2017). This process then has a marked effect on the transformation from the front stage to the back stage, also matches with what Goffman (1959) suggested as keeping closed to members of the audience. For some users, the witnessing by others of their movements enables them to distance gradually from the performative side of their identities (Wang and Stefanone, 2013). Consequently, the performed identity users maintain through location-based information becomes a performance and instead becomes the expected identity.

In summary, by discussing around the concept of identity as a lens through which to consider the various uses of location-based information, the two aspects can be identified from past studies. First, the spatial self is not always as spatial as people normally believe (Farman, 2020). The sharing of location-based information on social media is not simply something that had happened without reasons, but was rather part and parcel of a much bigger narrative that they had been developing over a period. This narrative revolved around a particular lifestyle, which as Giddens (1991) points out is an important indicator of a person's identity. The location-based information was widely used among daily choices, with users' affirmed inclination for locations enabling their identities to be effectively continued. In addition to this, these users also strongly believed that their friends perceived them in a manner depending on the sharing

content, and thus they felt in some ways obligated to engage with the established style in sharing.

2.5 Conclusion

This chapter has reviewed the background and studies related to the location-based information sharing. Firstly, a broad introduction and background of location-based information is presented, and then the core theories and models used in this thesis, including the place attachment theory, the dual-process models, and existing factors and frameworks that fit the research scope in past studies are also reviewed. It then introduced past explorations on what context consists of are to provide a general starting point for contexts in later discussions.

This chapter is of great significance as it provides an up-to-date understanding of the literatures and current research in the domains of location-based information sharing and provides insights on directions to answer the research questions of this thesis. In summary, this chapter can help researchers and practitioners to obtain a systematic view of this particular field.

Chapter 3 Research Framework and Hypotheses Development

3.1 Place Attachments from a Dual-process Perspective

Due to the importance of both place attachment theory and dual-process models in explaining individuals' attitude, decision, and behaviour in multiple domains, there is plenty of research focusing on the their antecedents, constructs, and outcomes (Evans, 2018; De Neys and Pennycook, 2019). Especially, in the area of location-based information sharing, several representative factors and models can be firmly identified.

Firstly, the amount of literature about the interaction of place attachment and information sharing is limited. Stals (2012) provided a theoretical background on place attachment concepts to explain how technology affects city experience. His study also mentioned the use of location-based information and context-aware applications could both enhance the user experience and motivates the sharing of corresponding information. The studies of Farrelly (2013) and Adams (1998) were also examples to present the relationships between technology and place attachment. Farrelly (2013) investigated how people interact with location-based information with place attachment, the effect of mobile-mediated information on place attachment, and the potential of enhancing place attachment by making use of location-based services. Ozkul (2013) stated that location-based information such as check-ins indicate social attachment to places and contains meaning about a place. The study considered check-ins as a mean of communication between people and investigated how check-ins contribute to the feeling of closeness and preservation of social connections.

Moreover, recent studies in information systems also started to keep an eye on this emerging concept. For instance, Cheng *et al.* (2011) proposed a framework to investigate the drivers of users in checking in to places on social media. The study emphasized the function of place attachment in leading to final sharing behaviours, and the strength of this connection is determined by the involvement of individuals when perform the check-in action. Yet another study done by Goel *et al.* (2011) found that the relationship with places in virtual world could also

stimulate the place attachment of individuals, and lead to a strong intention to return to virtual worlds. This means that place attachment could be generated to solely virtual objects, and the physical dimension of place attachment may not need the related information to be really physical.

Compared with place attachment, the dual-process models are way more popular in past studies about the attitude formation and biased intentions (Evans, 2018; De Neys and Pennycook, 2019). Still, its applications in behaviour-level studies are still scarce, especially in the domain of information sharing and related outcomes. Specifically, the reflective intuitive model (RIM) that developed by Strack and Deutsch (2004) is a good example in explaining the social behaviour through dual processing routes (i.e., impulsive vs. reflective). The biggest difference that behaviour-level dual-process models have when compared to attitude-level ones is the ways how information processing generate corresponding behaviours. For instance, in RIM, the reflective system is made up of propositional operations, which is made up of a clear recognition of stimuli and thoughtful and planned behaviour responses. Thus, the reflective link between stimulus and response can be understood as reasoned action (Ajzen and Fishbein, 1973). In contrast, the impulsive link between perception and behaviour is associative in nature and does not require any reasoning. Associative links may be genetically pre-determined or formed by frequent and recent co-occurrence (Olson *et al.*, 2009). Thus, concepts, procedures, and habits may be elicited by contextual cues, and motivational and emotional preconditioning may facilitate or inhibit specific responses (Wood and Neal, 2007). The links are stored in associative memory, assumed to be part of the impulsive system. These distinctions in behaviour-level dual processes clearly change the effectiveness and validity of factors that are proved in past information sharing studies.

Then, to the best of the author's knowledge, although there is a missing in studies that combines both place attachment theory and dual-process models in information sharing studies, the mechanisms proposed in both theories seems exist a match between each other. Firstly, as dual-process models propose that reflective system involves the evaluation of stimuli and following planned behaviours (Strack and Deutsch, 2006), it perfectly matches with the origin of

place dependence. As place dependence concerns with the evaluative benefits along with the location-based activities, it surely includes expectations of intended behaviours, sometimes even contains well prepared sequential behaviours to achieve the goals (Wang and Stefanone, 2013). This evaluative nature of the generation of place dependence presents a congruency with the propositional mechanism in the reflective system in dual-process models, it thus should constitute one route in the discussion of location-based information sharing behaviour.

Besides, for the impulsive system in dual-process models, it postulates that the behaviour of individuals are naturally associated with pre-learned or established behaviour schema that stimulated by information cues (Strack and Deutsch, 2006). Since place identity is recognized as a representation of past interactions with particular places, including memories, repeated visiting, personal appreciations, etc., it also contains corresponding patterns that derived from these factors (Papangelis *et al.*, 2020). Besides, place identity is claimed to describe the phenomenon that place becomes part of individuals themselves (Saker, 2017), then its formation must require a learned schema along with the construction of self-identity. In this sense, the place dependence perfectly fit into the impulsive system in dual-process models, as identity is confirmed in driving individuals' behaviour in a unconscious way (Carter, 2013).

Additionally, on account of the fact that the combination of place attachment and dual-process models have altered the way in discussing the influential factors in past studies, the established findings and results therefore need to be reconsidered within this new framework in their applicability and validity. Specifically, in order to dig deeply into the motivations that drive people to share various types of information, numerous past studies were devoted into this area to explore the motivations (Malik *et al.*, 2016; Rode, 2016; Kim and Fesenmaier, 2017; Hur *et al.*, 2017). The established knowledge spectrum which based on past research is constituted with several streams of topics, including the focuses on social factors, psychological considerations, and contextualized situations, etc. (Angus and Thelwall, 2010; Daugherty *et al.*, 2008; Kyle *et al.*, 2004; Rode, 2016; Waters and Ackerman, 2011)

3.2 Place-related Factors and Place Attachments

Based on the factors reviewed related to the location-based information sharing in the previous section, numerous perspectives and theories have been involved in explaining the individual's behaviour in past studies (Rode, 2016; Kang and Namkung, 2016; Kim, 2016; Kim and Fesenmaier, 2017). Moreover, according to distinctions in terms of how factors are derived from locations and the ways they influence the location-based information sharing (Harrison and Dourish, 1996; Gustafson, 2001; Kyle *et al.*, 2004; Morgan, 2010), these factors are further grouped into two sets, which was labelled as place perceptions and place appraisals, respectively.

Firstly, from the perspective on formations of these factors, it can be easily observed that some of them are proposed based on the anticipated benefits obtained through the location-based information sharing (Sun *et al.*, 2015; Scannell and Gifford, 2017a); while others are derived from the perceived bonding with the location (Gustafson, 2001; Williams and Vaske, 2003; Turton, 2016), such as personal-location identification and proximity. This distinction in the originality of related factors not only reflects the different sources of motivations, but it also indicates separated mechanisms in the way of how they manipulate the individual's behaviour. Past studies claim that, rather than viewing sense of place as exclusively a social construction or representation, it could be seen as a property of the relationship between direct perception process and social construction processes both within and across place-based experiences (Raymond *et al.*, 2017). Along these lines, a distinction could be established between immediately perceived place meanings and socially constructed meanings through longer-term processes of cognition, and effects of both sets of factors on place attachments should be examined, both independently and collectively(Raymond *et al.*, 2010).

Specifically, the factors in place perceptions proposed in this thesis mainly focus on the perceived place features of specific locations, including the social bonding, self-esteem, continuity, and belonginess of the place (Proshansky *et al.*, 1983; Lalli, 1992; Schwartz and Halegoua, 2015; Saker, 2017). These constructs are all related to the psychological cognition of meaningfulness and connections between individuals and locations, and the influences of these factors are

normally already effective long before the actual sharing (Nasar and Julian, 1995; Scannell and Gifford, 2017a). Correspondingly, factors in place appraisals are proposed to capture the expected returns and benefits for the sharing of location-based information, and the variables used in this study are reputation gain, relationship benefit, reciprocal benefit, and emotional benefit (Rode, 2016; Kim, 2016; Kim and Fesenmaier, 2017; Wisniewski *et al.*, 2020). Clearly, these factors are more straightforward in their effects, because they directly measure the tangible and intangible benefits that the sharing behaviour could generate (Sun *et al.*, 2015).

Also, the difference in information processing for these two sets of place features creates a separation on their relationships with the two dimensions of place attachment. First of all, an obvious relationship could be established between place appraisals and place dependence, due to the shared evaluative nature of both constructs (Scannell and Gifford, 2010; Dhar and Gorlin, 2013). Scannell and Gifford (2010) proposed that place dependence highlights the features that provides amenities or resources to support one's goals. And depending on the particular goals sought, the cognitions consist of expectations of goal attainment based on past experiences with focuses on both social or physical aspects could lead to the place dependence (Kyle *et al.*, 2004). Thus, the place appraisals are proposed as predictors of the place dependence in this thesis.

Next, for the place identity, Gross and Brown (2006) stated that it embraces both symbolic and affective elements in the place features. Manzo and Devine-Wright (2013) claimed that the source of place identity consists of factors such as self-esteem, belongingness, and continuity. In behaviour studies related to locations, Breakwell (2015) argued that identity is a dynamic, social product of the interaction of capacities for memory, recognitions and organized construal, which are guided by four principles, i.e., distinctiveness, continuity, self-esteem and self-efficacy.

Moreover, recent studies about place attachment and location-based information sharing with mobility have proposed that the social connection and bonding are essential in constructing identity on social media (Wang *et al.*, 2019; Papangelis *et al.*, 2020). Therefore, it is necessary to include this influence in the consideration of the construction of place identity. Moreover, these connections

with specific locations reveal the self-construal nature of place perceptions (Gu and Ryan, 2008; Evans and Saker, 2017), they are thus proposed as main drivers of place identity in this thesis.

Lastly, although the effects of these factors have been examined separately in past studies, their relationships with the location-based information sharing behaviour have been rarely investigated in a unified research framework (Kang and Namkung, 2016; Kim and Fesenmaier, 2017; Wisniewski *et al.*, 2020). Besides, past research also usually ignored the importance of place-related constructs, especially the mediation effect between the place-related information processing and the sharing behaviour (Li and Chen, 2010; Tsai *et al.*, 2010; Cramer *et al.*, 2011; Beldad and Kusumadewi, 2015).

Thus, this study tries to fill this gap by testing the relationships between the place-related information processing and the location-based information sharing behaviour, with a mediation effect by the place attachment dimensions. And the specific hypotheses development for these constructs will be presented as below.

3.3 Hypotheses Development

The research framework is developed by drawing upon the reviewed place attachment theory and dual-process framework in the previous section to explain the effect of place-related features on individuals' sharing behaviour of location-based information as in Figure 3.1. Specifically, it examines how different types of place-related attributes influences the individual's perception from a dual process perspective, and further, influence the final location-based information sharing behaviour. Following the past literature on mechanisms of location-based information sharing, this study argues that the place identity and place dependence are two key constructs when individual decide whether to share location-based information on social media. Besides, incorporating other related literature on motivations and influencing factors that are proven to be significant in driving people to share location-based information, the proposed model builds and validate their relationships within the two parallel systems in a dual-process model. Below, the hypotheses are described in more detail.

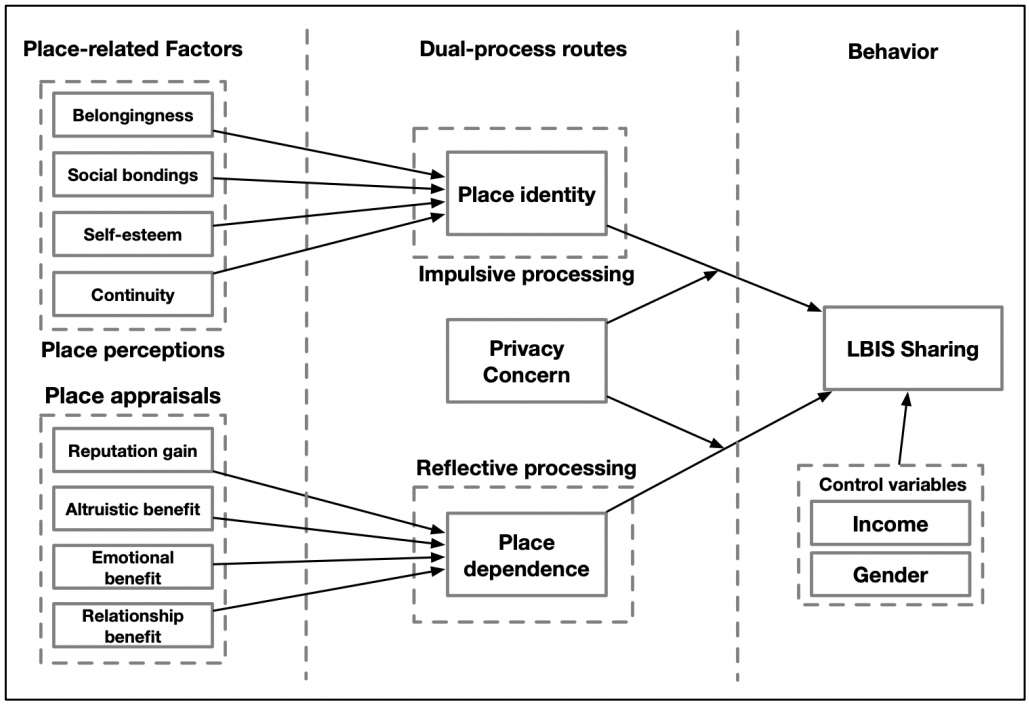

Figure 3.1 Research Framework Constructed with Place Attachment Theory from a Dual-process Perspective

3.3.1 Location-based Information Sharing Behaviours

Location-based information sharing, as a subset of information sharing behaviours that focuses on location-related content, possesses a hybrid sharing nature of both general and location-aware information (Cramer *et al.*, 2011; Beldad and Kusumadewi, 2015; Kim, 2016). Through corresponding impulsive and reflective system in the dual-process model, the two dimensions in place attachment theory, place identity and place dependence, are proposed to influence the individual's location-based information sharing behaviour.

Firstly, for the place identity, it is defined as the degree of the place in reflecting the individual identity to others (Jorgensen and Stedman, 2006). So, in another word, individuals will have higher sense of place identity when they believe they are represented by some characteristics of the certain places (Knez, 2005). Examples can be found in places like the landmark of hometown, the university that individual has studied, and the restaurant or store that individual favours. Past studies have systematically investigated the effectiveness of place identity in driving individual's behaviours in re-inhabitation (Hernández *et al.*, 2007), tourism (Dwyer *et al.*, 2019), and e-WOM (Kim and Fesenmaier, 2017).

The findings of these research claimed that the perceived identity toward particular places could make people more willing to engage with activities that associated with the place, even the actual outcome of the behaviour disobeys the interest of the individual (Korpela, 1989). One good example is the study done by Gustafson (2001) related to the relocation of inhabitants in disaster-affected areas, in which they found that residents will refuse to move to safer places because of a high level of place identity. Besides, from this pioneering study, other scholars further explored the functioning mechanism of place identity (Schwartz and Halegoua, 2015; Evans and Saker, 2017; Saker, 2017). Given the widely accepted assumption that identity is formed through repetitive interactions and emotional bonding, it usually takes the form of so-called habitation or custom (Twigger-Ross *et al.*, 2003). And such terms are extensively examined and confirmed in past studies about the influences on people's mind and behaviour in an unconscious way (Hogg, 2020; Papangelis *et al.*, 2020). For example, on social media, users show higher preference for the content that are related to their identities, because they could use it as an impression management tool to tell others who and what they are (Salem and Salem, 2018).

Besides, individuals also tend to trust the information that are originated or related to their identities (e.g., people who come from the same city or share similar interests), and the following behaviours like sharing and commenting will also be motivated (Rode, 2016). Moreover, this perception of place identity is not limited to specific locations in where the interaction happens but could also be applied to other places that share transferable characteristics with identity-related signals (Stets and Biga, 2003). Similarly, in location-based information sharing, if people sense the place are identically connected with themselves, they will form a belief that location can be used as another image online. Thus, they will be more interested in sharing the information related to that location. Hence, it is proposed that:

H1. Place identity will positively influence the sharing behaviour of location-based information.

Besides the place identity, another critical aspect in the place attachment theory is place dependence, which was widely used to capture the utility benefits or

expected returns of behaviour related to places (Altman and Low, 2012). Generally speaking, commonly accepted sources of place dependence are found to be highly related to careers, reputations, and impressions (Jorgensen and Stedman, 2006). The formation of place dependence may not be bonded to long-term relationship with the location but could be quickly assembled based on expectations and knowledge obtained from past experience (Jorgensen and Stedman, 2006).

However, the original definition of place dependence normally focuses on the physical affordance of a location in facilitating individuals' activities in career development, natural exploration, and entertainment, etc. (Bonaiuto *et al.*, 1999; Hidalgo and Hernandez, 2001; Kyle *et al.*, 2005) Thus, the place dependence is mostly used to describe a bonding with exclusivity, that is, individuals will not choose to move to another similar place if the they have a high place dependence on the particular location (Di Masso *et al.*, 2019). Nonetheless, the location-based information, which is rooted with the proliferation of mobile technologies, has changed this relationship with increased mobility (Moore, 2011; Moores, 2012). Firstly, the exclusivity was largely mitigated by the extended area of activities, and the preference towards a single location may be modified to multiple needs that could be satisfied by specific locations (Scannell and Gifford, 2017a). Secondly, the spread of mobile devices have also altered the way in the formation of place connections (Moores, 2012). Previously, individuals may only develop a strong bonding with single place that could satisfy most of their needs (Relph, 1976). Whereas, with the help of mobile network, different needs of individuals now could be separately satisfied by various places, and thus lead to multiple sources of place dependence on social media (Di Masso *et al.*, 2019).

In the current social media environment, dominant factors related to place dependence are mostly related to the gaining of respect and reputations (Hidalgo and Hernandez, 2001; Knez, 2005). For example, the most famous phenomenon is that users on social media will refer popular shop or cafe online as the "Instagrammable" places (Apaolaza *et al.*, 2021). The name is originated from the famous photo-sharing platform, Instagram, and the meaning of this word is inspired by the phenomenon that users will be more willing to share those

attractive and stylish places on Instagram than ordinary ones, because it can help them to gain more attentions and reputations (Taylor, 2020).

Unlike place identity, place dependence is normally constructed through rational reasoning from established logic processes (Scannell and Gifford, 2010). Sometimes, the decision of sharing particular location is even determined before individuals' visiting (Frith, 2014). It is quite common for individuals nowadays to notice hot local spots from social media, and it is evident that most sharing in these locations are pre-determined before the departure, aiming for an increase in influences or showing off (Wang and Stefanone, 2013). Hence, as long as the place could provide more advantages than alternative choices, it will promote a higher place dependence for individuals (Dwyer *et al.*, 2019). In the context of location-based information sharing, if user believe the sharing or displaying of specific location is beneficial in satisfying corresponding needs, then there will be a higher chance that they will share it to others. Thus, it is proposed that:

H2. Place dependence will positively influence the sharing behaviour of location-based information.

3.3.2 The Moderation Effects of Privacy Concern on Place Attachment

Besides the two dimensions in place attachment theory that directly influence the user behaviour, privacy is also an inescapable variable in affecting people's haring behaviour online (Knijnenburg *et al.*, 2017; Anaraky *et al.*, 2018; Wang *et al.*, 2019). Although past studies tend to use privacy-related constructs (e.g., privacy concerns and privacy awareness, etc.) as either direct antecedent to the final behaviour (Dinev and Hart, 2006; Krasnova *et al.*, 2012) or indirect antecedent in the systematic processing of dual-process model (Aivazpour *et al.*, 2017). However, the way of privacy in influencing individual's sharing behaviour is still under fierce debate, and the development of dual-process model also provides new perspectives in explaining the effect of privacy.

Generally, privacy concern is an important variables with which users adjust their processing styles and decide whether or not to share information with other (Xu *et al.*, 2011). Privacy concern refers to the degree to which users sense a high potential loss associated with releasing specific information (Dowling and Staelin, 1994). Krasnova *et al.* (2012) find that online users feel concerned about

privacy such as information sharing, recommendations, and their profiles being viewed by third parties (e.g., service providers). In dual-process models, Evans (2018) proposed that two systems that individual normally utilize during decision-making are not mutually exclusive, and key to the balance between systems is the cognitive effort and sense of necessity.

Specifically, past studies in the investigation of information sharing online have found that privacy is one critical variable to affect the decision style (Aivazpour *et al.*, 2017). When individuals are not aware that their privacy may be violated, they generally will not devote much cognitive effort in decision making, especially when they are facing a familiar context (Wattanacharoensil and La-ornual, 2019). On the contrary, if individuals could clearly sense the risk of losing privacy, they will perceive a need to reconsider the situation and then actively engage the systematic thinking in the reasoning process and to justify if they are making the appropriate decision (Wattanacharoensil and La-ornual, 2019).

Especially, users interact with different social circles on the same platform. In such a context, users' messages online can be viewed by their friends from different social circles and context within which will be dominant in driving their final decision (Cheung and Lee, 2010). As various contexts have different untold requirements and custom for the appropriateness of information, users need to handle these differences by adjusting contents and audience of the message (Liu *et al.*, 2019b). As a consequence of this, they may utilize diverse processing systems when corresponding practices are changed by the information to be shared, and this balance between two systems in dual-process model is believed to be manipulated by the privacy concern (Wang *et al.*, 2019). Based on the statement of dual-process models, with the increase of privacy awareness, individuals will rely more on their reflective thinking instead of impulsive.

In the context of location-based information sharing, if individual is familiar with the place to which the information is related and has a high sense of identification with it (i.e., with high place identity), then the sharing decision is normally made automatically (Turton, 2016). And, if the individual aware that there exists a possibility that information may cause privacy issues or

inappropriateness online, then they may additionally engage reflective system into the consideration (Evans, 2018). Since place identity will generally involves more concerns about personal information violation, the increased privacy concern will mitigate the influence of impulsive system, especially considering that the disclosure of location with high place attachment may risk violating role conflicts on social media (Liu *et al.*, 2019b). Correspondingly, the rise of privacy concern will motivate individuals to engage reflective thinking, and force them to evaluate the place dependence rationally (Strack and Deutsch, 2006). In this way, the information processing of location-based information will follow the style proposed in past studies related to calculus models. Hence, it is obvious that individuals with higher privacy concerns will also tend to think carefully about the expected returns on the sharing behaviour (Wang *et al.*, 2019), the influence of place dependence will thus also be mitigated.

Besides, the privacy concern could facilitate the effect of place dependence due to the change from impulsive thinking to reflective thinking (Evans, 2018). In another word, with the increase of privacy concern, individuals would focus more on the benefits associated with the location sharing, thus increase of influence of place dependence on the final sharing behaviour of location-based information (Chen *et al.*, 2014). Strack and Deutsch (2004) proposed that although the two systems in a dual-process model are assumed to operate in parallel, the impulsive system is believed as always engaged, whereas the engagement of the reflective system depends on the activation of related motivational factors. Therefore, as privacy concern increases, the strength of place dependence will be empowered and eventually overrun the influence of place identity and dominate the decision-making process (Wang *et al.*, 2019). Reflected in the relationships between privacy and two systems, the moderation effect of privacy concerns on place dependence should be larger than the one for place identity. Therefore, it is hypothesized that:

H3. Privacy concern will both negatively moderate the influence of a) place identity and b) place dependence on the sharing behaviour of location-based information.

3.3.3 Place Perceptions and Place Identity

For constructs in place perceptions, the social bonding, self-esteem, continuity, and belonginess of the place are believed to be the key items (Turton, 2016; Scannell and Gifford, 2017b; Di Masso *et al.*, 2017; Dwyer *et al.*, 2019; Di Masso *et al.*, 2019). As they are proposed as direct indicators to the place identity, such relationships are discussed in detail as following.

Firstly, for social bonding, several past studies in the environmental psychology literature have noted the importance of social ties linked with places (Altman and Low, 2012). If meaningful social relationships occur and are maintained in specific settings, it is likely that these settings share meanings that based on the relationships and shared experiences. Mesch and Manor (1998) observed that individuals' social investments within their visited places affected their sentiments toward the place, individuals with closer social connections embedded within the place express stronger attachments to that place. Hidalgo and Hernandez (2001) reported similar findings and found that social bonding is stronger than normal settings when make decisions regarding locations.

The social bonding is believed to be a significant driver in the formation of so-called special connection with the place (Ramkissoon and Mavondo, 2015; Scannell and Gifford, 2017b). Under such condition, the social bonding highly relies on the affective and emotional factors attached to the place, and the influence of imagined others involved in the social bonding could also influence individual's behaviour, in a way that the individual will tend to conform to what they believed that others would like (Evans and Saker, 2017; Papangelis *et al.*, 2020). The perceived others during the expression normally takes the name of 'we', 'tradition', and 'status', which all reflect the reference to the identity-representation of the place (Wang, 2013). Thus, these relationships are believed to have a direct and impactful effect in the formation of place identity. Thus, the following hypothesis is proposed:

H4. Social bonding will positively influence the place identity.

Next, another important factors to place identity is the self-esteem derived from the place (Wang and Xu, 2015). Self-esteem refers to a positive evaluation of oneself or the group with which one identifies (Ellemers *et al.*, 1999). With

regard to place identity, Korpela (1989) observed that the favoured environment in a location could boost the self-esteem, and the evaluation of place membership with such settings impacts upon self-esteem (Gu and Ryan, 2008). For instance, Uzzell (1996) found evidence that living in a historic town generates a sense of pride through association. Twigger-Ross *et al.* (2003) stressed that self-esteem differs from simply evaluating a place positively, it encapsulates a special positive bonding with the location, and they suggest that a person could gain a boost in self-esteem from such relationship. Gu and Ryan (2008) further postulated that being a city resident can either be a source of pride if the resident feels the city is highly valued by others, or alternatively a source of dissatisfaction if the city reminds him or her of something negative. These studies all suggest that the self-esteem is not just a feeling that simply be put onto a place, but a bidirectional connection with the place which makes the place a part of the individual's own identity (Wang and Xu, 2015).

Especially, in the context of location-based information sharing, this positive evaluation of the location is shown to increase the place identity (Giddens, 1991; Papangelis *et al.*, 2020). Barcus and Brunn (2010) claimed that the information displayed on emails, televisions, and Internet that related to the hometown could stimulate the self-esteem of individuals, and motivate the behaviour of sharing within the friend circle who comes from the same place. Such behaviour indicates a strong inference that the sharing of location-based information within certain circle is motivated by the shared identity constructed through locations. Besides, the self-esteem was also claimed to significantly encourage individuals' behaviour related to religious locations (Ysseldyk *et al.*, 2016). Moreover, the self-esteem enhanced by such places will positively influence the related moods and behaviours (Ysseldyk *et al.*, 2016). Thus, the self-esteem is widely used in past studies to predict the place identity and following behaviours. Based on these discussions, the following hypothesis is proposed:

H5. Self-esteem will positively influence the place identity.

As one of the important items in the construction of identity, the continuity has also long been used as a strong indicator of place identity (Gustafson, 2001; Giuliani, 2003; Kyle *et al.*, 2005). As defined as the desire to preserve temporal coherence of the self-concept, this factors focuses on the maintenance and

development of self-construal over time (Lalli, 1992). Since the consistent visiting and regular records transform places as a platform which facilitates activities and social interactions, this means that to secure identity is to ensure continuity in the physical, social together with meanings and attachment held by the people (Ujang and Zakariya, 2015). Based on this principle, it is suggested that a place will be preferred by people who are more attached in ways to maintain the continuity of self-construal (Ujang, 2012). The self needs are believed in a state of flux, but equally, too much change or stability can be psychologically harmful (Gu and Ryan, 2008). This statement is supported by the assumption proposed in Gustafson (2001), which claimed that location can be used as both a base for safety seeking and further exploration. These two functions simultaneously stress that location is the essence of individuals' social and physical activities, and could be seen as anchors of every step that has been made by individuals (Di Masso *et al.*, 2019).

For the location-based information, similar findings are also identified from past studies. Especially, as location-based information as important means in impression management on social media, the ability in displaying self-related information thus is salient for users (Cramer *et al.*, 2011). To start with, location-based information that marks individuals' past movements is valuable in echoing their self-identities, in a style of strategically selecting the ones representing their preferred identity (Wang and Xu, 2015). Furthermore, each location-based information exposed on social media is the new form of anchor that displayed to others. Particularly, the disclosure of these location-based information makes up a narrative about individuals, and the continuity in keep this story going on also forms a non-substitutable part of place identity (Tally Jr, 2018).

Therefore, to preserve a high-level of continuity upon places could make it a more meaningful piece for individuals, and then promote the sense of place identity when interact with the related message. Therefore, the following hypotheses are proposed:

H6. Continuity will positively influence the place identity.

In addition, the last item in place perceptions is the belongingness of the place (Hochschild Jr, 2010; Di Masso *et al.*, 2017). Originally, the belongingness, or the sense of belonging, refers to a sense of emotional involvement with the group (Di Masso *et al.*, 2017). When people identify themselves as part of the community and align their goals with those of the community, they will treat other members as their kin, and they will be willing to do something beneficial to/for others that are not necessarily beneficial (Raymond *et al.*, 2010). Lakhani and Von Hippel (2004) also argued that individuals take part in knowledge sharing since they think such behaviour is best for the community.

Hence, people with this variant of intrinsic motivation will be motivated to participate in sharing activities and help the community. Furthermore, in the context of past tourism and environmental psychology studies, this type of belongingness could also be attached to places (Ramkissoon and Mavondo, 2015; Di Masso *et al.*, 2017; Di Masso *et al.*, 2019). People often acquire a sense of belonging and purpose via personal attachments with a physical location (Relph, 1976), which in turn may give meaning to their lives. It is one's sense of place or rootedness that gives one a sense of belonging (Lewicka, 2013). Based on findings in past literature, it is found that identity of place is not only restricted to its physical characteristics (Proshansky *et al.*, 1983), it is also related to the social constructions of place – those perceptions formed by individuals and groups (Lalli, 1992). As Lalli (1992) states, it is not only the identity of the place itself, but also a person's relationship with place and how they identify with place, that gives meaning to place.

In the domain of location-based information, the belongingness could be attached to communities represented by locations that formed through common interests, hobbies, and professions (Hammitt *et al.*, 2006; Cheng and Kuo, 2015). A strong sense of place belonging could make individuals voluntarily contribute efforts to communities' knowledge , and successfully predicts psychological satisfaction of people (Hammitt *et al.*, 2006). In this regard, the feeling of nostalgia and psychological ownership are also involved in the belongingness of places, and such feelings demonstrate pieces of individual's essence in confirming self-identities (Yavuz and Toker, 2014). Thus, the continuity in location-based information could remind individuals of their memories and

activities, which will increase their feeling in place identity, and the following hypothesis is proposed:

H7. Belongingness will positively influence the place identity.

3.3.4 Place Appraisals and Place Dependence

As for factors in place appraisals, the reputation gain, emotional benefit, relationship benefit, and altruistic benefit are all related to expected tangible or intangible returns for the sharing of location-based information (Rode, 2016; Kang and Namkung, 2016; Kim, 2016; Wisniewski *et al.*, 2020; Taylor, 2020). Since these factors are main benefits that individuals will consider upon the advantages of specific locations, it is proposed closely related to the place dependence, such relationships are discussed in detail as following.

Firstly, for the reputation gain, it is referred as the expected positive social status and evaluations that could be obtained from others through specific behaviours (George *et al.*, 2016). And as one of the most well-known items in anticipated benefits, the reputation gain has been widely adopted in existing information sharing studies (Emelo, 2012; Ensign and Hebert, 2010; George *et al.*, 2016; Havakhor *et al.*, 2018). For example, reputation is often cited as an important determinant of e-WOM behaviour (Cheung and Lee, 2012), and people would like to share and contribute their knowledge to community because they want to gain an informal recognition and establish themselves as experts (Movshovitz-Attias *et al.*, 2013).

Besides, within the organization, the reputation gain is also a strong predictor in in information sharing among colleagues (Ensign and Hebert, 2010). Ensign and Hebert (2010) argued that individuals will choose to share the controlled information to gain others' respects and make further collaboration easier with this increased reputation. Through an extension to social media environment, the reputation gain was also considered as a strong motivation in information diffusion (Havakhor *et al.*, 2018), but follows a more social-oriented style. Movshovitz-Attias *et al.* (2013)found that the reputation system is effective in promoting users' activeness and answer qualities on the Q&A platform. Havakhor *et al.* (2018) also stated that the information with high value in reputation boost and expertise presentation will be extremely preferred in the

secondary sharing and recommendation, with an aim in attracting followers, replies, and likes.

Likewise, in the situation of location-based information sharing, the location with high possibility in reputation gain usually takes the form as 'instagrammable' places, which means hot and popular locative information on social media (Anderson, 2017). The sharing of such information has become a trend in recent social environments, individuals choose to follow this trend so that they can increase the exposure and influence of themselves (Havakhor *et al.*, 2018). Furthermore, the location-based information on social media plays a role in organizing users into different interest groups (Kyle *et al.*, 2004). In a similar way in presenting expertise on Q&A platforms, the sharing of related location-based information with specific interest group could also increase the status of individuals on social media, and may further develop them as key opinion leaders of certain area (Havakhor *et al.*, 2018). Therefore, the location-based information with high expected reputation gain will lead to a rise in place identity, and the following hypothesis is proposed:

H8. Reputation gain will positively influence the place dependence.

Next, besides the expected reputation gain, another kind of anticipated benefits is the relationship benefit. According to the use and gratification theory (Lee and Ma, 2012), individuals interact with each other to find new friends who share similar interests and to maintain existing relationships (Rubin, 2009). Specifically, past studies on online communications have elaborated the social gratifications derived from using the communication tools, and enjoyment of forging social ties claimed to be an indispensable part (Quan-Haase and Young, 2010). Papacharissi and Rubin (2000) further found that individuals use information as an alternative tool in interpersonal communication and several scholars have uncovered possible relationships between the relationship needs and information sharing.

For instance, Lee and Ma (2012) found that relationship benefits was positively related to information sharing of online news services, because the argument provided in news content is helpful in finding peers with similar opinions. In terms of social media, Han *et al.* (2015) noted that meeting new friends was

regarded as one of the gratifications that motivates college students to participate in Facebook groups. In line with this finding, Dunne *et al.* (2010) concluded that maintaining relationships was a key driver for using social networking sites. Taken together, it is argued that social media offers advantages in the development and maintenance of relationships, and information sharing in social media becomes a method in achieving this goal.

Similarly, in the context of location-based information sharing, the anticipation in relationship maintenance and extension through places could also be achieved by location-aware services and information (Schiller and Voisard, 2004; Ozkul, 2013; Beldad and Kusumadewi, 2015). Location-based services like recommending people and services nearby have been highly valued by social media in their effectiveness for relationship building (Zhu *et al.*, 2010). Although the validity of location in facilitating relationship benefits is confirmed through these applications, the active sharing of location-based information follows different paths in driving individuals' behaviour (Zhao *et al.*, 2012).

The first reason is that as location may bear memories of past activities and experiences formed with other individuals, and the sharing of such information could lead to a high expectation to strengthen or re-connect the bonds with involved others (Saker and Evans, 2016). This behaviour has been largely used to indicate good relationships and provides opportunities for friends to communicate (Frith and Kalin, 2016). Consequently, it could maintain and reinforce the existing relationships of the individual (Kyle *et al.*, 2004). Additionally, the functionality of places in providing social affordance is also an important purpose in location-based information sharing (Gay, 2009). Such needs are also noticed by most location-based information service platforms, and functions like nearby spots, point of interests, and recommendation systems have been developed to provide social systems for users to build new connections with others (Wang *et al.*, 2014). The common interests and highly valued elements associated with place make it a social platform that allows individuals to communicate and meet new friends (Cramer *et al.*, 2011).

Therefore, the sharing of places could increase the individual's possibility in meeting new friends and extending the social circle. Clearly, these two main

functionalities of location-based information could contribute a lot to the place dependence, and the following hypothesis is proposed:

H9. Relationship benefit will positively influence the place dependence.

Next, for the emotional benefits, past studies tend to use the term entertainment to refer this anticipated reward as the way information and technology serve as a means for amusement and escaping pressure (Patil *et al.*, 2012). Specifically, the value of entertainment is attributed to the ability to satisfy individuals' needs for escapism, enjoyment, emotional release, and anxiety relief (McQuail, 2005).

In particular, Nov *et al.* (2010) proposed emotional benefit as an intrinsic motivation to encourage users to share photos within an online community. Research on content sharing on mobile applications also suggest that contributing content on such platforms provide a good source of emotional lift (Lee and Ma, 2012). With regard to news consumption, research has also shown that emotion is positively related to individuals' social media message reading but not with newspaper reading (Diddi and LaRose, 2006). A possible explanation is that the social media not only satisfies basic information needs but also provides enjoyment through interactions with others such as discussions and gossip (Diddi and LaRose, 2006). These would help users find release from stress in their daily life and improve the functionality of information through providing emotional support.

Unsurprisingly, similar findings on emotional benefits are also found salient in relation of location-based information (Patil *et al.*, 2012). Firstly, some typical places are believe to linked with special meanings for individuals, and the association with such places could help people to calm nerves and search for emotional involvement (Schwartz, 2014). (Cristoforetti *et al.*, 2011) proposed that the home of people represents a 'comfortable' place, a concept that combines both physical and emotional comfort derived from familiarity, personal rituals and routines, and other characteristics. Thus, this emotional connections with home, and sometimes hometown, will increase the dependence of individuals toward it. Similarly, Oleksy and Wnuk (2017) found that frequent playing on fixed virtual places could elicit a emotional attachment between

players and locations, and it further stimulate following activities around these places as a form of dependence.

In summary, the emotional benefit that associated with specific places are proved to successfully increase the dependence of individuals, through the function of mood calm and emotional support. Thus, the following hypothesis is proposed:

H10. Emotional benefit will positively influence the place dependence.

Lastly, for the altruistic benefit, it reflects another kind of expected outcome that involves the consideration about others (Ha *et al.*, 2017). Altruism, or altruistic motivation, explains individuals' tendency to consider the welfare of others without consciously considering the personal benefits. Furthermore, altruistic benefit refers to the welfare of others without conscious regard for one's own interest, and without expectation of a personal return (Davenport and Prusak, 1998).

For the application of this factor, many domains have attached great importance to this community-based motivation in explaining individuals' behaviours (Ma and Chan, 2014; Shahzalal and Font, 2018). Ma and Chan (2014) proposed that this consideration about others is important for knowledge sharing, particularly in social media environments, where communities are formed based on common interests. They also suggested that users with high altruistic motivations are more likely to help others intentionally, and seek a sense of satisfaction from the action (Kollock, 1999). Moreover, the resources of altruistic benefit is rather complicated than other kinds of rewards (Munar and Jacobsen, 2014). It is claimed that individuals are willing to contribute to communities because they enjoy helping others (He and Wei, 2009) or feel a mental obligation to repay the helps they received earlier in the same community (Parra-López *et al.*, 2011). In this case, past studies in marketing and e-WOM claimed that altruistic benefit could be achieved when consumers want to help others by providing both positive and negative consumption experiences for making purchase decisions (Say *et al.*, 2021). In addition, another source of altruistic benefit is given through the satisfaction of consumers with their purchase experience, which will further encourage a good will from customers to the company to hope it becomes

or remains successful (Sundaram *et al.*, 1998). Consequently, this willing to increase the influence of brand or company will drive individuals to share related information as a return of favour.

Beside, in the case of location-based information, altruism is also a major incentive for sharing information through online social media (Munar and Jacobsen, 2014). For example, in tourist information sharing, travellers may be motivated by the benefit in helping others through providing destination-related reviews and contribute to the well-being of other travellers through enriched knowledge on tourist experiences (Gretzel and Yoo, 2008). And also, as location information can be used to organize communities based on shared experiences and memories, it would create a positive impression for the locations that individuals identity themselves with (Zhang *et al.*, 2018). Accordingly, similar to the situation in e-WOM, this positive evaluation of the location will also motivate individuals to share it to display positive images of the community (Mak, 2017). By associating self with location, altruistic benefits could be achieved for the community represented by the location through showing personal supports and increasing collective impressions in sharing location-based information.

These two kinds of altruistic benefits are believed to increase the individual's dependence on the location-based information, and the following hypothesis is proposed:

H11. Altruistic benefit will positively influence the place dependence.

3.3.5 Income and Gender as Control Variables

Lastly, past studies have also mentioned that the income and gender are two other important factors that could directly influence the individual's behaviour towards location-based information. Firstly, for the income, it is claimed that with different level of incomes, individuals' perception towards specific location will also be modified accordingly (Zhang *et al.*, 2018). Specifically, the income will influence the sense of specialness of a particular place (Droseltis and Vignoles, 2010), and also the confidence and expected outcome in a sharing activity (Paridon *et al.*, 2006). Therefore, it is important to control the variance

of income to contain its effects on individual's sharing behavior of location-based information.

Next, the gender is another commonly considered factor in past information sharing literature. Past studies have found that for individuals with different genders, their tendencies in knowledge sharing, communication, and word-of-mouth behaviors show a clear distinction between two parties (Lin and Wang, 2020). And as a particular context within the broad topic of information sharing, the location-based information sharing will also be potentially influenced by this effect. Hence, gender should also be included in this study as another control variable to provide a robust check on proposed hypotheses.

3.4 Conclusion

Based on the existing literature and past findings on location-based information studies, this chapter proposes a research framework to investigate the effects of place-related features and constructs on the sharing behaviour. Firstly, by reviewing the mechanism proposed for both dual-process models and place attachment theory, a match between two processing systems and two attachment dimensions is established. As place identity is constructed through memories, experiences, and activities, it is believed to influence the sharing behaviour through the established behavioural patterns based on this identity. Besides, the place dependence on social media is composed of expected benefits that are consciously evaluated by individuals, and the assessment of these benefits will require careful and serious considerations to obtain a result. Thus, through these two different ways in influencing behaviour, two place attachment dimensions matches with the impulsive and reflective system, respectively.

Secondly, based on the originality and influencing mechanism, place features are grouped into two types, according to the two place attachment dimensions. The first type is based on the personal identifications with the location, and it is proposed to link with the place identity in the way of how the information could be used as a personal extension on social media. In addition, another type is associated with the expected returns and rewards that could be achieved through the location-based information sharing. Since these factors could increase the

utility of information on social media environment, they are proposed to link with the place dependence.

Lastly, a research framework is proposed with the mediation effect of place attachment theory and moderation effect of privacy concerns. Detailed discussions and hypotheses are proposed to support the relationships in the research framework. Thus, this chapter provides a foundation for further investigations on effects of factors on location-based information sharing and boundary conditions of these relationships under various contexts.

Chapter 4 Methodology

Since the research questions proposed in this thesis are to investigate the effect of contexts in location-based information sharing, it is necessary to understand the meaning and structure of contexts, and then to examine the procedure of how this influence affects individuals' behaviour. Then, due to the divergent nature of these two tasks, different research methods should be adopted, accordingly.

4.1 Purpose of the Mixed-method Approach

The focus of the thesis is the influence of contexts in location-based information sharing, which involves affective, experiential, spontaneous, and intuitive aspects (Smallman and Moore, 2010). In order to capture this dynamic in the relationship between individual's location-related cognitions and behaviours, post-positivism could be served as a broad and pragmatic means to examine the contextual behaviour by linking theory and practice and providing guidance on using multiple techniques for collecting and analysing data (Ryan, 2006). Following the post-positivism paradigm, the pursuit of an overall 'truth' is not the final aim of this thesis, especially due to the complexity of the mobile environment and human experience. Alternatively, for the reason that it is nearly impossible to access all areas of human experience and relationships between person, experience, and knowledge are multiple and relational, the post-positivism paradigm proposes the use of natural settings and situational/contextual data in providing useful information for answering research questions in this thesis (Henderson, 2011). Besides, the post-positivism could also encourage a reflective thinking of studies, which are normally driven by specific theoretical orientations (Henderson, 2011). Consequently, the post-positivism approach can uncover more insights into human decision-making, presenting a more reflective way to improve validity and avoid biases.

In terms of the meaning and structure of contexts in the location-based information, compared to quantitative research, qualitative research can provide an in-depth picture of individuals' behaviour and perception by obtaining real and first-hand information that can capture such complexity (Ryan, 2006). A qualitative research design is thus suitable for this study. Specifically, this study

aims to gain insight into individuals' cognitive processes when making decisions, and the content analysis is adopted to capture the themes and topics covered in this process. It is particularly suitable for this kind of qualitative method in real-time situations with high-time pressure and unfamiliar and complex tasks (Weber, 1990).

Next, for the examination of contextual influences on individuals' decision-making processes in location-based information sharing, past studies mostly used questionnaires to measure related factors and test their impacts on the sharing behaviour (Munar and Jacobsen, 2014; Beldad and Kusumadewi, 2015; Kim, 2016; Kim and Fesenmaier, 2017). Nonetheless, this method was criticized in its validity in explaining the on-site experience and behaviour, which is highly dependent on the situation and context at that time (Zhu *et al.*, 2010). The dual-process models also states that the behaviour driven by impulsive systems is not based on rational thinking, and a posteriori measurement of related factors may be affected by the bias in the recall processes (Singh and Wilkes, 1996). Thus, in order to evaluate the exact perceptions and processes for the contextual decision making, it is vital to add mocked situations in a scenario-based survey to capture the temporal cognitions of individuals. The combination of generated scenarios and follow-up questionnaires may overcome the limitations of other methods, and has been widely used for studying information sharing behaviours. It generally improves internal validity because it allows for tight control of the study environment. This control allows precise predictions derived from a theory or a model to be tested. Schendel and Hofer (1979) provided arguments to support the use of scenario-based survey in social studies: 1) firstly, scenario-based studies are ideal for dealing with questions that cannot be addressed through field research owing to access problems and expense, 2) secondly, the control inherent in scenario-based studies increases the ability to evaluate causal hypotheses. In the same vein, scenario-based research may provide an effective method for testing the dynamic process altered by contexts in the location-based information sharing.

4.2 Connections between Qualitative and Quantitative Study

Hence, this thesis adopts a mixed-method approach to test and substantiate the proposed research model by combining qualitative data from interviews with

quantitative data collected through scenario-based survey. For the data analysis and presentation, the process closely follows the approach suggested by Venkatesh *et al.* (2013) for leveraging the full potential of the mixed methods research. Mixed-method approach has been strongly advised in Information Systems because it allows researchers to gain a more complete understanding of underlined mechanisms about phenomena of interest in the discipline (Venkatesh *et al.*, 2013).

In terms of the structure of mixed-method approaches, some scholars believe that mixed-method research could gently refer to any research investigation that uses more than one method (Mingers, 2003), while other scholars are referring specifically to the combination of qualitative and quantitative research methods (Venkatesh *et al.*, 2013). The research design adopted in this thesis is mixed-method according to the later one. Specifically, this study followed the most common type of mixed-method investigation, a sequential design (Creswell *et al.*, 2011).

Firstly, the interviews with actual users of social media who have shared location-based information will be conducted to explore the themes and processes in the sharing behaviour qualitatively. These interviews were conducted in an open-ended style, and close attentions were paid to the interpretations and sense-making of participants' responses. The aim of this method is to achieve a rich, context-aware exploration of the phenomena of interest - the unpacking of contexts in location-based information and the latent mechanism behind its effect on final sharing decisions. Second, the scenario-based survey is used to test the proposed hypotheses in this thesis quantitatively. In this way, the findings from the qualitative study will be well conceptualized and examined with systematic statistical tests, and such integration of interviews and surveys has been pointed out as one of the most fruitful applications of mixed-method research (Venkatesh *et al.*, 2013).

Moreover, by utilizing the mixed-method approach, the corresponding rigorousness of the research design need to be discussed carefully in terms of both appropriateness and intended aims (Venkatesh *et al.*, 2016). Firstly, the appropriateness of utilizing a mixed-method approach should be primarily justified by the research questions, objectives, and contexts, rather than by the

core purpose of conducting the research enquiry (Venkatesh *et al.*, 2013; Venkatesh *et al.*, 2016). The research questions for this thesis seek to extend existing literature of location-based information by incorporating the unique contextual implications on its sharing on social media. To this end, this study ground the arguments in the dual-process theory, a theory that is extensively explored in IS contexts to investigate user behaviours, and place attachment theory, a theory widely used in past environment psychology and tourism studies, to inspect the boundary conditions and dynamics of factors in location-based information sharing. Hence, a holistic approach is needed to develop both the understanding of contexts and the research framework in explaining the process in decision-making.

In accordance with the research objectives, in which the exploration of related factors in various contexts has been claimed to be the key question in this thesis, semi-structured interviews were firstly conducted with frequent social media users who are familiar with the location-based information sharing. For the influences of contexts on sharing behaviour, which is relatively underexplored in past studies, it is then crucial to confirm the inferences from the qualitative study with following examinations on the findings through testing particular relationships between factors. Specifically, the quantitative study surveyed general users to examine their perceptions toward the scenario-based location-based information and checked their influences on the final sharing behaviour. The follow-up quantitative study thus provides additional complementary insights from the statistical perspective for a coherent understanding of the location-based information sharing behaviour (Kim, 2016).

To summarize, the two primary purposes of the mixed-method approach used in this thesis are the confirmation and complementarity of the findings, and a sequential mixed methods approach is suitable for these purposes (Venkatesh *et al.*, 2013). For the confirmation, the thesis confirms the findings of both parts by incorporating insights from the qualitative analysis with further test of quantitative analysis. The qualitative interview data takes the responsibility in providing in-depth views about contexts in location-based information, which is helpful for assessing the boundary conditions and noticeable considerations that individuals will incur during the sharing of location-based information

(Venkatesh *et al.*, 2013). Accordingly, the use of quantitative method in acquiring exact links and mechanisms within various contexts will be a confirmation and extension of the qualitative knowledge - thereby opening fresh avenues for future research (Venkatesh *et al.*, 2013). Finally, because this thesis seeks to integrate contexts of location-based information, which is underexplored in its meanings and structures, to explain the associated sharing behaviours, the qualitative study is conducted prior to the quantitative study in our sequential mixed methods approach (Venkatesh *et al.*, 2013; Venkatesh *et al.*, 2016). Subsequently, based on the insights gained from the qualitative study, the proposed hypotheses are tested through quantitative methods with corresponding designed scenarios.

Specifically, the qualitative study in this thesis will explore the main themes and topics of individual's sharing of location-based information on social media. And by the identification of key aspects through the data analysis from the data collected through interviews on individual's past experience, the qualitative study will generate a framework that is composed of the combinations of factors derived from these key aspects. The contribution of qualitative study to the quantitative study could be summarized into the following two parts. The first contribution is that the findings of the qualitative study (i.e., the framework of contextual factors in location-based information) will provide a foundation for the discussion of critical issues in quantitative study. Secondly, the investigation of the conceptualization of key aspects in location-based context will offer helps for the statistical examination of relationships among antecedents, processing systems, and sharing behaviour under various contexts. And the findings from qualitative will also be used as prior evidence that can be cross referenced after the quantitative study. In short, the qualitative study will take the responsibility in building and measuring the bounds between contexts, and also to provide insights for the possible dynamics to be validated and confirmed in the result of quantitative study.

Having described the appropriateness of adopting a mixed-method approach for this research, the next step is to develop meta-inferences and validate the quality of this methodology. Inferences in mixed-method approach are largely guided by the exploration of insights through a qualitative analysis, and then be further

corroborated by a quantitative analysis on individuals' perceptions, behaviours, and feelings in a coherent and systematic manner. Meta-inferences are thus obtained in mixed methods by integrating and synthesizing the findings from the quantitative and qualitative analyses (Venkatesh *et al.*, 2013). To develop these meta-inferences and assess their quality, it is imperative to first discuss the quantitative and qualitative research separately. Following Venkatesh *et al.* (2013) integrative framework, this thesis highlights aspects related to the design quality of quantitative and qualitative studies in terms of related design, analysis, and inferences.

4.3 Qualitative Method

4.3.1 Interview Design

Venkatesh *et al.* (2013) suggested design validity is vital for the success of qualitative research, and it will be thoroughly discussed in the following sections. Design validity concerns how well a qualitative study is designed and executed, so that the findings are credible and transferable (Venkatesh *et al.*, 2013). The analysis and the interpretation must be accurate for understanding the thoughts, feelings, experiences, and intentions of the interview participants. In the present study, design validity is ensured by maintaining rigor in selecting the interview participants and giving them freedom to communicate their thoughts.

Thirty active social media users on a campus of university in China were contacted to participate in the interview. Current study chose the respondents through the distribution of recruiting advertisements on the campus forum. And the requirement to determine whether the participant is valid depends on their knowledge or actual usage of location-based services. Specifically, the recruiting message strongly advised that participant should be familiar with the popular social media sites and applications, such as WeChat, Facebook, Weibo and location-based service providers like Dianping.com and Foursquare, and should also have shared location-based information (e.g., check-in, photos, textual descriptions, etc.) at least once. The mentioned platforms and applications in the message are selected because they have been regarded as the main media in most countries through which people make extensive communications and have occupied a large proportion of user base worldwide

(Kapoor *et al.*, 2018). Prior to sending out the recruiting message to ask them to participate in the interview, they are further checked with the length of usage on related platforms, the number of friends, and the frequency of content sharing on these platforms to make sure they can provide valuable insights in their active daily usage. Upon confirming them as active users involved in content sharing activities on social media, they are further requested to provide evidence that they have shared any content on their timeline on Facebook or Moments on WeChat. Figure 4.1 presents the semi-structured interview questions used in this study. Of the thirty participants contacted, twenty-five agreed to participate in an interview.

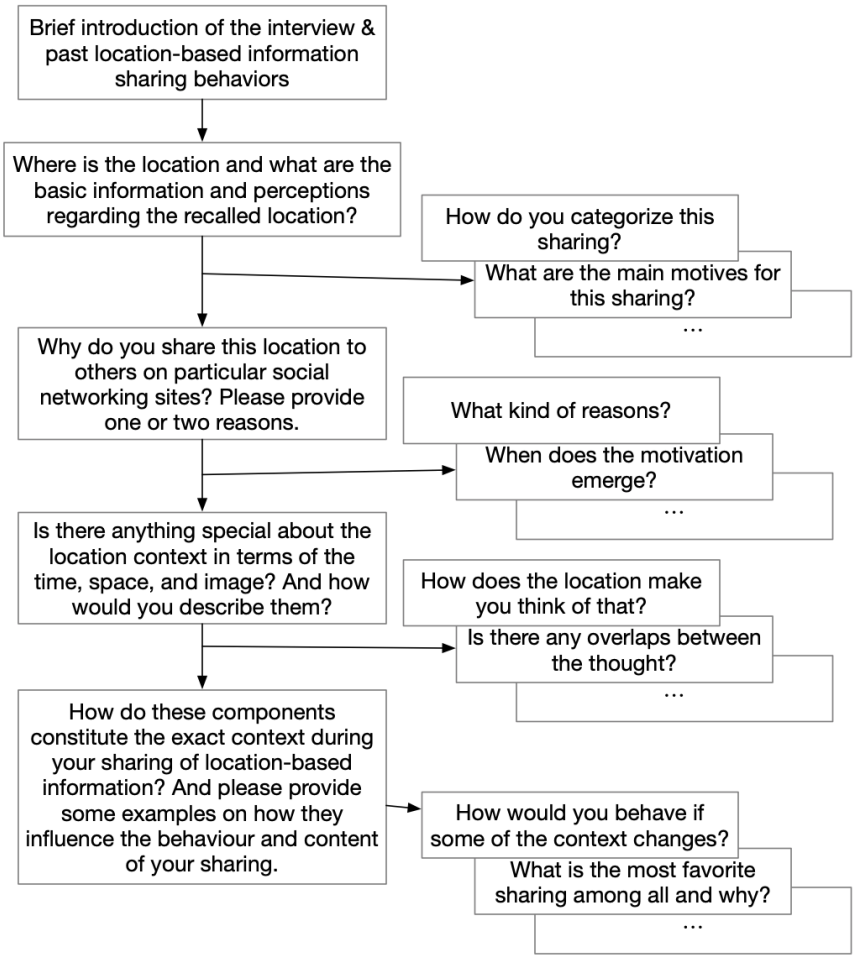

Figure 4.1 Flow of Semi-structured Interview Questions

Since most of participants in the study are recruited within the campus, they are active on social networking sites and related applications, which matches with the fact that campus students are the main user base for these services. Also, along with part of the participants recruited are employees in the campus, and recommended relatives by the participants, the overall sample of the qualitative study can perfectly reflect the actual usage patterns on social media platforms. Their responses, which came from a different perspective from where they came, what they have experienced, provide diversity in perspectives, and thus the findings from the qualitative study can be used to build solid foundations for the following quantitative research, thereby providing basis of understanding (Venkatesh *et al.*, 2013; Venkatesh *et al.*, 2016). As most respondents were Chinese, the interviews were conducted through mandarin Chinese, mostly through face-to-face communications. For all respondents, the interviews were audio recorded and later transcribed for analysis. All twenty-five respondents were experienced users of social media, and most respondents had more than five or more years' experience in using social media activities. The interviews were taken within a two-week window in June 2021, and the average duration of interviews is 51 minutes, with a minimum of 35 minutes and a maximum of 67 minutes.

4.3.2 Participants

Participants were twenty-five Chinese residents whose ages ranged from 18 to 53 years old. This sample size is larger than many place- or location-related studies that have used content-analysed interview data, and was considered appropriate given the exploratory nature of the qualitative research (Scannell and Gifford, 2010). Participants represented various backgrounds, occupations, and level of education, ranging from high school diploma to PhD. Participants reported that they had lived in their current area from 4 months to 15 years. The sample was younger, more socio-demographically diverse, and more highly educated than the general population, which is similar to other location-based information sharing studies (Tang *et al.*, 2010). The profile of participants is presented in Table 4.1.

Table 4.1 Profile of Participants

Participant	Gender	Age	Education
#1	F	24	Master
#2	F	25	Master
#3	M	27	Doctor
#4	F	21	Bachelor
#5	M	29	Doctor
#6	M	20	College Student
#7	F	35	Bachelor
#8	M	25	Bachelor
#9	F	19	College Student
#10	F	38	Master
#11	M	53	Bachelor
#12	M	30	Doctor
#13	M	18	High School
#14	F	26	Master
#15	F	20	College Student
#16	M	22	Bachelor
#17	F	35	Master
#18	M	28	Bachelor
#19	M	26	Master
#20	F	29	Doctor
#21	F	31	Bachelor
#22	F	22	Bachelor
#23	M	23	Master

After signing up for the study before the official interview, all participants were introduced about the process and detail of the following interview, as well as some basic information about the history and functionality of the location-based information sharing services. Participants were then provided with a brief introduction of the main structure about the interview, and were asked to recall at least one location that they have shared on any of social media platforms that are mentioned in the previous section. Then the participants will be asked questions in four main categories: (1) Where is the location and what are the basic information and perceptions regarding the recalled location? (2) Why do you share this location to others on particular social networking sites? Please provide one or two reasons. (3) Is there anything special about the location in terms of the time, space, and identity/image? And how would you describe them? (4) How do these components constitute the exact context during your sharing of location-based information? And please provide some examples on how they influence the behaviour and content of your sharing.

4.3.3 Content Analysis

For the specific analysis method, the content analysis is used to extract meanings from participants' responses in the interview (Weber, 1990). In content analysis, quantitative coding schemes are applied to subjective material, such as personal accounts, media, or responses to interview questions; third-party coders analyse these documents for particular codes and themes (Smith, 2000). This approach was taken because it provides detailed information useful for exploratory research and theory development. Content analysis is also considered more reliable than other types of qualitative analyses, given its use of a detailed coding scheme, and the opportunity for data to be coded by multiple raters (Smith, 2000). Furthermore, this qualitative descriptive approach is intentionally categorical, interpretive than some other methods, and produces a complete and valued end-product in itself (Sandelowski, 2000).

Coding occurred in two rounds. The first involved an inductive approach, in which two researchers coded the recorded and transcribed responses for evident perceptions and reported considerations of participants using the QSR NVivo9 software. These coders were PhD students in the same campus as where the participants were recruited, therefore it can reduce the degree of difficulty in understanding the context and identifying relevant terms. However, these coders were unfamiliar with dual-process models and attachment theory, which helped to ensure that the emergent findings were guided by the data itself rather than by pre-existing expectations. They were trained and provided with a manual with instructions and examples of coding. Responses could be coded into more than one category if the coder viewed it as fulfilling more than one factor. For example, a response such as "this place evokes memories of time spent together with my family" could be coded into the categories of "place memories" and "connection to family." After familiarizing themselves with the manual, the coders then independently coded three new responses, after which their codes were discussed, and disagreements were explored. They then coded another round of three responses, which were again discussed.

Following this training session, the data were then independently coded by each coder, who identified apparent reported factors afforded to the participant by their usage and behaviour toward location-based information sharing. The

coders reviewed the themes after the first 10 and 20 participants to discuss disagreements, and to refine the emerging structure of categories. Themes were merged into larger categories where appropriate. Once complete, the lists from each coder were compared and commonly listed factors were retained. A second round of coding was performed by two research assistants, who were also unfamiliar with related theories. After a training session to learn the coding scheme that had been previously created, they independently coded the data, determining whether each factor was present or absent for each participant. They used open coding to determine the type of each categorized factor.

After the collection and organization of interview responses, the qualitative data is analysed into general themes representing the core sets of constructs. The patterns were manually coded regarding the determinants of location-based information sharing. A multiple classification scheme is used, so that each response could be classified into one or more categories (Bhattacherjee and Premkumar, 2004). The coding was done independently by the two researchers, with each response coded into one or more of the categories. The coding scheme was jointly derived based on the research questions and the constructs. The unit of data analysis is the decision-making scenario of location-based information sharing. Data analysis was intended to identify appropriate concepts and the associations among them. The focus of coding was on the context in which the decision occurred and on the decision-making process. The coding process began with code development and concept identification followed by relationship identification (Hsieh and Shannon, 2005). Table 4.2 provides an example to illustrate the coding.

Table 4.2 Examples of Scenario Coding

Categories	Code name	Examples
Interactions	Interpersonal relationship	*My mom always took me there to have lunches*
	Activity	*It is a good place to have a drink after work*
	First experience	*I have never seen a place like this before*
Expected outcomes	Others' comments	*he may think I am lazy and didn't do the job at the working hour*
	Social interactions	*helps me to attract more likes and comments on WeChat Moments*
	Tangible rewards	*Because they offer coupons for me to check in there*
Adjective	Subjective	*That place is so much of fun*

	Objective	*It is a small house which located just 50 meters away from the cathedral.*
Sharing decisions	Audience	*Every time I return to my hometown, I will share the train station to tell my friends I am back.*
	Date and time	*It was a Christmas Eve*
	Platform	*I shared it on Dianping, because it is a requirement to maintain the account benefits*

After the initial coding, codes were examined to identify concepts as well as their properties and dimensions. For example, the researchers noticed several phrases that related to objects, resources, infrastructures, or generally tangible elements of the natural or built environment that constitute the context for decisions. These aspects were labelled physical context according to previous literature (Scuttari *et al.*, 2021). Physical context was then scrutinized in terms of its dimensionality by classifying all datapoints connected to this concept. The second concept identified in this phase of the coding process was social context, which includes encounters and negotiations in space (Scuttari *et al.*, 2021). Social context is described in the literature as interpersonal aspects, such as the number of other players, others' experience or expertise, others' similarity to self, as well as the communication process (Belk, 1975). Given the discrete, complex, and fragmented nature of data, the coding phase included several cycles to develop codes and identify concepts. This iterative process maximised optimal fit and minimised bias from preconceived notions.

4.4 Quantitative Method

4.4.1 Research Design

To test the research hypotheses proposed in the previous section, a survey instrument (with items on a seven-point Likert scale ranging from strongly disagree to strongly agree) was developed by identifying and adapting appropriate measures from the existing literature. Firstly, the designed preliminary questionnaire was tested with three students whose research are in the same area, then their feedback about the readability and clarity of the survey items were considered and incorporated in the final instrument.

The sampling frame in selecting the appropriate participants comprised location-based service users who use such services to share related information which

can be seen by others to achieve certain volunteering aims (such as fun, gaming, and socializing) rather than for work-oriented activities like collaborations, and this was indicated as the qualifying criterion for the respondents, enforced via a question in the survey. Moreover, to ensure a basic knowledge and understanding about related contexts and usage of location-based information sharing services, the survey is further required to be answer by participants who have used related platforms (i.e., Dianping, Foursquare, or any other location-based tag sharing functions, etc.) for at least one years with more than 10 times of sharing. Among a total of 257 candidates invited to participate in the survey, 226 of them agreed and fully complete the whole questionnaire online. In addition, for the aim to motivate the participant to take part in the survey, the project is described as a beta test for a location-based information sharing program based on the MiniProgram platform of WeChat, and the ones who completing the questionnaire will be rewarded with 5 RMB per person as a compensation for their participation.

This thesis developed hypotheses to examine the effects of location-related factors on the sharing behaviour of location-based information, and scenario-based studies were conducted to test the hypotheses. Each scenario will focus on one context-related factor combination derived from the qualitative study. Each dimension in these context-related combinations was manipulated by sending a certain type of message to the participant to activate their corresponding perception toward the dimension. The method is appropriate for this study for two reasons. First, scenario-based study explore the effect of variables that can be manipulated (Cook *et al.*, 2002). And this study focuses on the effect of context-related factors during location-based information sharing that can be manipulated. Therefore, it can test the effect of the difference between these context-related combinations. Second, the unique strength of scenario-based method lies in describing the consequences that result from manipulating a treatment. Therefore, through manipulating the context during location sharing, this study can show how they can influence the individual's perception toward locations, which in turn impact the sharing behaviour. Hence, since this study aims to examine people's impulsive versus reflective processing

when dealing with sharing decisions, scenario-based methods are appropriate to manipulate the influence of cues (Dinev and Hart, 2006).

However, the weakness of this scenario-based survey is extensively discussed in past studies. Firstly, as the performance of the survey in manipulating the individual's perception largely depends on the effectiveness of information cues, the design of the information presentation and survey process will be the key to the success of this methodology. Therefore, to ensure that the participants who provide responses in this thesis is truly understand the context provided through information cues, a manipulation check is utilized to guarantee the effectiveness of the manipulation in the scenario design.

Secondly, since the scenario-based survey will use fictitious environment to mock the actions that participant will take in real world, a serious challenge will be how to make sure they are expressing the real behaviour rather than the intentions. And to solve this challenge, this thesis embedded the measurement of sharing behaviour within the MiniProgram to create a closed cycle for the behaviour environment. Instead of measuring the behaviour intention in the questionnaire, the method is more reliable in collecting the real behaviour in a fictitious environment.

Lastly, compared with other secondary data which captures the real behaviour of users on location-based information sharing platforms, this scenario-based method is less reliable due to the less sample size and limited diversity in the demographic information of participants. But because this thesis aims to combine the understanding from qualitative study and the validation of quantitative study together to provide insights on the dynamic of location-based information sharing, the main task of the quantitative study should focus on the compatibility with the qualitative findings. Therefore, the scenario-based survey is an appropriate choice that could best utilize the findings from the qualitative study to design the scenarios, and to test the statistical relationships with this framework.

4.4.2 Scenario-based Survey Domain

WeChat is the most popular mobile social media among Chinese users, and users can share personal information, which will appear in "Moments" and become

accessible to other users. According to a report published recently (Pang, 2021), among all the functions, “Moments” is the most popular function, with 61.4% of users checking updated “Moments” every time they log in. Out of all the information available through “Moments,” 61.4% of users pay the most attention to the updated statuses of their connections. Consistent with previous literature on information sharing (Choi *et al.*, 2015), the WeChat environment was chosen as the platform for the present study for two main reasons. First, it is widely used among Chinese users, so subjects feel familiar with the environment. Therefore, the findings from the study may be generalized to Chinese SNS users in general. Second, WeChat provides the functionality of specifying the sharing options such as target groups, lasting time, and mentioning people, etc. Thus, it allows users to choose the most appropriate strategy in sharing information to others, and also provides great settings for this study to investigate the exact sharing behaviour when share location-based information.

Figure 4.2 A MiniProgram Designed for the Information Sharing of Brooklyn Museum

To make the scenario-based environment close to the real environment, a MiniProgram was developed with the help of toolkit provided by the official WeChat application. The MiniProgram was announced and launched by WeChat to integrate external service experiences into the native usage scenarios of the application. Therefore, with the enriched MiniPrograms in both quantity and quality, its importance has been valued by most of the existing services providers on the market. Besides, considering the mutual benefits that this functionality can provide for both parties (i.e., to improve user experience of the WeChat application, and to attract more users for third-party services providers), the usage of MiniProgram has been widespread and adopted by many service providers including the location-based information sharing. Especially, the importance of this emerging technology has drawn an increasing attention from the business of information sharing and marketing, such as museums and public services. As shown in Figure 4.2, the museum could utilize the MiniProgram to facilitate the sharing of basic information about the exhibitions. Compared with the traditional applications, the MiniProgram consume less storage and bandwidth, which makes it a perfect selection in providing services in the mobile era. Specifically, in this study, the system showed the description of the scenario in an application interface and simulated the process of a promotion message toward the particular location. And thanks to the openness and accessibility provided by the MiniProgram interface, the experience provided by the designed system look exactly like the real interfaces of WeChat to ensure the realness of the system.

4.4.3 Manipulation Design and Survey Items

The scenario simulated context-related factors using a hypothetical description. Hypothetical scenarios have been applied in previous IS research (Okazaki *et al.*, 2012; Xu *et al.*, 2009). This method is valid for this study for two main reasons. First, people's perception toward certain places and decisions is context-dependent (e.g., dependent upon the time, place, and the content of the message) and varies along with the context changes (Acquisti *et al.*, 2017). Second, the motives and psychological processes measured by surveys may represent people's general perceptions, rather than specific context-related behaviours (Smith *et al.*, 2011), and is subject to the effect of biased phenomenon like

privacy paradox (Acquisti *et al.*, 2017). To better examine the real psychological process triggered by locations, a hypothetical scenario is used in this study. To create a relevant scenario, this study followed the design and the description of some of the most popular location-based services, examples include MiniPrograms like Dianping and Meituan, and other check-in services. As this study focused on messages that aims to provide location-related information and facilitate user's sharing behaviour, among several popular examples, sharing messages related to restaurants was chosen given the commonality and accessibility of the information. Finally, to create messages about context-related factors, the findings from the qualitative study will be used to build scenarios and be validated through manipulation check process.

Since the data will be collected through scenario-based survey, the design for the scenarios is the key to the success of this methodology. As criticized in past studies, the "realism" is the key issue that needs to be handle during the usage of this method. Specifically, respondents will read a hypothetical scenario and are then asked to express how they feel about the described situation. Since the respondents may not be familiar with the described setting, so they will highly likely be limited in understanding the situation and not be sufficiently simulated to have a strong emotional response to the scenario. To overcome this problem, some researchers have focused on mocking the real scenes or interfaces that individual will encounter in the real world (Cook *et al.*, 2002; Mettler and Winter, 2016). However, considering that the scenario-based methods make inferences about real life, one of the most important questions is whether the responses generated from the method can accurately predict the nature and genuine behaviour of respondents. Thus, in this study, a complete and systematic program is developed to mock the whole sequence of how a location-based information is viewed, processed, and shared on WeChat, so that respondents will not be interrupted during the manipulation, and their reactions could be ensured genuine.

Specifically, for the design of manipulation in scenarios, the first task is to determine what type of location should be used to carry the manipulation. Firstly, for the type of location used in the scenario-based survey, past studies claimed that information about restaurants has dominated the location-based information

sharing services (Cheng *et al.*, 2011), and the number of restaurants in applications like Foursquare and Dianping have outnumbered other categories. Thus, the restaurant is chosen as the type of location that will be used in the scenarios, to ensure the generalizability and realism of the material. Specifically, the material provided to the respondents will be consisted of two main parts: after the initial introduction of the scenario, the first part will be presented to respondents as a background information to inform them about the past activities and basic information (i.e., where the restaurant locates, the exterior decoration, and the main selling point) of the location. At the end of this part, the message will tell respondents that this location has developed a page of information to introduce itself to potential customers, and then it will redirect the respondent to this page. After, the second part, which includes some photos, a paragraph to describe the restaurant, and some entries of reviews provided by others, will be shown to the respondents. Once the respondent thinks it is okay for them to make decisions, they can click the button at the bottom and choose whether to share it to others. And lastly, the page will automatically redirect to the online survey to capture their perceptions during the scenario manipulation. Specifically, following the guidance of the mixed-method approach, the exact information manipulations used in the scenarios will be subject to the findings of qualitative study, and the details about manipulations will be presented in the data analysis chapter for quantitative study.

This study individually distributed web-based questionnaires to participants through one of the biggest survey service platforms in China - Wenjuanxing.com. The high rate of usability is attributable to the fact that the survey was administered individually with the help of a few students on their social networks. In addition to the focal research constructs, suitable control variables are incorporated in the research model. The age and incomes of the participants are controlled, as McKnight *et al.* (2002) found this to have a significant relationship with the actual sharing behaviour.

For our data analysis, partial least squares (PLS), a latent structural equation modelling technique, are used as implemented in SmartPLS 3.0, which utilizes a component-based path modelling application (Hair *et al.*, 2013). PLS technique provides a better explanation for complex relationships (Hair *et al.*,

2011) and is widely adopted by IS researchers (Sun, 2012). Moreover, it is suitable when the focus of the research is on theory development. Following the two-step analytical approach (Anderson and Gerbing, 1988), the psychometric assessment of measurement scales is first conducted, and then the structural model is evaluated. Using this approach, this study could achieve a higher confidence that the conclusion on structural relationship is drawn from a set of measurement instruments with desirable psychometric properties. Besides, PLS avoids the two major problems of inadmissible solutions and factor indeterminacy and thus is suited for analysing models with latent variables (Pavlou and Gefen, 2005). It is also well suited for estimating moderating effects Pavlou and Gefen, 2005). Finally, many IS studies have employed PLS and found it to be an effective method for data analysis (Venkatesh and Windeler, 2012).

4.4.4 Measures of Constructs

All measure used in this thesis are 7-point Likert-type scales, composed of a varied number of items. In the following sections, the scales and measurements used in the study are presented and discussed related to their reliability and validity.

First, for the measurement of place attachment, scales that evaluate place attachment as a multidimensional construct with different numbers of factors are proposed in past studies. Among the most adopted ones, the scale by Williams and Vaske (2003) identified potential items related to two main factors: place identity (e.g., “I feel X is a part of me,” “I identify strongly with X”) and place dependence (e.g., “X is the best place for what I like to do,” “No other place can compare to X”). Several studies focused on the validation of this scale. Williams and Vaske (2003) performed a confirmatory factorial analysis to ratify the existence of the abovementioned factors and to test the validity of the proposed twelve items. Additionally, they also substantiated the convergent validity of the scales using three independent variables that they deemed related to attachment: frequency of visits to the place, perceived familiarity, and degree to which the place is considered special. An interesting result of this work is that attachment measurements are found not to be generalizable across dimensions (i.e., scores on the one dimension cannot be generalized to another), suggesting that identity

and dependence are phenomena related to place attachment, but not necessarily dimensions of it. Furthermore, the items adopted from Williams and Vaske (2003) were then modified to suit the environment of social media and digital location-based information.

Moreover, the measurement for the location-based sharing behaviour is directly obtained through the participant's choice on the scenario-based domain. Participants in the scenario-based survey will be asked to choose the level of sharing intention at the end of MiniProgram processes. For other constructs, the measurements for them are all from the well-established and reputable publications. Specifically, the measurement for privacy awareness is adopted from Zhao *et al.* (2012), the self-esteem and continuity are adopted from Wang and Xu (2015), the social-bonding is adopted from Kyle *et al.* (2004), the belongingness is adopted from Algesheimer *et al.* (2005), the reputation gain is adopted from Wasko and Faraj (2005), the emotional benefit is adopted from Tsai (2012), the altruistic benefit is adopted from Davenport and Prusak (1998), and the relationship benefit is adopted from Bock *et al.* (2005). The detailed measurement items for each construct are illustrated in Table 4.3. Lastly, for the measurement of individual's sharing behaviour, it is measured directly through the MiniProgram by asking the participants to choose the level from 1 (don't share) to 7 (will definitely share) of willingness to share this content on their timelines of WeChat Moments.

Table 4.3 Measurement Items for Constructs

Construct	Items	Sources
Place Identity	I feel the place I see on the page…	Williams and Roggenbuck (1989)
	is a reflection of me.	
	says a lot about who I am.	
	makes me feel that I can really be myself there.	
	reflects the type of person I am.	
Place Dependence	In terms of goal accomplishment of life/work/social, I feel the place I see on the page…	Williams and Roggenbuck (1989)
	is the best choice for what I want to do	
	is hard to be substituted to any other place for doing the types of things I do.	
	is more important than others.	
	is incomparable.	
	gives more satisfaction out of visiting.	

Privacy Concerns	I am concerned that a person can find private information about me on the Internet.	Zhao *et al.* (2012)
	I am concerned about submitting information on the Internet, because of what others might do with it.	
	I am concerned that the information I disclose on the Internet would involve many unexpected problems.	
	I am totally unconcerned that the information I disclose on the Internet would bring about privacy-related problems (reverse item).	
Self-esteem	It feels like a personal compliment to me when someone praises it	Wang and Xu (2015)
	I feel embarrassed if someone criticizes it	
	I feel proud to be connected with it	
Social Bonding	My friends/family would be happy if they see me checking in there	Kyle *et al.* (2004)
	I rely on this location to communicate with my friends/family	
	This location is preferred over other places by my friends/family	
Belongingness	I belong in this place	Algesheimer *et al.* (2005)
	This place is home for me	
	I am totally comfortable being in this place	
Continuity	The place I see can…	Wang and Xu (2015)
	make me feel it is very meaningful to me	
	reminds me about my past	
	evokes strong memories for me	
Reputation Gain	I can earn respect from others by sharing this location.	Wasko and Faraj (2005)
	Sharing this location would enhance my personal reputation online.	
	Sharing this location would improve my status online.	
Emotional Benefits	The sharing of this location can boost my mood	Tsai (2012)
	The sharing of this location can smooth my concerns and worries	
Altruistic Benefit	I can help other people through sharing location information	Davenport and Prusak (1998)
	Sharing and commenting on locations can help others with similar problems	
	I enjoy helping others through sharing locations	
Relationship Benefit	Sharing this location would strengthen the tie between other users and me.	Bock *et al.* (2005)
	Sharing this location would create new relationships with new friends online	
	The location sharing would expand the scope of my association with other users online	
	The location sharing would draw smooth cooperation from outstanding users in the future	

	The location sharing would create strong relationships with members who have common interests online.	

4.5 Conclusion

Given the complexity in understanding the context of location-based information on social media, this chapter provides the justification for the adoption of a mixed-method approach. Besides, it also provides an introduction on the relationship and structure between the qualitative and quantitative methods. For the qualitative study, this chapter presents the design, participant, and analysis of the interviews. And for the quantitative study, the design for the scenario-based survey is proposed with the targeted domain. Also, the measurements for the follow-up study are also illustrated.

Chapter 5 Data Analysis and Result: Qualitative Study

As mentioned in previous sections, the concept of a place is more complicated than obtain a piece of coordinates (Goel *et al.*, 2011). Through adding recognized names or nicknames to specific coordinates, social communities transform coordinates to locations, and use them for easier communications between each other. Furthermore, by attaching personal or collective meanings to locations, individuals will form the concept of places, which differ from locations in terms of psychological or physical bonds.

Based on this fundamental classification, numerous studies have been conducted to investigate the types, taxonomies, and different characteristics of places, and their influences on individuals' perceptions and behaviours. Freundschuh and Egenhofer (1997) have proposed a general framework for the taxonomy of spaces, which includes the degree of manipulability, level of locomotion required to experience the space, and the constraints of size upon the spatial experience. Based on these three indexes, they have categorized spaces into six different types, and this can be seen as a starting point in the classification of spaces.

However, following studies have argued that this taxonomy is based on the characteristics of space, instead of contexts around the space, especially the critical factors that form the concept of place (Scannell and Gifford, 2010). Although past studies have emphasized that the physical and social contexts are important during the formation of meaningfulness within the location (Evans and Saker, 2017), the exact implications of related aspects in location-based information on social media have not been discussed systematically yet. Thus, the new perceptions and forms of these three components will be investigated firstly to provide insights for the formation of context about the location on social media.

5.1 Space, Time, and Identity of Location-based Information

5.1.1 Space

Firstly, for the demonstration of space in location-based information sharing, traditional studies mostly rely on the discussion of space to frame the perceptions toward the structure, style, and coordination of components within an area or a location. From the discussion on the variation of these concepts, they have proposed several characteristics of the context in a location, such as navigability, capacity, and linkages, etc. (Freundschuh and Egenhofer, 1997) However, these characteristics are only able to be accessed in the offline environment. That is, although these factors may still be effective in affecting individuals' perceptions in the digital form, their effectiveness may be either weakened or strengthen because of the mediated information sharing process through mobile networks (Farman, 2020). Individuals may not have the opportunity to physically visit the location, and this lack of common sensory perceptions will force the information to include only the content that are relevant or easy to understand (Raymond *et al.*, 2017). Consequently, it will lead to biases in the content selection from the perspective of both the sender and the reader to form a special pattern in the mobile communication of locations.

More specifically, one of the most commonly used strategies found in participants' responses is to carefully share features that could best describe the space characteristics of the location. Besides, the exact word in describing these features have also shown a clear tendency on the ones that are straightforward and well understood among the audience. Examples could be found from participants like:

> *"Ah, I remember my last sharing of location is in a Café. You know, it is a very famous one in town, and is good for taking selfies." (Participant #4)*

From this expression, 'good for taking selfies' is clearly a description for the space feature of the café. It is not a direct statement of how big the space is, or how beautiful it is. Instead, concise expressions are preferably used to deliver a commonly shared impression of the location. For example, 'good for taking selfies will create a vivid imagination of a classic and well-decorated café,

similar to other popular ones on social media. This kind of impression is constructed through the knowledge obtained from social media usage, and this concise expression is only a keyword to deliver the meaning. And when reflected in the discussion of space characteristics, the content shared to others will be preferred if it can easily build a general image of the location. This could be seen as an echo of the whole picture, that social media has forced and trained users to communicate with concise and simplified contents, and some of the most well-known examples in this trend is the usage of emojis and Twitter.

Another clear pattern found in responses is that participants tend to express a lot about companions and others within the location, like the expressions:

> *"Even I have been there before, but that time is different because I was with my best friend." (Participant #7)*

> *"I have never seen so many people in a single place, it is like a big family, and I enjoyed it so much." (Participant #15)*

These two paragraphs have illustrated another distinction in describing space-related factors - the people. Start with Lynch (1960), similar past studies normally only consider the physical elements of location as the components of space perceptions. However, this assumption has been seriously challenged in the social media era (Evans and Saker, 2017). On one hand, the concept of location has moved beyond only the physical form of cement and stones, the location-based information now could represent the activity, relationship, and even the social connections within a specific space (Mehrotra *et al.*, 2017). In fact, the companions expressed from participants include both strangers and friends. In another word, the situation of going somewhere together is not a necessary condition for participant to include companions in their responses. It seems that individuals take others (no matter whether they know them or not) as a part of the concept of space, and this addition indicates that human factors become an inseparable section in describing spaces. For example, the expression of participant #7 reflects that the companion of the best friend could make a location 'different' from past visiting. Also, the expression of participant #15 shows that the local people and the atmosphere created by the surrounding crowds could modify the space through the creation of different feelings.

In addition, apart from a component embedded in the space, the togetherness, or being accompanied by others could also influence how people perceives the location. For example, the cinema you went with your partner will be perceived as more romantic and memorable than the time you went alone. The speciality and closeness of such relationship could decorate the location and attach great meaningfulness to the location. As expressed below:

> *"This sharing of location reminded me of the experience with my ex-boyfriend there. I went to that restaurant frequently since I was a little girl, and that is the first time I brough him there." (Participant #17)*

It is obvious that the companion of her ex-boyfriend made a huge difference in perceiving the location. And one thing needs to be clarified here is that this does not mean the location itself is not important. It can be inferred from the expression that the location (i.e., the restaurant) also means a lot to the participant, since she has been visiting there when she was young, and the combination of this bonds with location and the partner's company jointly creates the perception of this location at that time.

5.1.2 Time

Besides the space factors, another kind of change social media has brought to the perception of location context comes from the time. As mobile technologies have been long recognized as a perfect solution to allow people access resources anytime and anywhere, it also modifies the perception of individuals about time during the sharing of information online (Saker and Evans, 2016). Firstly, the most obvious pattern that could be extracted from responses is the strategies participants adopted in selecting an appropriate time for the sharing. Undoubtedly, this kind of expression is enabled by the functionality provide by devices like smartphones to store the information about the location, so that individuals could choose to share it later when they think is appropriate (Frith, 2014). Interestingly, although it seems this functionality has little to do with the perception of location context, it does link with the process of how people treat the location-based information, as the expression shown below:

"That place is so much of fun! But I didn't share it immediately, because I am afraid that this sharing will be found by my supervisor, and then he may think I am lazy and didn't do the job on weekdays." (Participant #4)

This example shows that the time may posit real concerns on individuals if it is inappropriate to show it to others. Like indicated in this expression, the weekday is clearly not a good timing to share a place that is 'so much of fun', because it represents an attitude that the sender may not want to do the boring job, but to have fun instead. The 'weekdays' here also represents a meaning of duties and obligations afforded by the time, and it contributes to the consideration of appropriateness in the sharing. Nevertheless, the ability to change the time for the sharing pushes individuals to rethink the sharing behaviour, and it somewhat gives these messages another opportunity to be shared after careful considerations.

Another important factor mentioned about time in responses is related to the marking of specific moment. Among these expressions, this kind of message is commonly linked with festivals, holidays, and memorial days. Some examples could be found below:

"That was the Christmas Eve that year, and I decided to spend the night at the shopping mall." (Participant #19)

"I have studied abroad for the previous three years before that Spring Festival, and that was first time I returned to my grandparents' house after I got back from overseas." (Participant #5)

This kind of expression illustrates that the time itself could also bear some meanings, and this meaning could be amplified with the combination of specific locations. Like the 'Christmas Eve' and 'Spring Festival' mentioned in the expressions, they are both important holidays in the western and eastern cultures, and are associated with certain activities, customs, and locations (Pons, 2003). Therefore, it can be observed that 'Christmas Eve' is related to the 'shopping mall', since in China there will large activities and promotions in the shopping mall, which makes it the centre of this festival. Similarly, 'Spring Festival' is

related to the ‘grandparents’ house’ because this festival means family union and ancestor worship. Thus, it can be concluded that these special days could remind people with certain locations, and makes sense to others when they are linked together.

Also, it reflects that the representation of a single location could be different at different time. The matching between the time and location could generate a wonderful experience that motivates individuals to share it to others. Or in another word, the time created a suited atmosphere for the location to be worthwhile for sharing. However, this change in the meaning of location itself over time could also influence the perception of location context. A good example is presented as following:

> *“During the day, there is nothing special about that location since it is a normal crossing on the road like everywhere else. However, when you went there at night, it becomes one of the busiest markets you have ever seen.” (Participant #13)*

This paragraph shows a vivid picture of how location moves and behaves over time. From a normal road that takes the responsibility of traffic at day, to a busy market that facilitates various activities at night, this location takes faces at the different time. And accordingly, this will certainly influence the message delivered by the location-based information. On the day, it is highly possible the sharing aims to tell the others where to meet, or the route to some destination. On the contrast, if the message is shared during the night, then it conveys more complicated meanings like invitation, life sharing, and maybe show-off.

5.1.3 Identity

Lastly, for the identity part, past studies believe that the location is an important signal to notify the others who and where an individual comes from (Proshansky *et al.*, 1983). Some common and well-known example of this phenomenon could be found from the calling of old age people to include their hometown in the title, and business communities and groups that are formed based on where the businessmen come from (Lalli, 1992). The identity provided along with the location could form a link through naïve trust, since the location itself contains the concept of same culture, same customs, and same languages (Twigger-Ross

et al., 2003). Correspondingly, the traditional formation of identity based on locations reflects a tendency to be included in a social group, in order to search for security and support. However, during the mobile era, the purpose of searching for identity are consisted more complicated factors than just being included in a social group.

Firstly, the booming of social networking sites enabled individuals to have multiple identities online (Evans and Saker, 2017), it could be achieved either through using different social platforms or carefully manage the content that are displayed to others. And this convenience in maintaining multiple faces online further offers the opportunity for individuals to reflect each of them through different locations. Some typical examples in responses are presented as following:

> *"My past sharing of locations mostly showed some of my favourite activities and hobbies. You can see, some of them are gyms, others like climbing clubs, and also bars. … I believe these records could show others who I am."*
> *(Participant #4)*

Within this part of expression, it is evident that the participant has revealed a matching between the shared locations and the hobbies. Instead of traditional concept of identity that is reflected in the location information, this expression has presented a more diverse and personalized form of identity. The identity based on location itself in the past could only tell people where an individual comes from. Instead, this expression shows that the location itself may not be important, but what is delivered through the locations matters in the identity announcement. For example, the location like 'gym', 'climbing clubs', and 'bars' are not simply locations to tell others 'where I am', they are also signs of activities, social connections, and personal images to others. When people show frequent sharing of 'bars' on social media, it generally means that he or she like to social with people and to hang out with others.

From this perspective, the location has become a unified body which contains a set of signals that could be used in building up specific identities. Hence, sometimes this way of using the location to emphasize the identity works in the

opposite direction of the traditional one. That is to say, if the traditional usage of location in reflecting identity is to seek for the joining of a community, on social media, this function could be used to demonstrate the highlights that differentiate individuals with others. Especially within the environment of social networking sites, the need to be recognized and attention gaining has been attached with great importance in the communication, like the expression below:

> *"It is a snow day when I got back to my hometown in the north, I shared the location because I believe most of my classmates have never seen a snow before." (Participant #12)*

Evidently, the share of location mentioned in the expression is to show something special to the participant's classmates, which may differentiate he from the others. But that does not mean this sharing is a statement to stay aside from the community in the class. Conversely, it could be seen as a strategy to emphasize the value of being different in the community, so that it could help the participant to gain more attentions and help him to maintain the relationships. In this instance, the 'snow' and 'hometown' are two strong indicators of his identity, an individual from the north, which makes him to be recognized in the class.

In addition, although it is stated that the sharing of location not only aims in searching for the inclusion of social groups, but this kind of purpose are also still one of major motivations for individuals to share location information. As shown in the below:

> *"About half of my sharing of location are together with my working group. We like to hang out together when we have time on weekend, and often when we were in the restaurant that we always went to, we will share it no matter whether we are together or not." (Participant #17)*

So here in this expression, the location has played a role in representing the community that one belongs to. However, the difference here is that this location is formed through collective interactions and activities. It is not something learned from ancestors or others, but an object that is constructed through a

process. It can be observed from the expression that ‘working group’ is an identity that associated with the restaurant they often went to. And also, this identity does not necessarily require the presence of related individuals, but could be directly linked with the location through past activities.

In summary, based on the responses from participants, all three components that were discussed in past literature have shown unique changes on social media. And one common feature that all three components shared in the transformation is that they all display an inclusion of social considerations, such as humans, relationships, social needs, in the formation of contexts. Similarly, in past literature related to the context of location, the taxonomy is often criticized for considering too many physical-related aspects, and the ignorance of social-oriented factors (Cresswell, 2004). In order to better understand the location-based contexts, recent studies turn to include more social factors in the shaping of location meanings, which in line with the argument that it is the bonding with the space forms the place.

Moreover, Harrison and Dourish (1996) proposed that the place should contain at least two dimensions, namely the physical dimension and the social dimension. And most past studies related to location-based information have claimed a distinction between social and physical perspectives (Mesch and Manor, 1998; Scannell and Gifford, 2010; Dwyer *et al.*, 2019). Thus, based on a further analysis on the coding scheme, the physical and social context of location-based information will be discussed.

5.2 Distinctiveness and Connectedness in Physical Contexts

Firstly, for the physical context, many past studies have provided features of space both online and offline, including the aspects like orientation, proximity in distance, partitioning, and popularity (Stedman, 2003). However, although these features have well suited the needs in past studies to explain individuals’ perception and behaviour when they act individually in the space, it requires further investigations to incorporate social media environments, where people always behave with social considerations. Hence, those features found in past studies need to be re-examined in their generalizability in the new age, and some

new features may evolve from the interactions with the place and others in the space.

Specifically, this study digs deeply into individual's perceptions towards locations on social media, and responses from the participants both acknowledged and supplemented the findings from past studies. Firstly, participants still show a strong attention toward the physical aspect of the place, as was expressed in comments such as:

> *"Every time I went to a place that is different from others, I will feel happy and want to tell my friends." (Participant #6)*

> *"It [the place] suddenly appears in front of my view, and I was shocked by its appearance because it stands out from its surroundings." (Participant #9)*

These quotes indicates that even in the social media age, individuals will still pay attention to the physical aspects of the place, such as the beautifulness, the specialty, and the genuineness. However, although these aspects are based on the basic features of space, the expressed physical-related aspects from participants tend to focus more on the social highlighted features. For example, past studies tend to use directions, coordinates, relational positions, and isolated shapes to describe a location (Lynch, 1960). However, these expressions show that individuals will emphasize the features from a comparative perspective. Words like 'different' and 'stands out from' indicate a comparison between the current location with other similar or nearby ones in making a judgement.

In another word, the terms used to describe the location by participants are to some extent related to other places, with adjectives such as special, superb, and different, which imply a comparison with imagined alternatives. Particularly, when the context is firstly narrowed down to contain only objects or terms related to the physical appearance of places, the word related to the appearance, relational attribute, and style are identified. These words could be easily extracted because they have strong connections to the description of places' exterior looks and positions, and some examples can be found such as decoration, equipment, city centre, and corner, etc. And by looking at the contexts around these words, the terms participants usually used along with are then identified.

From the sharing of these words, it is believed that individuals may reveal some clues about their motivations or at least perceptions toward the aspect of particular places. By looking into the characteristics of related words, two distinct directions could be clearly identified based on their tendencies and emphases.

5.2.1 Distinctiveness

When connect these adjectives with the sharing behaviour in the responses, some clear relationships could be extracted, and examples could be found from comments like:

> *"I only share the location where I believe is impressive to others, otherwise I think there is no point wasting both my and others' time in seeing this." (Participant #4)*

> *"That house is kind of old and has partly fallen into disrepair, but I think it is attractive since it looks so special and unique among other refurbished buildings." (Participant #5)*

These two paragraphs indicates that, the words used to describe the location have shown great effects in driving individual's behaviours. Clearly, the excellent appearance or decoration of the location is one of the most deterministic factors in attracting individuals' attentions. Some participants even expressed that it is a necessary condition for them to share related location information like participant #4, who claims that it will be a 'waste of time' to share locations that are not 'impressive'. Also, the attractiveness mentioned in the later expression comes from the old appearance, which makes it 'special' and 'unique' among nearby buildings. This phenomenon could be explained by the nature that people like things that are different or interesting, along with the benefits that these features could provide in helping individuals to gain attentions and reputations.

Individuals express extensive opinions on their preference for the difference that location may possess on any attributes, such as the outstanding exterior over the surroundings, the possible one-off experience at the place, and the unique style location has when compared with similar or nearby ones (Schwartz, 2014).

However, the term difference may not be suitable to conclude this direction of expression since the implicit meaning behind those comments implies more complicated mechanism beyond. Firstly, based on the emphasis on locations' recognizability over the surrounding environment, these comments share a lot in common with the traditional concept of difference. Like expressed by participants:

> *"The shopping mall is quite interesting, as it is newly opened and has many exclusive high-end brands inside." (Participant #10)*

> *"I can always identify that restaurant from other buildings at my first sight, because it is so colourful that you cannot miss." (Participant #18)*

These two paragraphs have presented two examples of how the sense of difference comes from. In the first expression, the uniqueness of shopping mall comes from both 'newly opened' and the 'exclusive' brands inside, which informs that the newness and exclusivity are sources for the sense of interesting toward a location. In the second expression, the participant claims that the restaurant could be easily identified among its surroundings 'at the first sight', with an emphasis on the special 'colourful' appearance. Also, this comparative difference could also be found in the sense-making of locations. And the most familiar situation of this usage is the tourist sharing of famous sites:

> *"I mean, it is the Eiffel Tower, you must tell others you have been there if you visit France. Don't you?" (Participant #5)*

This paragraph about the Eiffel Tower illustrated that it has been used as a statement of "I have been here". Obviously, it also reflects a certain level of uniqueness of the location, in the way to represent an area, a nation, and even a culture. Thus, the difference of this location does not fully originate from the sensory appearances, but from the representativeness it has on the concept that individual's intent to pass to others.

From this perspective, the most commonly related terms are believed to be the newness, the contrast with nearby objects and local culture, and the

conspicuousness of the location in direction-finding and sense-making. These terms are grouped together because they all reflect an attribute of location which makes it identifiable from the environment, and this feeling are usually obtained from the comparison with alternatives. Besides, these related comments also involve expressions about the rareness, the exclusiveness, and the timeliness of the visiting experience. These expressions emphasize heavily on the non-substitutability of some attributes that cannot be revised or found on other places. The meaning of this kind of expression can be summarized as the term of distinctiveness, which is defined as the degree of place's physical attributes to be identified in the surrounding or the outstanding status when compared with nearby or similar places in terms of quality and design of physical attributes.

5.2.2 Connectedness

Although the distinctiveness is regarded as one component in the physical context of location-based information, it does not reflect all types of perceptions toward the location in participants' responses. Apart from the expressions related to distinctiveness, others have claimed a corresponding direction in describing the location, as expressed in:

> *"Actually, there is nothing special of that location itself, I shared it because they are all the same and I just randomly selected one of them." (Participant #12)*

This paragraph contrasts with expressions in distinctiveness by stating the location has 'nothing special' itself, but the participant still implies that the sharing behaviour could be motivated by such kind of location. The phrase of 'they are all the same' indicates that the main impetus of sharing does not depend on any single location, but on a collective form that represented by these similar and connected locations. It also suggests an alternative direction in perceiving the physical context of location-based information. Furthermore, this type of physical context is usually associated with terms like similar, same, overall, etc. And the description related to this type of physical context will also involve discussions on location's surroundings and connections. For example, when describe a sharing experience of café overseas, a participant used the following comments:

> *"The appearance of the café was not special among the surroundings. I mean, the buildings there of course are different from our buildings in China, but they are all in the same style which can reflect the local culture." (Participant #5)*

This paragraph indicates that the sharing of this café was not caused by the distinct exterior of that building but caused by the (coincident) visiting to that place. Similar to the previous expression, it can be observed that the physical attributes of the café itself were not exclusive to its surroundings, but collectively, with the support of local culture and design styles, it facilitates a comparison on the nation or culture level. The café, along with the connections among other local buildings, have been merged into a unified concept to represent the 'local culture'. Interestingly, this seems like what was covered in the distinctiveness perspective of physical context, but they vary from each other in several aspects. The location used to represent cultures or nations from distinctiveness perspective is the iconic place that signals the core feature and image of the community. In other words, it takes a location out from its surroundings, and makes it as the tip of the pyramid to represent the whole wonder. Instead, the perspective that emphasizes connections and similarities will submerge a single location into its surroundings, and together forms a unified feeling of cultures. This kind of cognition could be reflected in expressions like:

> *"Each step in the old town could make me feel I was travelling in the history, and all the buildings around were connected with other in providing a sense of old times." (Participant #11)*

In this paragraph, the connection among surrounded buildings creates a sense of history for the participant. As such experience of local culture is based on daily activities, atmosphere, and integrated environments, it is hard to deliver a genuine sense through a separated location without the connection with surroundings. Also, this feel of genuine and local experience is also regarded as an important motivation for tourists to share location-based information (Munar

and Jacobsen, 2014; Kang and Namkung, 2016; Kim and Fesenmaier, 2017). Similar situations could also be found in participants' responses:

> *"There were two Starbucks there, one of them was modified to fit in with the style of that theme park, while the other remained the classic decoration. … I shared the modified one because it was well infused with the environment, and the other looked weird among the surrounding buildings." (Participant #15)*

Evidently, this paragraph has provided examples of how the connections with surrounding environment could generate both positive and negative outcomes. Firstly, the violation of congruency among locations will lead to disruption on the local experience for individuals, and in this example, the Starbucks in the classic decoration will look 'weird' for them. Secondly, it is also noticeable that the 'well infused' version of Starbucks has received positive comments, and finally it was shared by the participant. This finding is in line with the results in past studies, a sense of genuine experience in destinations relies on connections between locations (Mak, 2017), and it could facilitate the tourist behaviours like information sharing and purchase.

Clearly, this perspective of consideration is distinct with the aforementioned distinctiveness in physical contexts. Thus, a separation between these two perspectives is essential in understanding individual's perceptions towards places' physical contexts. Correspondingly, as the perspective discussed in this section mainly focus on the connections among locations, the term of connectedness is believed to be a good choice in summarizing the underlined implication. Firstly, in order to distinguish from the concept of distinctiveness in which the physical attributes are different from surroundings, connectedness indicates that the place's physical attributes should be embedded within the surroundings, just like the café mentioned in the example. Besides, the connectedness could also bear the meaning of representativeness of a local sense, which is normally referred as the genuine feeling of culture and custom in the context of location-based information sharing.

5.3 Egoism and Collectivism in Social Contexts

Accompanied by the physical context, the personal and collective relationships with the place are also important factors in driving individual's behaviours, and these connections are even believed to be the core mechanism in transforming a location into a place (Harrison and Dourish, 1996). Therefore, past literatures have paid extensive attention on the social bonding between individuals and locations in the context of environmental psychology (Carrus *et al.*, 2014), tourism (Kang and Namkung, 2016), and information systems (Beldad and Kusumadewi, 2015). Factors like memory, identity, and social norms are identified as important features in building connections toward locations, and their influences are also investigated in the perception formation and behaviour patterns (Evans and Saker, 2017). These studies proposed that, compared with physical attributes, social factors mostly are isolated from the comparison between different places in attributes. Instead, these factors are usually developed through repetitive visiting, memorable moments, and the recognized identity derived from the activities inside the place. For example, the study by Gustafson (2001) found that when the social factor is strong enough, individuals may even ignore the benefits in physical attributes. The residents in an old village will refuse to relocate to a newly built city, just because they are attached to this land that were built by their ancestors. This kind of irrational decision indicates that the perception toward the place should be investigated through both physical and social consideration.

5.3.1 Social Factors

Firstly, in line with these previous findings, similar comments are found from the interviews of participants:

> *"That is a small local restaurant just in my apartment downstairs which located in my hometown, I really like the taste there since I was young. And every time when I came back, I will go there to have a lunch or dinner… That time in that restaurant (when I shared it on social media) I met a childhood friend who I have played with since we are both young, and we have chatted a lot about our memories. At the*

end of that reunion, I decided to share it to tell others that we were having a good time together." (Participant #8)

This paragraph implies that the participant's sharing decision of that local restaurant is driven by the unexpected reunion with the childhood friend. And clearly, the local restaurant plays as a context information, a background material for others to know what has happened behind this sharing. Under this situation, it can be easily told that this place has been regarded as a sign of participant's past experience, and to some extent as a carrier of the participant's identity. From the comments of participants, some words like memory, activities, and familiar are obvious clues for the underlined social factors.

Firstly, the most common social factor toward a place can be developed through the familiarity that was built upon the repetitive interactions and strong memories. Some good examples can be found in participants' comments like:

"You know everyone probably will say that the best local restaurant in town is the one downstairs, and I am also one of them. … Although the taste of that restaurant may not be the best in the whole city, it is still my first choice because my mom always took me there every week when we lived there." (Participant #17)

"Yes, actually there are many other bars there, because it is the city centre, and you can easily find alternatives to have a drink. … However, I will always go directly to that bar whenever possible, not because it has better services or better drinks, but as a habit since I have been there so many times." (Participant #4)

It is evident that in the first paragraph, the local restaurant mentioned by the participant is seen as a proud sign that she could show to others. At the same time, it has also become a linkage between the participant and her hometown, and also a reminder of her past memory with her mother. Besides this kind of strong memory, it could be found from the expression that this special bond also was established through repetitive visiting with her mom. Furthermore, in the second paragraph, when faced with many alternative choices, the participant still

prefers the one that he went frequently in the past, even though he knew that it does not necessarily have the best services. This indicates that the habit, or the repetitive visiting could generate a kind of dependence, and it contributes significantly to the attachment of specific places.

However, although repetitive visiting is present in both above examples, it may not be the only way to build strong social connections with the place. Another pattern of reason found to be related with this social relationship in comments is the single memorable moments that are strong enough for them to keep recalling the experience which happened in that place. Moreover, besides the exact place in which this memory happened, this feeling of social connection could be transferred to other places which share some similar attributes with the original ones. These attributes include similar activities, familiar styles, and information cues that could remind individuals of their past. Examples could be found in participants' comments like:

> *"That [campus] is where I got my first competition award when I still in primary school, then I stuck on this path and became who I am today. ... I never came back to that campus after that competition, but accidently I got this opportunity to visit there, I seized it and shared it on my WeChat Moment." (Participant #6)*

> *"Once I went in [a hometown restaurant] with my friends, I feel a strong sense of familiarity which I had in my hometown. Especially, it reminded me of the old time that me and my friend had long time ago. At that time, we often had lunch together in a restaurant like this one, so I decided to share it to others to show our friendship and how time goes by." (Participant #23)*

Apparently, the past experience and interactions, no matter they are based on frequent visits or unforgettable memories, are critical factors in constructing individual's social attachment to a place. However, behind these patterns, it could also be noticed that these expressions are mostly linked with hints on their identities. Like what is revealed in both comments about the local restaurant

above, although they did not directly mention the word identity in the response, it could be easily inferred that this place has been regarded as a sign of family and friendship, respectively. Moreover, beyond these two signs, they are able to represent a more general concept, which is the self-identity that could be reflected by these particular places (Evans and Saker, 2017). Specifically, in the first paragraph, participant used the local restaurant to tell others that he and his friends has a long time of friendship, and the childhood friend, and a kind of identity, is perfectly presented by this sharing of location. Also, in the second example related to local restaurants, the place is seen as the carrier of identity to its origin (the taste) and its family (the memory with his mother). Nevertheless, besides this identity related to the past, it could also be noticed in the third example that this location-related identity could sustain its continuity from the past to present. Due to the experience that this participant had in that campus, which he believes as the start of his research and competition career, he chose to share it to others to tell how he has started all his life and who he is now. Thus, from this perspective, this place has become a bridge between the past and the present, a piece of information cue that individual could use to represent themselves.

However, apart from the identity consideration, the social factors could also be produced by group or dating activities and emotional effects. The examples could be found in comments like:

> *"That is the first time for me being in that place, but since we did a lot of different activities there, we are really happy and decided to share it all together on our social media." (Participant #21)*

> *"I have known that place for a long time before, but I have never come in because I think it is not my type. But that day I was really excited about the award I received in the previous competition, and me and my friends went to that restaurant to celebrate. During the activity, I found this place is full of surprises and has nothing in common in my imagination, and this feeling drove me to share it." (Participant #9)*

From these two segments, it is obvious that the company by friends and the emotional effects like surprise and excitement are strong drivers of location-based information sharing. Unlike the identity-related expressions which participant mainly used to present themselves, these two examples show that they will also share the place if they are influenced by other peers or focus more on the desire of emotional impulses. In other words, these situations are more related to some kinds of needs that could be satisfied by the sharing behaviour, these needs could be social influences, social norms, emotional releases, and relationship gains. Moreover, although the above illustrated two examples are expressed in a positive manner, the anticipated negative influences of these factors could also be a strong motivation for participants to share the location. One common and typical example can be found in comments from participants:

> *"Actually, for myself, I did not want to share that location. Or should I say, I will not share it if I went there alone. The main reason for that sharing is that I did not want to hurt my friends' feelings, since everyone is so excited about the idea that we should all share it at the same time to others." (Participant #15)*

As shown in this paragraph, the participant shared the place because she did not want to behave like an outsider and ruin everyone's experience. Thus, even she is not a proactive supporter for that sharing idea, she obeyed others and did that sharing as a group activity with others. Some past studies may refer this as the compliance of social norms; however, it is more likely to be a need in relationship maintenance and relationship building under such circumstances. Similar situations have been found in comments from different participants. Some of them said that they shared the location because his or her friend invited or asked them to do it; other reasons include reciprocity and looking for others who were in the same place, etc.

5.3.2 Egoism and Collectivism

Moreover, by looking into all these different types of social factors, a clear distinction is found in terms of the peers. Actually, most of the related comments in social factors are accompanied with some words describing the peers, such as

we, us, together, personal, friends, etc. This pattern indicates that social factors are more or less related to the consideration with others. Furthermore, based on the analysis of co-presence of both identified terms in the peer's category and corresponding social factors, two distinct patterns are extracted in terms of their scope of consideration and the essence of their relationships with the location. In other words, all the social factors found in comments are classified into these two patterns by looking at its type of connections with the participant.

In the first pattern, it is found that participants tend to express their social relationships with the place in a personal manner, and the style of their comments is in line with the egoism behaviours in past studies. Specifically, this pattern includes more terms to describe personal feelings and experiences within the place, and the connection with the place is normally constructed in a personal scope. This means that when participant describe social factors in this place, they are more likely to use their own experiences, identities, and activities alone to form the relationship with it, without a clear consideration with others' influences. Correspondingly, in the second pattern, participants are found to express their connections with the place in a collectivism manner, and their comments are mostly made from the membership perspective in a community or group.

Unlike the egoism pattern, examples in the collectivism pattern include terms related to shared memories, group activities, social influences. The subject in these connections is not simply presented from an individual perspective, instead, it is illustrated from a bigger picture, in the name of a shared experience, but in the form of a member of that collective identity. This could be a circle of friends gathering in a place, a shared memory with others who have the similar experience, or a collective identity that could only existed with people who could understand the same meaning of the place. The distinction between the two patterns could be well demonstrated *by* the following two comments:

> *"I love to share rock-climbing gyms on my social media, because that is my favourite activity and I want others to know it. Therefore, every time when I visited a new rock-*

climbing gym, I will share it to both record it and to tell others I have found a new place to play." (Participant #4)

"One special experience for me in sharing location information is the time when I went to Beijing and visited the Tiananmen Square. It may sound old-fashioned in this era, but I was really excited about it at that time. Probably it is because my parents always told me the story about the history of our nation, so I have this special feeling about the square, even though I have never been there before." (Participant #12)

It is obvious that both of them are talking about the identity when they describe their relationships with the disclosed location. However, it can be seen from them that the referred identities are expressed from different angles. In the former one, although the participant has mentioned others twice in the comments, the core motivation is still within the consideration of herself. The reason of this statement comes from the clue that she sees the rock-climbing as her favourite hobby, and the sharing of related gyms is clearly a good choice for her to present this personal identity to others. This motivation could also be supported by the disclosed record intention of this location, which is a typical egoism behaviour defined in past studies. And for the others-related expressions, it is more like an associate outcome of the core motivation. The way participant framed it makes it look like an aim to expand the influence of the core motivation, which is a clearer illustration of her personal identity as a rock-climber. Nevertheless, things are different in the latter comments. Firstly, it can be inferred that the connection described by the participant is not established directly through repetitive or past visiting, since he has never been to the square before. Instead, this connection is believed to be established through the knowledge and experience transferring from his parents, and also the influence of its citizenship in this nation. In this way, it leads to a shared memory and shared identity which attached to the iconic place, the Tiananmen Square. Thus, from this perspective, this sharing behaviour is clearly out of the consideration of particular others like his parents, and general others as a member of Chinese citizenships. The same

distinction can also be found in other comments, and it is believed to be a core comparison between two streams in the social dimension of locations.

5.4 Conclusion

Based on the content analysis of responses from interviews, this chapter firstly updates the understanding of location-based contexts from the aspects of space, time, and identity. Moreover, through a basic separation of physical and social contexts, four parts are identified along with their representations on social media. The findings of this chapter provide the foundation for the quantitative examinations of factors for the location-based information sharing.

Chapter 6 Data Analysis and Result: Quantitative Study

6.1 Scenario-based Manipulations in the Study

As mentioned in the methodology chapter, the findings from qualitative study will be adopted in the design of scenario-based survey. Based on the identified perspectives in both physical and social context, The 2x2 scenarios combined with both social and physical context were developed to describe each kind of messages related to the location that will be shown to the respondents:

Social contexts:

1) Egoism: the relationship between the location and the respondent will be described as "you went to this restaurant alone at times in the past, and today you also go there alone to have dishes". Besides, the respondents could also see his/her own review on the page in describing the restaurant.
2) Collectivism: the relationship between the location and the respondent will be described as "you went to this restaurant with your friends at times in the past, and today you also go there with them to have dishes". Besides, the respondents could only see his/her own review, but also the reviews from his/her friends on the page in describing the restaurant.

Physical contexts:

1) Distinctiveness: the location is described as "a western restaurant which locates in the downtown centre, the decoration and exterior make it easy recognizable among the surrounding buildings". Besides, the description paragraph and reviews will also strengthen that the restaurant is "high-end", "dedicate", and "special".
2) Connectedness: the location is described as "a local restaurant which locates in the corner of farmer's market, it blends into the surrounding environment so well that only local residents will know this location". Besides, the description paragraph and reviews will also strengthen that the restaurant is "family favoured", "genuine", and "local taste".

The comparison of scenarios for both parts in the MiniProgram is illustrated in Figure 6.1.

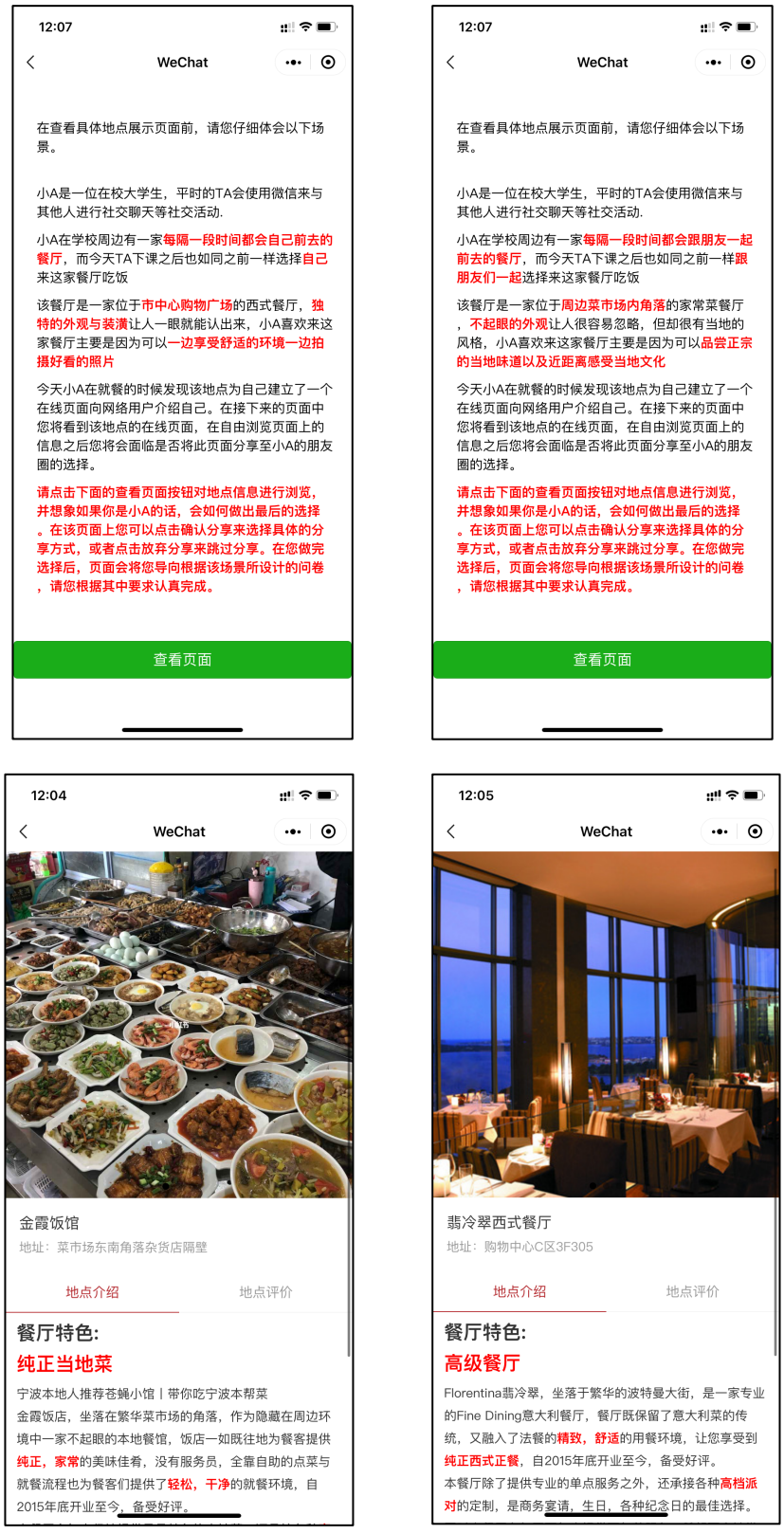

Figure 6.1 Comparison Between Scenarios in the MiniProgram

6.2 Demographic Information and Manipulation Check

Firstly, among a total of 226 responses, 210 of them were usable; the incomplete questionnaires and/or respondents who did not meet the qualifying criterion are excluded from analyses. Among the 210 respondents, 51.9 percent were men and 48.1 percent were women. The average age of the respondents was 29.3, with a standard deviation of 5.8. Further, all of the respondents were highly educated; more than 70 percent of the respondents have a graduate degree. Most respondents had more than 10 years of Internet experience. And the detailed demographic statistics is shown in Table 6.1.

Table 6.1 Demographic Statistics of Survey Respondents

Measures	Items	Frequency	Percentage
Gender	Male	109	51.90%
	Female	101	48.10%
Age	under 20	20	9.52%
	20-25	74	35.24%
	25-30	67	31.90%
	30-35	25	11.90%
	35-40	20	9.52%
	above 40	4	1.90%
Job	Students	120	57.14%
	Employee	53	25.24%
	Unemployed	23	10.95%
	Others	14	6.67%

Since this study has adopted a scenario-based survey methodology, the test of the effectiveness of manipulations is critical for the following analysis. The measurements for the context manipulations are adopted from past studies in the area of environmental psychology, tourism, and consumer behaviours (Wang and Xu, 2015; Gross and Brown, 2006; Dholakia *et al.*, 2004; Barkhuus *et al.*, 2008). Specifically, the t-test is utilized in examining the differences between different groups of participants in terms of their responses. From the perspective of manipulations and scenarios, the distinction between the two directions in both dimensions are tested, and the detailed result is shown in Table 6.2. For the four contexts that were manipulated in the scenarios, it can be seen from the results that all four manipulations are well executed with significant levels < 0.001, and the perception of individuals is thus successfully modified to make them immersed with the assigned scenario.

Table 6.2 Manipulation Check for Contexts in the Scenario Manipulation

Physical dimension manipulations	mean		t	sig.
	Scenario 1	Scenario 2		
Distinctiveness	6.29	3.29	-7.458	0.000
Connectedness	4.12	5.31	4.316	0.000

Social dimension manipulations	mean		t	sig.
	Scenario 1	Scenario 2		
Egoism	4.87	3.05	5.573	0.000
Collectivism	3.03	5.08	-9.057	0.000

6.3 Convergent and Discriminant Validity

Next, the convergent validity and discriminant validity of the constructs in our model were examined. Convergent validity was tested using three criteria of all constructs: (1) the composite reliability (CR) should be at least 0.70 (Raykov, 1997), (2) the average variance extracted (AVE) should be at least 0.50 (Fornell and Larcker, 1981), and (3) all item loadings should be greater than 0.7 (Raykov, 1997). Results of our analysis are shown in Table 6.3. All three conditions of convergent validity were satisfied in our data sample by having the CRs ranging from 0.89 to 0.96, and the AVEs from 0.67 to 0.93. The item loadings were all higher than the 0.707 benchmark.

Table 6.3 Convergent Validity Check for Measurement Items

Constructs and indicators		Loadings	S.E.	T-statistic
Place identity (PI) Cronbach's alpha=0.84; CR=0.91; AVE=0.84	PI1	0.83	0.02	14.13
	PI2	0.85	0.03	10.15
	PI3	0.86	0.02	17.78
	PI4	0.92	0.05	9.56
Place dependence (PD) Cronbach's alpha=0.82; CR=0.89; AVE=0.79	PD1	0.87	0.03	15.35
	PD2	0.87	0.02	20.39
	PD3	0.81	0.03	18.41
	PD4	0.79	0.05	11.27
	PD5	0.89	0.01	37.46
Self-esteem (SE) Cronbach's alpha=0.81; CR=0.92; AVE=0.85	SE1	0.93	0.06	11.14
	SE2	0.89	0.04	13.89
	SE3	0.85	0.02	23.14
Social bonding (SB) Cronbach's alpha=0.81; CR=0.87; AVE=0.82	SB1	0.83	0.03	26.31
	SB2	0.79	0.04	20.89
	SB3	0.81	0.05	15.24
Belongingness (BEL) Cronbach's alpha=0.94; CR=0.94; AVE=0.91	BEL1	0.94	0.03	17.24
	BEL2	0.91	0.02	21.18
	BEL3	0.89	0.05	13.69
Continuity (CONT)	CONT1	0.87	0.01	31.45
	CONT2	0.85	0.03	17.9

Cronbach's alpha=0.87; CR=0.87; AVE=0.79	CONT3	0.86	0.05	11.82
Reputation gain (RG) Cronbach's alpha=0.90; CR=0.90; AVE=0.83	RG1	0.91	0.07	9.65
	RG2	0.90	0.04	13.26
	RG3	0.88	0.03	18.25
Emotional benefit (EB) Cronbach's alpha=0.94; CR=0.96; AVE=0.94	EB1	0.94	0.04	17.34
	EB2	0.95	0.05	13.24
Altruistic benefit (ALTB) Cronbach's alpha=0.84; CR=0.88; AVE=0.84	ALTB1	0.87	0.02	25.53
	ALTB2	0.83	0.03	19.45
	ALTB3	0.89	0.04	11.39
Relationship benefit (RELB) Cronbach's alpha=0.88; CR=0.86; AVE=0.78	RELB1	0.85	0.02	23.31
	RELB2	0.89	0.04	15.87
	RELB3	0.83	0.01	34.51
	RELB4	0.84	0.03	19.27
	RELB5	0.86	0.04	16.11

Discriminant validity is indicated by low correlations between the measure of interest and the measure of other constructs (Fornell and Larcker, 1981). This validity can be assessed by having the square root of the average variance extracted (AVE) of each construct higher than the correlations between it and all other constructs. As shown in Table 6.4, the square root of the AVE of each construct is located on the diagonal of the table and is in bold. A reasonable degree of discriminant validity obtains since each of them is greater than the correlations between it and all other constructs.

Table 6.4 Discriminant Validity Check for Constructs

	Mean	Std.	PI	PD	SE	SB	BEL	CONT	RG	EB	ALTB	RELB
PI	4.36	1.36	0.917									
PD	5.02	1.89	0.334	0.889								
SE	4.78	1.04	0.632	0.366	0.922							
SB	4.31	1.56	0.534	0.298	0.367	0.906						
BEL	3.96	0.96	0.522	0.246	0.436	0.437	0.954					
CONT	3.78	0.84	0.611	0.309	0.399	0.391	0.379	0.889				
RG	5.23	1.88	0.321	0.547	0.128	0.231	0.134	0.183	0.911			
EB	4.31	0.79	0.367	0.489	0.236	0.359	0.257	0.223	0.478	0.97		
ALTB	4.12	0.72	0.231	0.621	0.209	0.264	0.269	0.267	0.529	0.389	0.917	
RELB	5.23	1.35	0.398	0.594	0.179	0.197	0.198	0.245	0.375	0.462	0.598	0.883

6.4 Structural Model and Hypotheses Testing

As for the structural model testing, in order to provide insights from different levels of analysis, this study will firstly test the coefficients of paths in the research framework based on the whole dataset that collected from four scenarios. Then, the model will be further tested based on contrasting scenarios (i.e., egoism vs. collectivism in social dimension, and distinctiveness vs. connectedness in physical dimension) to examine the proposed hypotheses. Lastly, the data collected in four distinct scenarios will be used separately to test the relationships within the model.

As shown in Table 6.4, the structural model analyses are assessed based on the test of the hypothesized effects in the research model. Figures 6.2 and 6.3 present the results of the hypothesized structural model test for different models, including estimated path coefficients with significant paths indicated by asterisks, and associated t-values of the paths. Bootstrap resampling procedure was used to perform the significant testing for each path. An examination of the R-square value demonstrates that the model explains a substantial amount of the variance in the outcome variable. In our model, it explains 69% of the variance in individual's location-based information sharing intention.

Table 6.5 Hypotheses Test Results on the General Dataset

Hypothesis		Path coefficient	t-value	Result
H1	PI → SHARE	0.599***	6.03	Supported
H2	PD → SHARE	0.315***	3.77	Supported
H3a	PC*PI → SHARE	-0.071	-0.55	Not Supported
H3b	PC*PD → SHARE	-0.163**	-1.32	Supported
H4	SB → PI	0.173**	2.34	Supported
H5	SE → PI	1.359***	8.53	Supported
H6	CONT → PI	0.186**	2.87	Supported
H7	BEL → PI	0.142*	2.03	Supported
H8	RG → PD	0.239**	2.76	Supported
H9	RELB → PD	0.539***	5.89	Supported
H10	EB → PD	0.046	0.37	Not supported
H11	ALTB → PD	0.214**	2.78	Supported

It can be seen from the Table 6.4 that the path coefficients in the structural model computed using the entire dataset showed that all the hypotheses were supported except H10. Two routes in the dual-process model can positively influence the final sharing behaviour of location-based information as proposed, supporting

H1 and H2. For the moderation effect of privacy concern on both routes, the relationship between the place dependence and sharing behaviour is negatively moderated by privacy concerns, which supports the H3b. However, the moderation effect of privacy concern on the relationship between place identity and sharing behaviour is not significant, which rejects the H3a.

6.5 Scenario-based Analysis of Structural Model

Besides, when compare models based on two manipulated datasets separated by the social dimension of location, clear contrasts could be identified in the paths to both routes in the dual-process model. Firstly, in both egoism-manipulated and collectivism-manipulated scenarios, the self-esteem and the belongingness can significantly influence the place identity. Specifically, in two corresponding models, the continuity can positively affect the place identity in the egoism-manipulated scenario, while the social bonding can positively influence the place identity in the collectivism scenario. As for paths to the place dependence, the relationship benefit is the only item that can both significantly influence the place dependence in two models. In the egoism-manipulated scenario, the reputation gain adds as a new driving force to the place dependence. Meanwhile, in the collectivism scenario, the emotional benefits and reciprocal benefits jointly contribute to the formation of place dependence.

Moreover, for the effects of two processing systems on the sharing behaviour, no particular difference is found between two models. Although both the place identity and dependence could positively predict the sharing behaviour of location-based information, the moderation effect of privacy concern varies between these two models in its impact on place dependence. When scenario is collectivism-manipulated, the negative moderation effect of privacy concern is mitigated and become insignificant compared to the one in egoism-manipulated scenarios.

Correspondingly, the comparison between models split by physical dimension also indicates some insights in the diversity of relationship between constructs. Start from the paths to two routes in the dual-process model, the self-esteem remains as the only item that can significantly contribute to the place identity in both scenarios. As complements, the continuity can conjointly influence the

place identity in distinctiveness-manipulated scenarios, while the belongingness and social bonding will affect the place identity together in connectedness-manipulated scenarios. As for the place dependence, the relationship benefits and reputation gains are the ones that could affect the place dependence consistently. Regarding the two types of scenarios in physical dimension, the reciprocal benefit is added as another significant antecedent to the place dependence in distinctiveness-manipulated scenarios. Meanwhile, the emotional benefit comes in as an additional factor in contributing to the place dependence under connectedness-manipulated scenarios.

Furthermore, relationships between two routes in the dual-process model and the sharing behaviour show great differences with the ones in previous models. It is clearly that the place identity has no significant effect to the sharing behaviour under distinctiveness-manipulated scenarios, and the moderation effect of privacy concern also significantly decrease the effect of place dependence on the sharing behaviour. Correspondingly, similar to the situation of models in social dimension, both place identity and place dependence positively related to the sharing behaviour, and the privacy concern only negatively moderated the influence of place dependence on sharing behaviours.

6.6 Conclusion

This chapter presents the quantitative study by firstly introducing the exact contexts constructed for the scenario-based survey. And after the check for the manipulation effectiveness and factors' validity, the influences among constructs in the research framework are examined. The result shows that place attachments could significantly influence the location-based information sharing behaviour from a dual-process perspective. Furthermore, with the analysis of results obtained from four contexts, the influences of factors reflect a dynamic nature under different contexts.

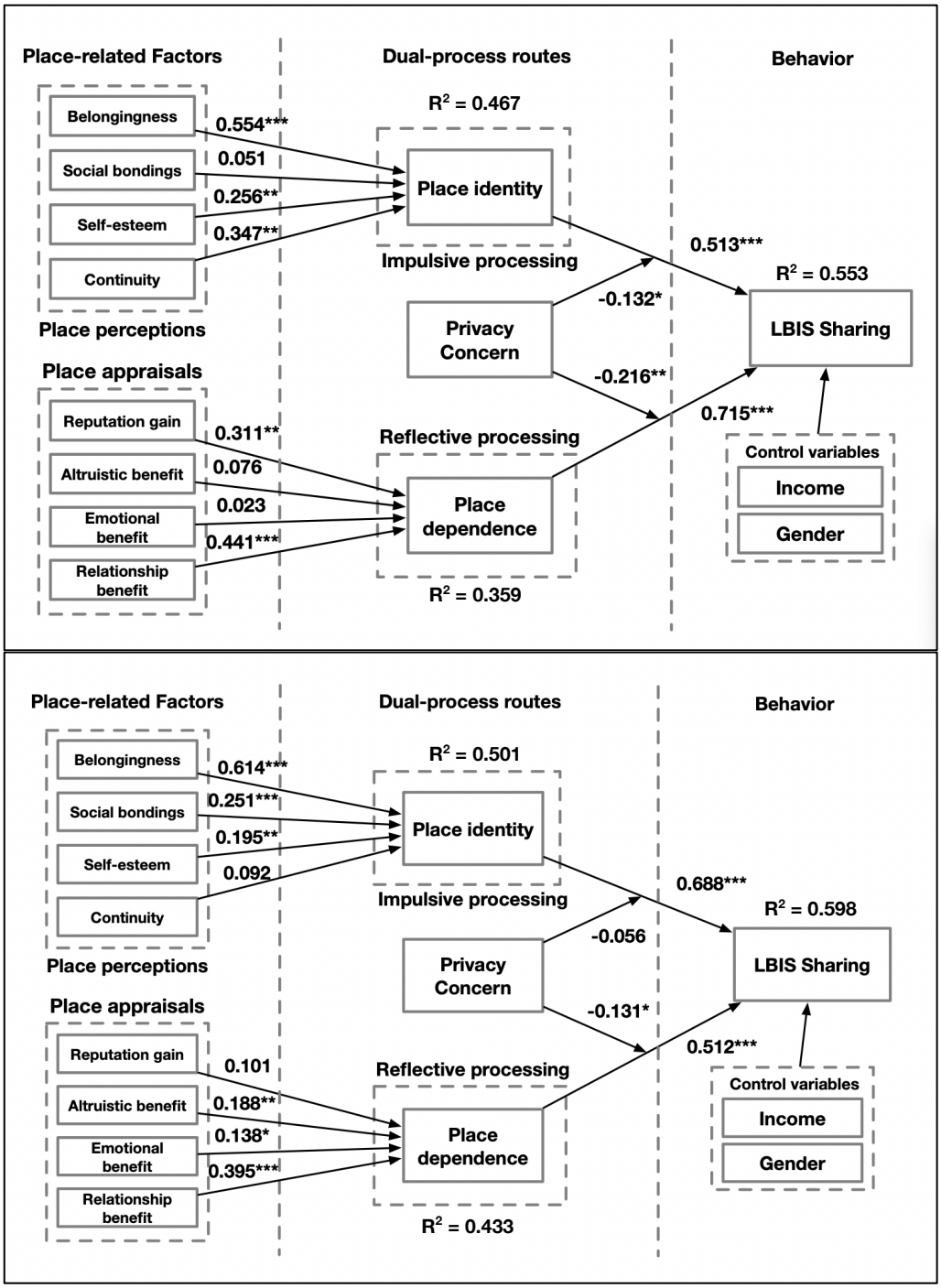

Figure 6.2 Path Coefficients Results on Social Contexts
(Egoism on the top vs. Collectivism on the bottom)

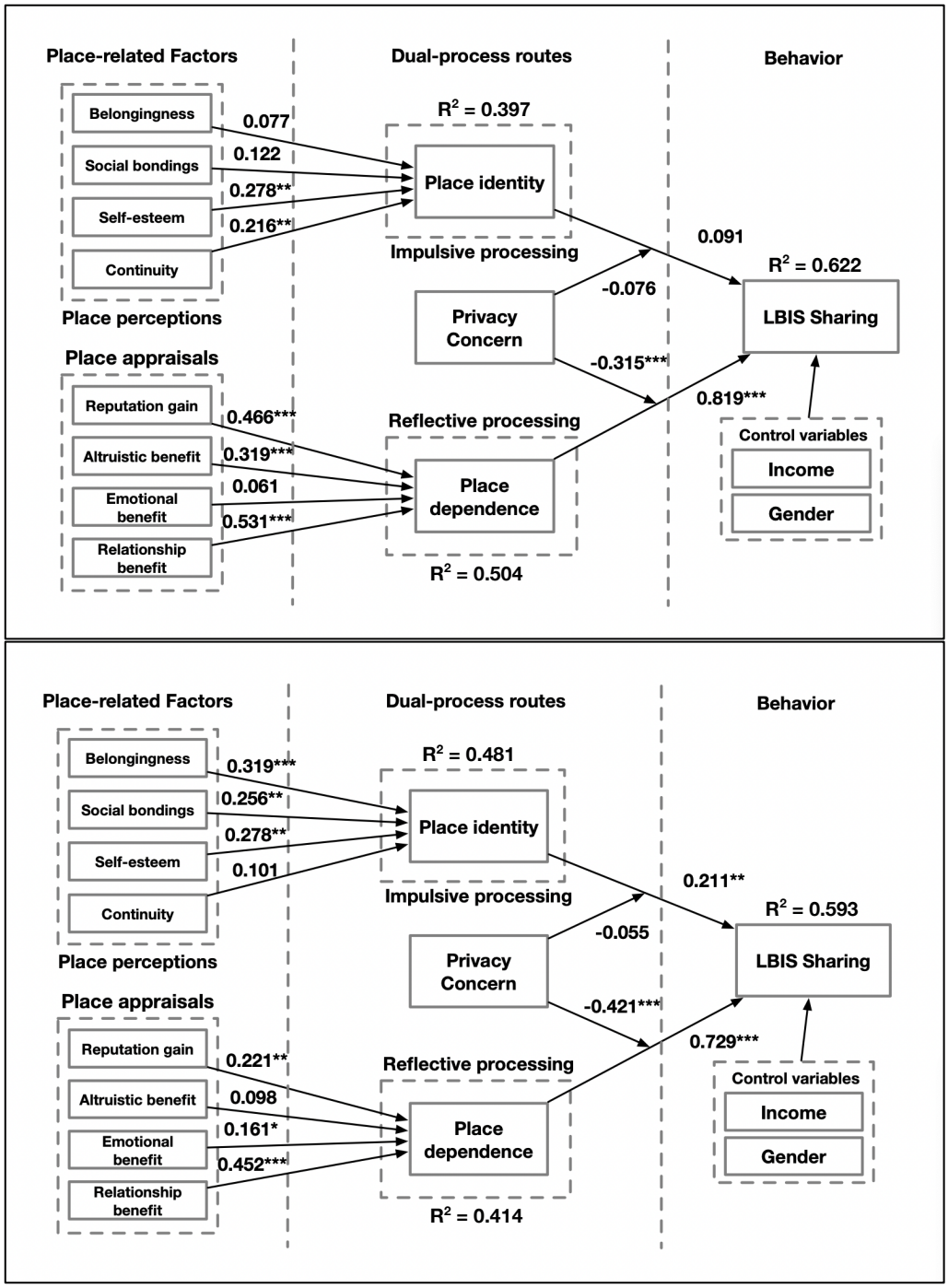

Figure 6.3 Path Coefficients Results on Physical Contexts (i.e., Distinctiveness on the top vs. Connectedness on the bottom)

Chapter 7 Conclusions and Discussions

Given the limited focuses in context during the sharing of location-based information (Lamsfus *et al.*, 2015), this study seeks to explore the factors that constitute the contexts and examine their influences in the location-based information processing of individuals. This chapter will discuss the results of both qualitative and quantitative studies, and the connection between the two parts. In addition, it will also address the limitations of the study, and highlights the contributions to research and practice.

7.1 Location-based Contexts

This thesis qualitatively investigated individuals' perceptions toward location under various contexts of location-based information. The results reveal that personal relationships, physical features, and social-oriented considerations could influence individuals' cognitive representations of the environment in terms of both physical and social contexts.

Firstly, the use of social media and associated location-based information actively changes the context. Specifically, on the one hand, the social media and location-based information turns the physical world into a multi-dimensional context by recognising individuals past movements, social connections, identities, and these clues constructed the foundation of contexts. On the other hand, the location-based information extends the social scope by enabling ubiquitous connections with a variety of location-based contexts, and create new social norms and information patterns on social media. As a result of the interactions between human factors, timing, and personal identities, location-based information has been enriched with added contexts originated from various combinations of related factors.

Location-based information, thus, could provide affordances for social circumstances, personal images, and communication channels with established contexts. Rather than just providing introductions and location awareness as discussed in previous research (Li and Chen, 2010), this study found location-based information with contexts is active in adjusting the decision-making processes by expanding and changing perceptions, drawing attention to specific

context elements, triggering decision processes, facilitating decision-making, and guiding decision implementation.

This study echoes previous studies suggesting that individual decision-making in location-based information sharing is highly dependent on contexts, and that the interplay between location-related perceptions and contextual factors can lead to substantial biases in information processing and sharing behaviours (Gay, 2009; Zhu *et al.*, 2010; Lamsfus *et al.*, 2015). Previous studies have noticed the impact of elements in the external environment of the location on individuals' perceptions and behaviours (Lamsfus *et al.*, 2015). Clitheroe Jr *et al.* (1998) suggested that the contextual sources like Internet could both support and initiate psychological and behavioural processes, the social media thus also follows this mechanism in affecting individuals. The findings of this study confirms that the affordances provided on social media in embodying the physical and social context is not just a tool to explore the context but actively shapes it. Specifically, they jointly create a context that invites individuals to interact with peers, deliver messages, and present images by providing relevant, real-time physical and social cues.

Specifically, for the physical context in location-based information, this study has explored the influence of social media in shaping the physical perceptions toward the location. As stated in affordance theory (Pozzi *et al.*, 2014), the perception-action process always involves a discussion of context, since the perception are directly obtained, and the associated action is bonded with temporal and spatial factors. Following this way of thinking, the physical context needs to be analysed under the consideration of how it could afford the actions and perceptions on social media. Actually, this study found that, unlike the analysis framework for offline location perceptions, which focus heavily on structures and intersections of physical elements in a location, the physical context of location-based information on social media requires additional attentions on the social-oriented affordances of physical features. This has transformed the ways of how people perceive and expresses a location. Individual used to describe a location's physical context by using positions and relative distances to other locations (Koeppel, 2000); but now, they tend to adopt a similar comparative perspective with more social-oriented lens to highlight the

social value or function it affords. Terms like ‘good for selfies’ and ‘instagrammable’ are examples of how social media shapes the perception toward a location with established knowledge through social interactions. Next, a distinction between the two perspectives in physical context is also identified. The distinctiveness perspective highlights the uniqueness and difference of a location among its surroundings, which is usually linked with values in eye catching, identification, and sense-making. Correspondingly, the connectedness perspective emphasizes on the connections among locations in forming a unified sense of place, and provides values in genuine experiences and congruences.

Then, for the social context in location-based information, various social factors have been explored for their effects in manipulating individuals’ perceptions to the social-cultural aspect of location. The concept involved in this perspective are believed closely related to the place meaning in past studies (Kyle *et al.*, 2004; Frith, 2014). Place meanings are treated as a social practice that cannot be understood outside of interactional, cultural, and institutional contexts in which they emerge. Thus, such meanings are extremely useful and important in marking personal social boundaries and personal identity through location-based information in forms of hobby, frequent activities, and quality of locations. The findings in qualitative study confirms that the social context consists of several factors that are socially or symbolically constructed within the personal, cultural, and historical contexts. This finding is consistent with the statement in past studies about the emergence of social-cultural meaning within a place (Gustafson, 2001). Moreover, the identity of individuals could be supported and initiated through this meaning and special bonding toward the social context of location. Location-based information on social media is a useful tool for individuals to manage identities and impressions online, and they will be attracted and attached to locations with symbolic meaning that are congruent with their desired identities. Also, Lynch (1960) claimed that the inherent meaning of location can transcend cultures and nations, and it could reflect the essence of how a place is perceived by individuals through properties. Similarly, on social media, the social context in location-based information could also be shifted among locations, as long as they possess similar properties in reflecting particular identities of the individual.

Then, a separation of two perspectives in the social context is also identified to frame the distinction based on the level of social considerations. The egoism perspective aims to capture the individual-level related identities, memories, and relationships, and it is believed to strongly influence activities that are tightly connected with the personal image, belief, and benefit. Likewise, the collectivism perspective of social context thus takes a similar lens on the collectively built factors, to explain how individuals are affected by the community they belong to or identify with. Accordingly, the motivation within the collectivism perspective will be derived mostly from the level of shared identity, objective, and benefit. Aside from the motivations, another major difference between these two perspectives is the originality of their formations. Although both perspectives could be developed through past interactions with the location, as expressed in Schwartz and Halegoua (2015) that whether people attached with locations individually or collectively will influence their mindsets, the collectivism perspective could be indirectly learned and obtained through visual, verbal, and textual materials.

Based on the investigation of individual's location-based information sharing in light of behavioural patterns, physical and social contexts exert substantial influences on the information processing mindsets and sequences. This study finds that contexts can modify the arrangement of focus on decision-making process by activating affective and cognitive attentions on information about physical and social contexts. Consequently, it could induce changes in the sequence of the planned activities in location-based information sharing or the time for executing the planned sharing, as well as affecting the final choice among several alternative options in the disclosure of contents. Moreover, both social and physical contexts seem to play a significant role in recognising locations as a presentation of individuals (Saker, 2017), and sharing decisions regarding time, space, and identity aspects (Evans and Saker, 2017). Besides, the privacy-related concerns imposed by role conflicts, social norms, and multiple identities are also critical factors in affecting individuals' sharing decision, including the postponement and cancellation of the intended or planned sharing. Thus, location-based contexts use can exert a strong influence

on the socio-temporal patterns of location-based information within certain locations.

This study contributes to the discussion on the contextual factors related to location-based information sharing. Previous research has indicated that situational factors will bias the decision-making process with various places, times, and peers, which in turn increase the dependence of activities on on-site experience which an individual perceives at certain locations (Carter, 2013; Yao *et al.*, 2018). Additionally, social media and digitalized location-based information seems to strengthen this effect by making physical and social contexts explicit and by enabling decision-making with considerations from 'performative' perspectives (Larsen, 2010). The mobility, then, seems to further encourage the 'fragmentation' (Couclelis, 2009) of the decision-making process; that is, the decision-making process is driven by several separated pieces of contexts constructed with time, locations, and interpersonal relationships. The physically, and more importantly, socially constructed meanings of locations enable individuals to activate, process, and complete the decision-making at different stages of information processing, thus leading to various patterns of behavioural schema and potential interruptions of planned behaviours. This study's findings reflect the past findings on contexts related to locations and location-based information, moreover, providing in-depth insights into the forms and structures in which context occurs on the social media environment.

7.2 Location-based Information Processing and Contexts

Next, based on the dual-process model and place attachment theory, this study develops and validates the dynamics of location-based information sharing under various contexts identified in the qualitative study.

7.2.1 Place Attachments from the Dual-process Perspective

To begin with, the general result of structural model testing on the whole dataset supports the proposition that two types of place attachment, place identity and place dependence, could both drive the sharing behaviour of location-based information. This is in agreement with the main findings in past studies about place attachment (Ujang and Zakariya, 2015; Scannell and Gifford, 2017b; Dwyer *et al.*, 2019), which claimed both the identity represented by the location

and the functional benefits provided by the location could significantly predict the individual's behaviour. The result presented in this study has confirmed such relationships within the scope of location-based information sharing behaviour, and both effects of place identity and place dependence could influence the individual's behaviour simultaneously from a dual-process perspective.

Firstly, since the dual-process theory has been used extensively to explore and examine the intersections between directly perceived and carefully considered factors with corresponding slow and fast forms of cognition (Evans and Frankish, 2009; Evans, 2010, 2018), its definitions for two systems of processing could be well adapted to the two types of place attachment. In the first system of processing, autonomous/impulsive cognition is grounded in perception and intuition - thinking is fast, automatic, effortless, and associative, and it generates impressions of the attributes of objects with abstract concepts and symbolic meanings (Evans, 2018). This type of processing matches with the formation of place identity proposed in past studies (Lalli, 1992; Gu and Ryan, 2008; Schwartz and Halegoua, 2015) that it summarizes the symbolized and identity-related perceptions related to personal concepts (Proshansky *et al.*, 1983). Also, it is generally accepted that this processing represents a set of modes of cognition associated with rapid autonomous and impulsive processes that yield habitual or established responses from developed behavioural patterns (Evans, 2010). Next, in the second system, which is grounded in reasoning, thinking is slow, serial, controlled, effortful, and rule-governed (Evans, 2018), which is involved in judgments, irrespective of whether they originate in impressions or in deliberative reasoning (Gilovich *et al.*, 2002). Hence, this statement matches with the definition of place dependence proposed in relation with the social media environment (Sun *et al.*, 2015; Scannell and Gifford, 2017a), as the consideration of whether to share location-based information is based on systematic reasoning on the outcome associated with the activity. In contrast with the impulsive processing, this style of processing involves more reasoning processes (Evans, 2010), and the behaviour influenced by this processing will include deliberate thinking on benefits and risks. The result from model testing confirms the validity this framework, and verifies that both place identity and place dependence could influence the location-based information sharing

simultaneously. However, as proposed in past dual-process studies that within each type of processing, there are modes of cognitive processing styles or thinking dispositions which can vary continuously according to personal differences and situational factors (Evans and Stanovich, 2013), the effects of place identity and place dependence thus need to be testes and discussed among various contexts.

Specifically, among various location-based contexts, the place identity and place dependence could significantly affect individual's behaviour consistently, with the exception of distinctiveness perspective in the physical context. As the context which emphasizes on the location's uniqueness and differences among surroundings, the place identity shows no significant relationship with the sharing behaviour under such context, while the place dependence remains a strong predictor. This anomaly indicates the allocation of weightings between two types of place attachment varies under different location-based contexts, which matches with the proposition in Di Masso *et al.* (2019) that place identity and place dependence follows different routes in affecting individuals' perceptions, and the activation of according type is contingent on the context at the moment. Specifically, for locations with high values from the distinctiveness perspective, individuals tend to focus solely on the consideration of place dependence, which may be caused by the high utility and low identification of this kind of location. As proposed in Lalli (1992) that place identity, especially in the urban environment, will be highly associated with and triggers high possibility of related behaviours with locations that are consistent with the overall 'scent' of the city or surroundings. On the contrary, the location that designed with conspicuous features are believed to highlight certain advantages purposely (Apaolaza *et al.*, 2021), with an aim in providing symbolic and functional benefits for individuals. Although past studies have found such location is suitable for the identity presentation of individuals, it is hardly seen as a part of self-concept, but a tool to illustrate the desired identity effectively (Schwartz and Halegoua, 2015). Hence, it is nature for individuals to ignore the place identity and rely heavily on the place dependence in decision-making process under such context. In aggregate, the distinctiveness perspective in location-based contexts has featured a special circumstance that individuals will

attach imbalanced importance on place dependence in making sharing decisions, and this also reflects the essence of dual-process model of information processing.

In accord with past findings in tourism and environmental psychology research (Kang and Namkung, 2016; Kim and Fesenmaier, 2017; Wisniewski *et al.*, 2020; Lim *et al.*, 2021), individuals, especially tourists, normally have detailed pre-trip plans before the visiting to destinations. The formation of these plans will be determined by a systematic consideration over expected experience, emotional dependence, and tangible and intangible gain related to the visiting (Saker, 2017). This is also the case found in this study, when individuals plan to visit a location, they will mostly develop an overall impression of the location, and also potential activities that afforded by the location. Especially, from the distinctiveness perspective in location-based contexts, individuals will express a high propensity in sharing the location prior to the actual visiting in interviews, in exchange for attentions and popularities from the social network. This is also a possible explanation for the ineffectiveness of place identity in the exception scenario, since the sharing decision is made beforehand, and the impulsive system will not be engaged regardless of whether place identity is activated. This could be explained with a dual-process perspective that, although the place identity and place dependence can influence the sharing behaviour simultaneously, the sequence or stop criterion of the processing will be altered based on the contextual factors (Novak and Hoffman, 2008). Alternatively, this could also be explained by the extremely imbalance weighting allocation on two processing systems due to the consideration under certain contexts (Pennycook, 2017), while may lead to the vanishment of place identity in affecting individual's behaviour.

7.2.2 Privacy Concern from A Dual-process Perspective

Moreover, since the privacy has been regarded as a core perceived risk (Xu *et al.*, 2011; Wilson and Valacich, 2012; Okazaki *et al.*, 2012; Kelley *et al.*, 2013) and important factor in forcing individuals to carefully think about their sharing behaviour of location-based information (Xu *et al.*, 2011; Wilson and Valacich, 2012; Okazaki *et al.*, 2012), its effects in adjusting the two processing systems are discussed with the moderation test of privacy concern on two processing

routes. The result indicates that the privacy concern could only restrict the force imposed by place dependence on the sharing behaviour, but could not influence the effect of place identity on individual's final behaviour. Although this result has rejected the hypothesis that privacy should moderate both the effect of place identity and place dependence on the sharing behaviour, it still supports that the privacy concern will impose more influences on place dependence than place identity, and opens further discussions for the role of privacy concern in the dual-process model.

Specifically, the insignificant moderation effect of privacy concern on the relationship between place identity and sharing behaviour could be a possible explanation for the past findings related to the phenomenon of privacy paradox (Norberg *et al.*, 2007; Wilson and Valacich, 2012; Taddicken, 2014). As expressed in these studies, the privacy paradox describes the phenomenon that individuals will expressed inconsistent perceptions of privacy concerns and behaviour intentions (Taddicken, 2014). The challenge in solving this problem is not only about explaining the paradox itself, but also to resolve conflicts between past studies of which the results can both support and reject this paradox (Knijnenburg *et al.*, 2017). Thus, the result obtained in this study could be a starting point for the analysis of this challenge.

Firstly, as the privacy concern is found capable in negatively moderating the effect of place dependence on the sharing behaviour, it somewhat confirms with past findings in supporting the privacy's negative influences on the associated behaviour (Wilson and Valacich, 2012; Krasnova *et al.*, 2012). The place dependence is designed to capture the utility functionality of location for the individual, which primarily consists of benefits and rewards individuals expect from the associated behaviour. Therefore, when such processing system is activated, the systematic processing with deliberate reasoning will change the consideration of sharing problem into the traditional privacy calculus model (Dinev and Hart, 2006). And when this type of system dominates the decision-making process, then the behaviour of individuals will be solely driven by a similar mechanism in privacy calculus model. Despite the similarity between these two model, the privacy calculus model mostly adopts privacy concern as a peer of and direct reduce to benefits which directly link to the final sharing

behaviour (Tsai *et al.*, 2010), while the dual-process model in this study uses it as the moderator of the place dependence. This change has advanced the discussion of privacy-related behaviour model into the scope of dual-process perspective. Firstly, privacy calculus model have long been criticized for its simplicity in explaining the individual behaviours (Knijnenburg *et al.*, 2017), and the validity of the framework is also severely limited by the biased factors during the decision-making process. Thus, recent studies call for a re-examination for the role of privacy concern in the cognitive processing of information, and many studies have tested the moderation effect of privacy concern on sharing behaviours (Tan *et al.*, 2012; Koohikamali *et al.*, 2015). Besides, past studies about place attachment have also noticed that location-based behaviour is based on non-linear, complex dynamics, and cannot be fully understood using traditional linear cause and effect models (Bonaiuto *et al.*, 2016). Thus, the examination of moderation effect of privacy concern on location-based information have well suited the nature of place attachment theory, and also extends the perspectives for the investigation on privacy calculus model.

In addition, the other part of the challenge proposed for the privacy paradox is the formation of such irrational behaviour (Taddicken, 2014). Past studies proposed that the privacy paradox may be produced by the unnoticed ignorance on the impulsive processing of the information (Li *et al.*, 2010; Okazaki *et al.*, 2012). Due to the limitation of methods adopted in past studies, such as recalled experience and post-behaviour surveys, in collecting individuals' perceptions during the information sharing, it is hard to capture the subconscious perceptions that derived from directly perceived factors at the moment (Pagani and Malacarne, 2017). Thus, due the lack of measurements for these immediate perceptions, the findings on the negative relationship between privacy concern and sharing behaviour could be falsely attributed to the evaluative factors that used intensively in models like privacy calculus. In such a way, the finding of this study about the ineffectiveness of privacy concern in moderating the influence of place identity on sharing behaviour may be a good complement to analyse such phenomenon. The method adopted in this study has facilitated an environment with 'realism' of actual location-based information sharing, thus,

the corresponding measurements for immediate perceptions for location could be captured instantly and properly. Then, based on the analysis of this data, the insignificant moderation effect of privacy concern could provide valuable insights for the originality of the privacy paradox. From a dual-process perspective, the impulsive processing system is proposed to function in an autonomous way, through which a link between perceptions and behaviours will be activated directly with established behaviour patterns (Evans, 2018). So, the finding of this study matches with this statement that place identity, as the proxy of impulsive processing system in location-based information sharing, may bypass the consideration of privacy concern, and lead to a final behaviour directly. Through this way, the moderation effect of privacy concern will appear to be insignificant. Or in other words, the privacy concern will fail to weaken the sharing behaviour and lead to the emergence of privacy paradox, if the impulsive system is engaged and utilized in directly getting a decision in the information processing.

Furthermore, from the dual-process model itself, the role of privacy concern is also examined for its effect in adjusting the balance between the two processing systems. Past studies about dual-process models have argued that the balance, structure, or sequence of two systems will be adjusted substantially by the motivation to engage corresponding processing systems (Evans and Stanovich, 2013; Evans, 2018). The privacy concern, then, comes in as a good element in manipulating the two systems. For the reason that privacy concern has been centred in past literature (Dinev and Hart, 2006; Tsai *et al.*, 2010; Hugl, 2011; Wang *et al.*, 2011), the considerable effect it has on the information sharing behaviour will force (i.e., provide strong motivations) individuals to think carefully about their behaviours. Based on the result in this study, with the increase of privacy concern, the influence of place dependence will be eventually diminished, and will lead to a classical privacy paradox situation where the sharing behaviour is completely driven by place identity - the impulsive processing system. Also, this is supported by similar findings in past studies that people often express regrets after the sharing of certain locations, which they may find inappropriate afterwards (Wang *et al.*, 2011; Patil *et al.*, 2012). This could be explained by the mindless of privacy during the sharing

under high impulsiveness and low reflectiveness context, so people will only realize this problem after the sharing completed, and regret for that.

Yet, despite the fact that privacy concern fails to significantly moderate the effect of impulsive processing in the general model, the testing on various contexts surprisingly reveals that this effect becomes significant in the egoism perspective of context. This abnormal finding may be attributed to the nature of this context, the egoism perspective of context stresses on the individually constructed linkage to the location, which may consist of person's past, values, and private information. Hence, one possible explanation for this salient effect could be that past privacy-related activities have influenced the established behavioural patterns within the similar context, in which way the privacy concern is activated together with the perception of place identity. Jointly, it shows a moderation effect on the influence of place identity on the sharing behaviour. As well, another potential explanation lies in the possible overlap between the contributing factors of place identity and place dependence. Past studies have explored the measurements and structures of place attachment extensively with various propositions (Morgan, 2010; Raymond *et al.*, 2010; Manzo and Devine-Wright, 2013). And based on these findings, the result under the egoism perspective of context could be assumed in two ways: 1) the place identity may involve some additional dimensions that processed in a reflective way, or 2) some of elements in the formation of place identity triggers the evaluative process.

7.2.3 Place Perceptions under Various Contexts

Additionally, in terms of the relationship between place-related features and place attachments, this study also examines the influence of factors on place identity and place dependence, respectively. Firstly, the result presents that all factors in place perceptions are significantly related to the place identity. This finding generally confirms the relationships proposed in the study, and supports that belongingness, social bonding, self-esteem, and continuity are identifiable factors that positively predict the place identity in location-based information sharing.

Still, as dual-process model proposed that modes of cognitive processing styles or thinking dispositions would be varied continuously according to situational factors (Evans and Stanovich, 2013), this variation is also reflected in the composition of place identity among various contexts. Based on the result obtained from separated contexts, it could be found there is no single context within which all four proposed factors are significantly related to the place identity; and each of four factors has been found as a valid contributor of place identity at least once among these contexts.

For the belongingness, which aims to measure the sense of belonging to the community or group represented by the location (Evans and Saker, 2017; Hogg, 2020), its relationship with the place identity has been validated among most contexts, except for the context of distinctiveness perspective. The reason for this exception could be attributed to the discrepancy between the perceived identity and sense of belonging for locations with high distinctiveness. Generally speaking, with external and/or conspicuous features, this type of location is normally a good choice in presenting the personal identity (Schwartz and Halegoua, 2015). But, the place identity constructed in this way will be highly dependent on the functionality or advantage afforded by these features (Schwartz and Halegoua, 2015), and the formation of place identity under this context will not necessarily require the feeling of individuals in belonging to the community related to this location. Among other contexts examined in the study, the belongingness shows consistent relationships with the place identity, which means that the belongingness could generally predict the place identity in most cases.

Next, the social bonding is found as a reliable element in place identity under the connectedness and collectivism perspective of context, but fails to predict place identity in the distinctiveness and egoism ones. Clearly, a boundary could be easily identified between the four contexts in this result, with a relation to the concept beyond individuals. Firstly, both the connectedness and collectivism perspective emphasize the aspect of locations on the physical and social relationships with others from a bigger picture. And with the support from past scholars that individuals will see locations that shared with other social connections as a commonly owned property, they will also develop a strong

inclination to regard this location as an extension of personal identity that constructed collectively (Stets and Biga, 2003). Thus, with a higher sense of social bonding, individuals will feel more socially connected with the particular place (Sun *et al.*, 2015; Papangelis *et al.*, 2020). And a strong sense of place identity will be developed, if the location could be well embedded within the overall picture of identity-related surroundings, like in the connectedness perspective; or the relationship with location is built collectively through community-based identity, like in the collectivism perspective. Secondly, on the contrary, it is hard to for the sense of social bonding to function in the distinctiveness and egoism perspectives, because the formation of place identity in these contexts seems more diverse and free from the effect of social bonding (Twigger-Ross *et al.*, 2003; Stets and Biga, 2003).

Then, the self-esteem appears to be a solid predictor of place identity no matter what the context that individuals are faced with. This is conforming to the past findings in supporting self-esteem as a foundation of self-identity in location-based studies (Wang and Xu, 2015). Defined as individuals' overall subjective evaluation of themselves with the relation to certain places (Ysseldyk *et al.*, 2016), its effects in contributing to the place identity is verified in this study. The generalizability of this factor in predicting place identity under various contexts may come from the rich sources of the self-esteem related to locations. Past studies have found that location-based self-esteem could be obtained from religious beliefs (Ysseldyk *et al.*, 2016), personal advantages (Wang and Xu, 2015), group-based activities (Barkhuus *et al.*, 2008), and even show offs (Wang and Stefanone, 2013). Hence, these studies provide reasonable explanations for the reliability of self-esteem in predicting place identity.

Lastly and interestingly, the continuity is also found to significantly increase the place identity in two contexts – i.e., distinctiveness and egoism perspectives, which in contrast with the situation for the social bonding. As a factor which emphasizes the preservation and record of personal growth, the continuity is important in keeping individuals in mind about who they are in the past and how they become themselves at the present (Ujang, 2012; Wang and Xu, 2015). Apparently, with the conspicuous features, the location within the distinctiveness perspective will be easier for individuals to both show the

identity-related concepts (Fried, 2000) and to remember what they have done in that place (Ujang, 2012), thus facilitate the influence of continuity in the construction of place identity. Also, because the location that takes the egoism perspective is tightly related to people from the individual level, it forms a geography map of individual's past movements and activities, which could be utilized by individuals as an extension of self to display to others (Wang, 2013; Hsieh *et al.*, 2014). These footprints could be a wonderful presentation for users on social media to show how they moved from one city to another, or where they have been to for certain activities (Hsieh *et al.*, 2014). Contrarily, from the collectivism perspective, locations in this context normally describe the story from a broader scope, by which makes it hard for individuals to mark their own identity, since it is quite stable and shared by a number of people together (Hochschild Jr, 2010).

7.2.4 Place Appraisals under Various Contexts

Correspondingly, this study also explores connections between place appraisals and place dependence under various contexts. Similar to the situation of factors related to place identity, the effects of items connected with place dependence also are varied by the influence of contexts. The measurements that aim to capture the expected outcome of location-based information sharing behaviour, including the reputation gain, relationship benefit, emotional benefit, and altruistic benefit, seem to form the place dependence with multiple combinations under different context.

To start with, the reputation gain could constantly predict the place dependence in most cases, with the only exception for locations that are perceived from the collectivism perspective of context. Surprisingly, past studies have supported the argument that sharing information related to co-owned knowledge, activities, and memories could help individuals to gain reputation from the community or organization (Ensign and Hebert, 2010; Emelo, 2012; George *et al.*, 2016). However, this finding is rejected in the result of this study. And one possible explanation for this anomaly could be the ignorance of reputation gain during the sharing of locations that are linked with collective relationships. Since the contexts within which past studies conducted are mainly online communities (Ensign and Hebert, 2010; Emelo, 2012), individuals will not possess a close

relationship with others on these communities like the ones connected through locations. Therefore, people will expect high returns in reputation for personal benefits in these studies. But in the context of location-based information, because the meaning and reputation of locations will be limited within a limited circle of individuals (Kyle *et al.*, 2004; Lewis *et al.*, 2010), people may attach less importance on reputation, but more on altruistic benefits for a collectively affiliated location. As for other contexts, the reputation return is a solid predictor of place dependence, which matches with the findings in past studies.

Then, for the relationship benefit, it acts as a basic element in the formation of place dependence regardless of the contexts. The connection between the relationship benefits and place dependence is quite straightforward, and widely supported by past studies (Kyle *et al.*, 2004; Ramkissoon and Mavondo, 2015; Cheng and Kuo, 2015). Especially in the scope of social media, the interpersonal relationship is a critical factor in motivating individual to share information to others (Kapoor *et al.*, 2018). Still, although the relationship benefit, as a unified concept, is significantly related to the place dependence, its form could vary across different context. For example, for the sharing of locations that collectively shared among a group people, the relationship benefit lies in the maintenance of intra-group relationships (Barkhuus *et al.*, 2008). Besides, for the sharing of locations that recognize individual's hobbies, advantages, and habits, the relationship benefit will be related to the possibility in finding new friends (Zhang and Luo, 2016).

Next, for the emotional benefits, which defined as the pleasure or ease of stress from the sharing behaviour, although it is shown as an insignificant indicator of place dependence in the general model testing, it could still predict the place dependence under certain contexts. Specifically, in the contexts where locations are perceived from collectivism and connectedness perspectives, the emotional benefit is examined as contributing factor for place dependence. For one thing, since locations could be used as a method to gain pleasure if the experience are shared with friends (Barkhuus *et al.*, 2008), the locations in the collectivism context thus could generate such benefits related to the place dependence. For another thing, if the location is well embedded within the surroundings and widely connected with the environment, then it could commonly be seen as a

safe haven for individuals to ease the stresses and pressures (Gieryn, 2000). In social media environment, the sharing of this type of location could also provide a similar effect. And past studies have supported this statement by claiming that people could be happy simply through the sharing behaviour on social media (Chung *et al.*, 2016), and the information that could make them feel safe will strengthen this effect (Hur *et al.*, 2017). In addition, because the contexts from distinctiveness and egoism perspectives provide less senses of common views and native impressions, which are believed as main sources for location-based emotions (Cristoforetti *et al.*, 2011), the emotional benefit will thus be less important in predicting place dependence for these context.

Lastly, for the altruistic benefit associated with the location-based information sharing behaviour, it significantly influences the place dependence under contexts in collectivism and distinctiveness perspectives, but has no effect in egoism and connectedness perspectives. Firstly, for the reason that altruistic benefit aims to assess the benefit for the sake of others rather than themselves(Batson *et al.*, 2011; Ma and Chan, 2014; Shahzalal and Font, 2018), it possesses a nature within the community-based or environment. Thus, when faced with locations that are connected with people collectively, the sharing of such locations could increase the place dependence in providing positive images for the whole community (Riger and Lavrakas, 1981; Gu and Ryan, 2008), as well as to boost the cohesion within the group (Barkhuus *et al.*, 2008). Besides, for the distinctiveness perspective of context, the location with conspicuous features will attract more curiousness from individuals (Steenson and Donner, 2017), and the uniqueness of such locations among their surroundings will make people feel unfamiliar with them. Therefore, the place dependence of these locations could be achieved through the altruistic information sharing of individuals in providing valuable information like personal comments, experience, and evaluations for the acknowledgement of others. For example, people are found in favour of providing dining experiences on Foursquare to recommend or prevent others to visit a restaurant (Frith, 2014).

7.3 Conclusion

Based on the findings and results from past studies (Saker, 2017; Raymond *et al.*, 2017; Evans, 2018; Fuchs, 2021; Lim *et al.*, 2021), this study demonstrates

that individuals will process the location-based information from a dual-process perspective, with both the perception of place identity from impulsive system, and the evaluation of place dependence from the reflective system. Moreover, the weighting of importance in two systems will be adjusted based on the privacy concern that individual perceives during the sharing of location-based information. With a separation of place features, two sets of factors that correspondingly related to the place identity and place dependence are identified. Overall, the relationship of these constructs within the dual-process model are proposed and examined with the collected data from scenario-based surveys.

Moreover, as the main motivation of this thesis, the influence of location-based contexts is explored through interviews in the qualitative study. Two types of contexts, along with four perspectives are developed based on the responses from the content analysis of participants. With the findings for contextual factors, the relationships proposed in the proposed research framework are further discussed under various context.

Based on the discussion of obtained results in the study, it could be concluded that individuals are likely to rely on both impulsive and reflective processing in the decision-making process for location-based information sharing, and the cognitive dispositions and dynamic in both systems will be affected by the situated context of location. Moreover, this study demonstrates that privacy concern acts effectively as an agent in managing the balance of two processing system. And the variation of its effects could provide alternative explanations for the challenge of privacy paradox, which was regarded as a main problem in the location-based information sharing. As for the construction of place identity and place dependence under various contexts, there is no such thing as stable combination or recipe exists for a consolidated formation of these two types of place attachments. The influence of contexts has shown a wide impact on every aspect of the decision-making process from the dual-process perspective, including the influence, the balance, and the contributing elements of two processing systems.

Chapter 8 Implications and Limitations

In order to investigate the dynamics in the decision-making process of the sharing of location-based information, this study utilizes a mixed-method approach to explore and examine the influence of contexts in manipulating the individual's perception in processing related messages. Furthermore, based on a systematic discussion on results from both qualitative and quantitative studies, the influence of context is unpacked from the dual-process perspective.

8.1 Theoretical Implications

This thesis supplements previous studies on providing possible explanations for multiple debates and challenges existed in the literature. Firstly, conflicts of findings could be widely identified in existing studies about the location-based information sharing, the relationship between identified factors and sharing behaviours is quite unstable across studies, models, and environments (Knijnenburg *et al.*, 2017; Steenson and Donner, 2017; Shi *et al.*, 2018; Pang, 2021). With the emergence of social media and mobile devices, this trend is worsen by the increased accessibility of distant locations and blended bounds between physical and social worlds (Farman, 2020), there is a call for the establishment of clear frameworks in recognizing these variations during the sharing of location-based information.

Although past studies have proposed that the sense of place relies on the mental representation of physical, social, and personal dimensions (Raymond *et al.*, 2017), the exact directions within each dimension still are in need of in-depth investigations. Thus, follow the suggestions in recent studies (Riboni *et al.*, 2011; Carter, 2013; Yao *et al.*, 2018), and with an aim to re-examine the findings in past studies, as well as to build boundary conditions for the influence of factors (Markóczy *et al.*, 2013; Liu *et al.*, 2019b), this thesis introduces the concept of location-based contexts into the investigation. Through the interviews with participants, this thesis explores the dynamics within the scope of location-based information sharing on social media. By analysing the content expressed in the responses, the aspects of location-based contexts are discussed, and four perspectives within the social and physical contexts are identified and

constructed with corresponding measurements. This framework provides a foundation on how to build bounds between different contexts in location-based information, and also guide the future research on how to measure these bounds to create scenarios for quantitative examination. The findings of this study contribute to the literature in initializing the discussion about contexts with a combination of location-based information and social media environment, and providing a foundation for the analysis of boundary conditions in the investigation of influences of factors in the related information sharing.

Secondly, from the perspective of dual-process model, past studies have discussed extensively on the dynamic between two processing systems (Evans, 2018; De Neys and Pennycook, 2019). Specifically, these discussions mainly take two different paths in explaining the changes of influences of two systems under different situations. Moreover, past studies mostly took the assumption that the decision-making process during the location-based information sharing is a stable and rational procedure (Krasnova *et al.*, 2012; Knijnenburg *et al.*, 2017; Wang *et al.*, 2019). However, through a dual-process perspective, this thesis incorporates the impulsive processing of information and autonomous behaviour into the study by providing a substantive understanding of the influence of location-based information on the sharing behaviour.

On top of that, the result from the quantitative examination demonstrates that individuals will rely on both impulsive processing (i.e., place identity) and reflective processing (i.e., place dependence) in making the final decision in information sharing. In addition, privacy concern serves as an agent in moderating the reflective system, and more importantly, as a coordinator between the two systems under various contexts. With the increase of the privacy concern, the influence of reflective system will be reduced, and simultaneously, individuals will rely more on the impulsive system in making decisions. This result have confirmed the findings in past studies about the proposition on how the two systems interact under different situations (De Neys and Pennycook, 2019). The quantitative result obtained in this study illustrates a distinction of influences imposed by the privacy concern on two processing system, and the discussion on this mechanism provide alternative explanations for the privacy paradox challenge (Norberg *et al.*, 2007; Wilson and Valacich,

2012; Taddicken, 2014). That is, the high expression of privacy concerns will impose great influence if the decision is made through reflective system, and it will not influence the impulsive system because it does not interact with this type of thinking. Consequently, the difference between the thinking styles and systems are the main reason for the diverse outcome associated with the privacy concern.

Moreover, through the testing of factors' effects under various contexts, dynamics in the dual-process model are obtained for the two types of place attachments. The result explicitly presents that the contribution of these antecedents to both systems will vary in their significance of influences under different contexts. In this way, the findings of this study additionally contribute to the literature by examining the effect of place attachments on the sharing behaviour from a dual-process perspective, and the dynamics identified during the investigation could provide valuable insights for the debates in past studies, such as boundary conditions of privacy concerns, and the privacy paradox problem.

Lastly, by testing the influence of contributing elements for both place identity and place dependence, this study confirms most of the findings about the effects of related factors in the information sharing literature (Sun *et al.*, 2015; Kim, 2016; Saker, 2017; Papangelis *et al.*, 2020). Meanwhile, the mediated effects of these factors on the sharing behaviour through the two processing systems in the dual-process model are also examined. The connections between the contributing factors and corresponding place attachment are also inspected under various contexts. The results show that the cognitive dispositions and structures of both place identity and place dependence vary across contexts, which matches with the conflicts for similar factors in past literature (Knijnenburg *et al.*, 2013b; Beldad and Kusumadewi, 2015; Wisniewski *et al.*, 2020). Through this finding, this study contributes to the literature about the boundary conditions in terms of contextual factors for the effects of identified factors in the existing studies, and the variation of their influences also reveals some facts about the individual's perception under different contexts.

Overall, from a dual-process perspective, this study has investigated the location-based information sharing phenomenon by additionally considering

both the place attachments and impulsive processing into the traditional understanding of location-based information. Moreover, with the analysis and discussion of location-related contexts, this study further tested the influence of identified factors on the final sharing behaviours under different contexts. The findings of this study open a new direction in the investigation of location-based information sharing, and the discussion on the influences of contexts could provide valuable insights for boundary conditions and existing information sharing challenges. Lastly, although this study focuses on the location-based information, the obtained findings could still be a reference for other types of information sharing studies.

8.2 Practical Implications

The value of location-based information has been highly recognized by a wide range of practitioners in the area of tourism (Filieri *et al.*, 2015; Kim and Fesenmaier, 2017; Dwyer *et al.*, 2019), marketing (Yavuz and Toker, 2014; Lim *et al.*, 2021), social media (Schwartz and Halegoua, 2015; Evans and Saker, 2017; Berhanu and Raj, 2020), and commercial platforms (Guha and Birnholtz, 2013; Saker and Evans, 2016; Saker, 2017). Despite the importance of location-based information in the business area, the complexity in understanding the place meaning and the ignorance of relationship between location and individuals make it difficult to develop services that meet the demand of users. However, with the insights obtained from this thesis, several suggestions could be made to the practitioners from all kinds of industries.

Firstly, one of the challenges for existing location-based services is to find the appropriate information that adapted to the on-site environment for users (Gay, 2009), and the failure in achieving this will lead to increased concerns and upsets through the usage (Xu *et al.*, 2009). The key to the development of this so-called context-aware services lies in the deep understanding of location-based contexts, both physically and socially (Gay, 2009). Thus, the finding of this study in constructing the understanding of location-based contexts with a background of mobile networks and social media could help the service providers to figure out the meaning of locations for individuals under different contexts. And the identified perspectives and contexts for the perception of location-based information could further be used to classify, label, and group locations. For

example, social media platforms like Facebook has launched similar functions for users to choose the type of their check-ins place (Wang and Stefanone, 2013). However, these provided types choose to highlight the functionalities of the location, instead of the associated context. Consequently, the encouraging effect of this function will be largely limited, because the place with same functions will also impose different impressions and perceptions on individuals. And with an updated understanding on contextual factors, these labels could be provided with more salient information that directly linked with the individual. Consequently, these more relevant and personalized information will have better performance in motivating people to use the function in sharing location-based information on social media. Then, this study could contribute to such services by attaching additional contextual awareness to this information, thus help the service provider to understand their users better.

Secondly, the existing ignorance of the impulsive processing of location-based information has biased the strategy that practitioners took in motivating individuals to share information to others (Novak and Hoffman, 2008; Wilson and Valacich, 2012). Heavy effort has been put on the benefits that individuals could receive from the location-based information sharing, including monetary returns, discounts, status, etc. (Sun *et al.*, 2015; Zhang and Luo, 2016) Nonetheless, such kind of strategy received low success rate in practice, not only because it neglects the match between locations and individuals, but also causes a concern of privacy during the evaluation of benefits. But with the understanding of how individuals perceive the location in terms of contextual factors, these services could be better designed to cater both impulsive and reflective cognitive processes in mind. For example, the trigger of past memories, everyday recordings, and recommendations from other friends could be utilized along with the monetary rewards to increase the possibility of individual in engaging with the service. And by adopting different types of physically perceived and socially evaluated place meanings, including functional, affective, and symbolic items, these services could be tailored to different users so as to address the problem in providing accurate and appropriate information. This finding has further expanded the strategy in motivating the individuals by recommending the appropriate place for corresponding

individuals from different groups. For example, if the platform would like to recommend a place to eat for local resident with the search term of "family gathering", then result could offer suggestions of local genuine restaurants to increase the experience of users and facilitate further interactions with the place.

Lastly, with the identified boundary conditions for influences of factors both on different place attachments and under various contexts, this study further provides in-depth guidance for practitioners to apply the findings. Especially, in the scope of tourism, although past studies have identified numerous factors in affecting individuals' sharing of travel experiences, comments, and recommendations (Dwyer *et al.*, 2019; Meng and Choi, 2019; Berhanu and Raj, 2020; Lim *et al.*, 2021), these factors were not well utilized into practical applications, because of the conflicts existed for their effects across studies. Thus, with the found dynamics for these factors in terms of their combinations and strengths in affecting the perception of locations and sharing behaviours, it could offer suggestions for practitioners in destination design and information diffusion. For one thing, the locations within a destination will have different characteristics, and naturally they will be associated with different perceptions and evaluations in the decision-making process. Thus, the design of these locations should be determined based on their contexts, with highlights on the corresponding factors that are salient in both place attachments. For example, if a destination would like to motivate the tourists to share destination-related information on social media, it can either design a conspicuous corner with high values in providing relationship and reputation boost for tourists, or organize activities to encourage tourists to explore the 'secrets' within local buildings. Actually, many example could be observed in real world practices. For example, Xi'an, as the city with a long and glory history, has required the buildings around the historical area to be designed and decorated like ancient traditional Chinese buildings. This policy could both represent the two sides of processing systems: 1) it facilitates a high level of place dependence with the high value of social benefits from the one-of-a-kind building of famous brands; and it also creates a strong sense of place identity that these buildings represent the history of China. As a result, these buildings received massive attentions from visitors, and they are extensively shared on social media in China (Hsu *et al.*, 2009). For another

thing, the tourist practitioners could also cooperate with social media platforms, if they have found that an individual's friends have visited certain destinations, then they could motivate this individual to also share his/her experience on social media with this information. Besides, the platform could also record the time and companions of the past sharing of destinations, so that it could push notifications to their users to motivate the review of this experience afterwards when something coincides with this information, which may facilitate the further sharing behaviour.

8.3 Limitations and Future Research

Despite the objectives that this study has achieved, this study also has a few limitations as follows. Firstly, the participants recruited in the qualitative study mainly consist of college students. Although the collected sample data from them can well reflect the reactions of core users on social media, the findings could be extended by expanding the selection of participants with a wider range in ages and occupations.

Besides, in order to better understand the mechanisms during the sharing of location-based information, more related factors should be included in the investigation, to form a wider picture on their relationships from the dual-process perspective. Moreover, the discussion for the results obtained from quantitative examination under various contexts has shown a possible overlap between the two processing systems, thus it requires further investigation on the structure of place attachments, and their relationships with corresponding factors.

Therefore, for the future studies, the findings of this research could be enriched by further examination and development of the established framework of contextual factors within the topic of location-based information sharing. Also, this established framework could be utilized as a foundation for both the quantitative testing and qualitative exploration. For the quantitative study, this framework could be used to construct the conceptualization of contextual factors, and the combination of these factors with other related variables could help researcher to develop new insights in this area. For the quantitative study, this framework could be a starting point in understanding the concept of context in location-based information, and within the framework, more discussions could

be made to fill up the blank space for the unexplained part. Besides, the findings of examination on the dual-process model under different contexts also laid a solid foundation for future research in continuously exploring the dynamics of how two competing systems function under different situations. For one thing, the potential overlap of contributing factors in two processing systems could be further examined with the consideration of contexts, and it could offer insights for the blurred bounds of two systems in a dual-process model. For another thing, other moderation factors that could manipulate the weight between two systems. Rather than the privacy concerns, other factors like immediate gratification and social norms could also be tested for their role in dual-process models.

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Appendix A. Questionnaire Illustration

Participant Information Sheet

Unravelling the Location-based Information Sharing on Social Media among Various Contexts: from a Dual-process Perspective

Dear Participant,

Thank you for agreeing to participate in this survey in connection with my PhD dissertation/research at the University of Nottingham Ningbo. The project is a study of *Unravelling the Location-based Information Sharing on Social Media among Various Contexts: from a Dual-process Perspective.*

Your participation in the survey is voluntary. You are able to withdraw from the survey at any time and to request that the information you have provided is not used in the project. Any information provided will be confidential. Your identity will not be disclosed in any use of the information you have supplied during the survey.

The research project has been reviewed according to the ethical review processes in place in the University of Nottingham Ningbo. These processes are governed by the University's Code of Research Conduct and Research Ethics. Should you have any question now or in the future, please contact me or my supervisor. Should you have concerns related to my conduct of the survey or research ethics, please contact my supervisor or the University's Ethics Committee.

Yours truly,

Teng Ma

Contact details:

Student Researcher: Teng Ma (Teng.Ma@nottingham.edu.cn)

Supervisor: Dr. Alain Chong (Alain.Chong@nottingham.edu.cn)

University Research Ethics Committee Coordinator, Ms Joanna Huang

(Joanna.Huang@nottingham.edu.cn)

PARTICIPANT CONSENT FORM

Project title: *Unravelling the Location-based Information Sharing on Social Media among Various Contexts: from a Dual-process Perspective*

Researcher's name: Teng Ma

Supervisor's name: Dr. Alain Chong

· I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part.
· I understand the purpose of the research project and my involvement in it.
· I understand that I may withdraw from the research project at any stage and that this will not affect my status now or in the future.
· I understand that while information gained during the study may be published,
· I will not be identified and my personal results will remain confidential.
· I understand that the interview will be recorded.
· I understand that data will be stored in accordance with data protection laws.

Contact details

Researcher: Teng Ma (Teng.Ma@nottingham.edu.cn)

Supervisor: Dr. Alain Chong (Alain.Chong@nottingham.edu.cn)

UNNC Research Ethics Sub-Committee Coordinator:

Joanna.Huang@nottingham.edu.cn

Part A. Demographic Information

Q1.1 What is your gender?

A. Male
B. Female

Q1.2 What is your age?

A. Under 20
B. 20 - 25
C. 25 - 30
D. 30 - 35
E. 35 - 40
F. Above 40

Q1.3 What is your income level?

A. Full-time employment
B. Currently unemployed
C. Student
D. Others

Q1.4 What is your income level per month?

A. Less than 5000 RMB
B. 5000-10000 RMB
C. 10000-15000 RMB
D. 15000-20000 RMB
E. 20000-25000 RMB
F. Above 250000 RMB

Part B. Please answer the following questions based on the perceptions you have on what you have experienced in the MiniProgram

1. I feel the place I see on the page…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
is a reflection of me.	○	○	○	○	○	○	○
says a lot about who I am.	○	○	○	○	○	○	○
makes me feel that I can really be myself there.	○	○	○	○	○	○	○
reflects the type of person I am.	○	○	○	○	○	○	○

2. In terms of goal accomplishment of life/work/social, I feel the place I see on the page…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
is the best choice for what I want to do	○	○	○	○	○	○	○
is hard to be substituted to any other place for doing the types of things I do.	○	○	○	○	○	○	○
is more important than others.	○	○	○	○	○	○	○

is incomparable.	○	○	○	○	○	○	○
gives more satisfaction out of visiting.	○	○	○	○	○	○	○

3. I feel this place…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
make me feel it is very meaningful to me	○	○	○	○	○	○	○
reminds me about my past	○	○	○	○	○	○	○
evokes strong memories for me	○	○	○	○	○	○	○

4. For this place…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
It feels like a personal compliment to me when someone praises it	○	○	○	○	○	○	○
I feel embarrassed if someone criticizes it	○	○	○	○	○	○	○
I feel proud to be connected with it	○	○	○	○	○	○	○

5. For this place…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
My friends/family would be happy if they see me checking in there	○	○	○	○	○	○	○
I rely on this location to communicate with my friends/family	○	○	○	○	○	○	○
This location is preferred over other places by my friends/family	○	○	○	○	○	○	○

6. For this place…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
The sharing of this location can boost my mood	○	○	○	○	○	○	○
The sharing of this location can smooth my concerns and worries	○	○	○	○	○	○	○

7. For this place…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
I can help other people through sharing location information	○	○	○	○	○	○	○
Sharing and commenting on locations can help others with similar problems	○	○	○	○	○	○	○
I enjoy helping others through sharing locations	○	○	○	○	○	○	○

8. For this place…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
I can earn respect from others by sharing this location.	○	○	○	○	○	○	○
Sharing this location would enhance my personal reputation online.	○	○	○	○	○	○	○
Sharing this location would improve my status online.	○	○	○	○	○	○	○

9. For this place…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE

Sharing this location would strengthen the tie between other users and me.	○	○	○	○	○	○	○
Sharing this location would create new relationships with new friends online	○	○	○	○	○	○	○
The location sharing would expand the scope of my association with other users online	○	○	○	○	○	○	○
The location sharing would draw smooth cooperation from outstanding users in the future	○	○	○	○	○	○	○
The location sharing would create strong relationships with members who have common interests online.	○	○	○	○	○	○	○

10. For this place…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
I belong in this place	○	○	○	○	○	○	○
This place is home for me	○	○	○	○	○	○	○
I am totally comfortable being in this place	○	○	○	○	○	○	○

11. For this place…

	EXTREMELY DISAGREE	2	3	4	5	6	EXTREMLY AGREE
I am concerned that a person can find private information about me on the Internet.	○	○	○	○	○	○	○
I am concerned about submitting information on the Internet, because of what others might do with it.	○	○	○	○	○	○	○

I am concerned that the information I disclose on the Internet would involve many unexpected problems.	○	○	○	○	○	○	○
I am totally unconcerned that the information I disclose on the Internet would bring about privacy-related problems (reverse item).	○	○	○	○	○	○	○
I am concerned that a person can find private information about me on the Internet.	○	○	○	○	○	○	○

Appendix B. Interview Protocols

Semi-Structured Interview Protocol Topic: Unravelling the Location-based Information Sharing on Social Media among Various Contexts: from a Dual-process Perspective

1. **For the recording, could you state your name, how long you have shared location-based information on social media, and what are the main platform you have used in sharing location-based information?** Probe: what are the main reasons for you to use these platforms?
2. **Take a couple of minutes to remind yourself about one of the most memorable experience for your sharing of location-based information on social media? It could be more than once.** Probe: Why are they memorable?
3. **Wher is the location and what are the basic information and experience for that location?** Probe: What are the main motives for this sharing? How would you describe this sharing in terms of types and categories?
4. **Why do you share this location on social media? Please provide one or two reasons.** Probe: What are the sources of these reasons? When does the reason emerge? Do you have other sharing of location-based information for the same reason?
5. **Is there anything special about the context of that location in terms of timing, space, identity, etc.?** Probe: How does the location make you think that? Is there any overlap for the appearance of more than one aspects of contexts that drives you in sharing the location? Is there any example that you choose not to share the location under the same context?
6. **How would you describe the unified context for the sharing of that location?** Probe: What aspects of context are included in your description? How important is it in your decision to share? If the unified context is changed, would you still share the location, or which part of the unified context will manipulate you sharing decision?

Appendix C. Code Frame

Table A.1 Code Frame of Scenarios

Categories	Code name	Codes
Interactions	Interpersonal relationship	*Mom, dad, friend, family, relative, group, together, sister, brother*
	Activity	*Drink, eat, have fun, dance, sing, coffee, take photo, spend time, chill, sightseeing, travel, camping, shopping*
	First experience	*Good scene, impressive, normal, new, first time, never, familiar, big, small, conspicuous, local, stylish, vintage*
Expected outcomes	Others' comments	*Lazy, angry, not at work, cheat, promise, memory, bonding, regular*
	Social interactions	*Likes, comments, replies, call, find, recommendation, introduce, meet*
	Tangible rewards	*Coupons, discounts, money, gifts, benefits, experience, priority*
Adjective	Subjective	*Fun, interesting, boring, good, bad, etc.*
	Objective	*Metres, m^2, kg, away, left, right, top, bottom, etc..*
Sharing decisions	Audience	*Friends, others, family, not all people, care, from same school, together*
	Date and time	*Christmas Eve, New Year Eve, holiday, weekend, weekday, every first Monday, morning, evening*
	Platform	*Dianping, Foursquare, Moments, Weibo, WeChat*