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Demystifying the nexus between social media usage and overtourism: evidence from Hangzhou, China

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ABSTRACT

Several destinations across the globe experience the challenge of overtourism. Literature identifies social media as one of the driving factors of overtourism. Although some prior studies have explored the relationship between social media and overtourism, the connection between the two still lacks a strong empirical validation. In light of this, we empirically established the relationship between social media usage (SMU) and overtourism, drawing upon Uses and Gratifications Theory (UGT). Quantitative data were collected from 209 tourists who had visited Hangzhou and analysed using PLS-SEM. Research findings reveal that social media usage contributes to overtourism through the mediating effect of tourist flow concentration, even though the influence is weak. Consequently, only 10.2% of the variance in overtourism is explained by the model, suggesting a weak effect of social media usage on overtourism. Implications and limitations are discussed, and avenues for further research are suggested.

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Introduction

The term “overtourism” has become a mantra and was shortlisted for the Oxford English Dictionary’s Word of the Year in 2018 (Clancy, 2020). Furthermore, as Francis (2018, p. v) states, overtourism, “a subject mostly confined to academic papers and classroom discussions, became front-page news in The New York Times, The Wall Street Journal and The South China Morning Post,” signifying the global attention it draws. The increasing prevalence of this global tourism phenomenon creates tension in urban and rural tourist destinations alike (Lee et al., 2020; Milano, Novelli, & Cheer, 2019; Pechlaner et al., 2020). The impacts of overtourism related to overcrowding, touristification and cultural and environmental deterioration as well as residents’ dissatisfaction and the loss of sense of place have become pressing challenges in several destinations across the globe, igniting

heated protests and anti-tourism movements (Clancy, 2020; Dodds & Butler, 2019b; Innerhofer et al., 2020; Insch, 2020; Jang & Park, 2020). The pressure of overtourism is felt not only in protected areas but also in urban areas (Jang & Park, 2020; Milano et al., 2019). Consequently, famous cities including Paris, Barcelona, Venice, and Amsterdam struggle with the challenges of overtourism, as their communal areas and residential neighbourhoods are being increasingly transformed into tourist spaces (Freytag & Bauder, 2018; Milano et al., 2019).

Terms relating to overtourism such as “mass-tourism,” “congestion,” “ecological degradation,” “inflation,” and “antagonism” are common; however, what defines present-day overtourism is the frequent occurrence of resident protests and anti-tourism movements (Clancy, 2020; Dodds & Butler, 2019a, 2019b; Jang & Park, 2020). Dodds and Butler (2019a)

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state that overtourism is also referred to in positive terms such as “loving places to death,” “dealing with success,” and “tourismphobia.” Recently, both the antecedents and repercussions of overtourism have been topics of discussion in mainstream and social media as well as in academia (Gretzel, 2019; Lee et al., 2020; Pasquinelli & Trunfio, 2020). Overtourism is defined by Milano, et al. (2019) as the excessive growth of visitors to tourist destinations, which leads to overcrowding. Capocchi et al. (2019) characterise overtourism as a phenomenon that occurs because of unregulated tourism growth, increasing tourist flow, and inappropriate destination management practices. When overtourism occurs, locals are afflicted with the repercussions of provisional and seasonal visitor flow to an extent that permanently alters communities’ lifestyles, prevents access to facilities and amenities, and undermines the quality of life. Overtourism happens when tourism exceeds the carrying capacity thresholds of destinations, leading to congestion, noise, litter, environmental exploitation, property speculation, increased cost of living, touristification, disneyfication, and locals’ anti-tourism movements (Colomb & Novy, 2016; Milano et al., 2019; Pasquinelli & Trunfio, 2020).

Several factors are identified in the existing literature as drivers of overtourism. A high number of visitor arrivals is considered a symptom of the phenomenon (Alonso-Almeida et al., 2019; Dodds & Butler, 2019b). The unrestrained tourism development pattern, a rise in the middle classes, the emergence of new source markets, globalisation, aggressive tourism marketing, the advent of low-cost carriers, the emergence and explosion of the sharing economy, and the boom in Web2.0 technologies, among others, are discussed as underlying factors of overtourism (Aall & Koens, 2019; Costa et al., 2018; Goodwin, 2017; Jordan et al., 2018; Peeters et al., 2018; Phi, 2020; UNWTO, 2018).

Social media utilisation has exploded since the emergence of Web2.0, a network platform containing websites with rich user-generated content and characterised by a participatory culture and interoperability that provide ease of use for end users. The accumulation of information generated by social media users influences tourists’ travel decision-making process (Bourliataux-Lajoinie et al., 2019; Ho & Gebsoambut, 2019). In other words, since information is essential to the tourism industry, the production, consumption, and usage of social media content have eventually a profound effect on both

supply and demand for these services. Primarily, social media content generated by users is used for information-seeking, entertainment, self-presentation, and socialisation (Hsu et al., 2015). The information available on social media includes facts related to the nature and attributes of destinations as well as tourists’ experiential testimonies (Alonso-Almeida et al., 2019; Stepchenkova & Zhan, 2013). Together, these create an impression of a destination image (Jani & Hwang, 2011), evoke a desire to travel (Fotis et al., 2011), and influence travel decision-making (Sotiriadis & Van Zyl, 2013). Social media content such as tourists’ experiences shared online might evoke a desire to escape (Gretzel, 2018), sparking envy in users, including peers, and inspiring an intention to travel to the same destination (Bourliataux-Lajoinie et al., 2019; Taylor, 2020). In summary, social media usage gratifies tourists’ needs, induces, and changes tourism demand, and creates an impression of a destination, and thereby influencing tourist flow (Bourliataux-Lajoinie et al., 2019; Gretzel, 2019; Gutiérrez-Taño et al., 2019).

Furthermore, existing literature suggests that information technology, especially social media, is responsible for promoting overtourism. For example, Gössling (2017) concludes that social media impacts tourism sustainability in numerous complicated and ambivalent ways, sometimes with straightforward negative impacts. Moreover, Butler and Dodds (2022) note that social media turn inconspicuous attractions into tourist hot spots with excessive visitation through mentions on social media and social media users’ impression management. Similarly, Gretzel (2019) reports that social media have the catalyst role in concentrating tourists on places selectively posted on sites by motivating tourists to engage in similar travel experiences.

Despite shedding light on the association between social media and overtourism, existing literature has not yet substantially elucidated how social media usage influences overtourism via robust empirical evidence. Alonso-Almeida et al. (2019) examines visitors’ online reviews of destinations but have not captured other crucial social media usage dimensions, including entertainment, self-presentation, and socialisation. Moreover, their study fails to properly illustrate how social media contribute to overtourism. Gretzel (2019) investigates how social media usage contributes to overtourism. However, this study also lacks confirmatory analysis and does not support premises with empirical data. Additionally, so far, no researchers have used advanced quantitative research

methods to explain the connection between social media usage and overtourism. Given these shortcomings, the current research examines the phenomena of social media-induced overtourism and thereby establishes a sound theoretical model informed by the Uses and Gratifications Theory (UGT), using Hangzhou, China, as a research context. As part of its structural model, the study examines the relationship between visitor flow concentration and overtourism and further explores the four drivers behind social media usage (i.e. information seeking, self-presentation, entertainment, and socialising) to accurately measure their contribution to overtourism. The study uncovers that social media usage contributes to overtourism through the mediating role of tourist flow concentration although the influence is weak. Accordingly, only 10.2% of the variance in overtourism is explained by the structural model suggesting a weak effect of social media usage on overtourism. Research findings advance existing theory by explaining the nexus among social media usage, tourist flow and destination overcrowding. From a managerial aspect, given social media has a limited effect on destination congestion, destination management organisations should use social media as a potent tool for destination marketing. Moreover, destination stakeholders can accurately identify visitor distribution patterns and hot spot areas by analysing geotagged social media posts.

The rest of the paper is organised as follows. First, we critically review the relevant literature covering the topics of overtourism, tourist flow, and social media usage along with the Uses and Gratifications Theory (UGT). UGT is employed to establish a conceptual model and propose research hypotheses. Methodological issues are then presented, followed by a discussion of the research findings. The paper eventuates by presenting conclusions and suggesting directions for future research.

Literature review

Conceptualising overtourism

Existing literature lacks a universal definition of overtourism (Pasquinelli & Trunfio, 2020), although the phenomenon is not new (Koens et al., 2018). UNWTO (2018) underscores the increasing negative impacts of tourism on both locals' perceived quality of life and visitors' experiences. Peeters et al. (2018) highlight that overtourism may occur when the negative impacts of tourism exceed its physical, ecological,

social, economic, psychological and political capacity thresholds. Capocchi et al. (2019) describe overtourism as a dynamic process of tourism growth and tourist flow concentration and discuss its impacts on destinations' economic, socio-cultural, and environmental dimensions along with the pressure it puts on destination governance. The tourism growth paradigm and development approaches adopted in tourist destinations are considered the root causes of overtourism (Phi, 2020). Other driving factors include an increase in tourist arrivals, destinations' economic growth (Goodwin, 2017); globalisation (Pechlaner et al., 2020), aggressive destination marketing, the emergence of social media (Jordan et al., 2018; Phi, 2020), improvements in infrastructure, tourism facilities and transportation (Aall & Koens, 2019; Costa et al., 2018), and the burgeoning of the sharing economy (Bakker & Twining-Ward, 2018).

Overtourism creates various undesirable impacts in destinations, including congestion and inflation (Jordan et al., 2018; UNWTO, 2018), ecological pressure in protected areas (Weber, 2017), stress on and resource competition in local communities (Koens et al., 2018), pressure on destination management organisations (Eckert et al., 2019) and undermining visitors' holiday experiences (García-Hernández et al., 2017; Gössling, 2017).

Inflation triggered by overtourism results in soaring living costs in destinations, including rising real estate and property prices (Koens et al., 2018; Martín et al., 2018). From a sociocultural standpoint, overtourism may also negatively affect residents' quality of life, by increasing the crime rate, and jeopardising destinations' socio-cultural fabrics (Jang & Park, 2020; Kuščer & Mihalič, 2019). Regarding the environment, overtourism creates pollution of various kinds, puts additional pressure on the destination's ecology and weakens the destinations' image, eventually creating anti-tourism sentiment. The phenomenon may turn once-spectacular destinations into tourist slums as they lose their authentic qualities, and international reputation and brand, where the most economically beneficial long-haul international tourists replaced by weekenders and same-day visitors (Butler, 1980; Dodds & Butler, 2019b; Jang & Park, 2020; Kuščer & Mihalič, 2019; Oklevik et al., 2019).

Theory guiding the study

By creating logical connections between fundamental concepts (Lengkeek & Jacobsen, 2016) theory

elaborates on how and why a particular phenomenon functions (McCool, 1995). Therefore, theory guides scientific research and assists further in-depth analyses (Lengkeek & Jacobsen, 2016; Wondirad et al., 2021). It is customary to adapt and integrate theory from more mature subjects to better understand and explain research questions in disciplines with weak theoretical foundations such as tourism (Wondirad et al., 2020). Against this backdrop, the current research adopts UGT to better comprehend and explain the relationship between social media usage and overtourism in Hangzhou, China. UGT has specific relevance to social media despite its application in the marketing and social media literature remains limited (Whiting & Williams, 2013). UGT focuses on:

(1) the social and psychological origins of (2) needs, which generate (3) expectations of (4) the mass media or other sources, which lead to (5) differential patterns of media exposure (or engagement in other activities), resulting in (6) need gratifications and (7) other consequences, perhaps mostly unintended ones. (Katz et al., 1974, p. 510)

This study concentrates on understanding media usage patterns and media effects as conceptualised under this framework.

Rubin (2002) asserted that UGT provides new insights into audience behaviour and consumption. Early studies on gratification shed light on audience motivation, where researchers such as Lazarsfeld (1940) examines the appeal of radio dramas and Berelson (1949) explores the function of newspaper reading. These studies revealed that audiences relied on media for emotional catharsis, fulfilling daydreams, seeking information and advice, interpreting public affairs, spicing up daily life, and improving social status.

In the 1970s, gratification scholars aimed to categorise audience motives for media use by identifying how people use media to fulfil their needs stemming from social roles and psychological tendencies (Katz et al., 1973). These needs often either strengthen or weaken a connection, whether cognitive, affective, or both, with a particular reference group (e.g. self, family, or society). For instance, Katz et al. (1973) groups media use as helpful in meeting individuals' needs related to strengthening their connections. McQuail et al. (1972) formulates a typology of mass media usage from a personal use perspective. They grouped media usage into four components: diversion (escaping routine and for entertainment); personal relations (social utility, companionship); personal identity (personal reference, reality exploration, and value

reinforcement); and surveillance (new information and knowledge acquisition). Conversely, Lull (1980) develops the media-use typology based on social use, consisting of structural use and relational use. Structural use considers media as an environmental reference (background noise, companionship, and entertainment) or behavioural regulator (punctuation of time and activity, talk patterns). For relational use, he suggested that families use television for communication facilitation (e.g. a topic of conversation), affiliation or avoidance (e.g. interpersonal contact), social learning (e.g. imitation), or competence or dominance (e.g. role enhancement).

Subsequently, UGT has been effectively designed and shown to help comprehend the theoretical aspects of evaluating Internet use (Stafford et al., 2004). These authors sought to identify three dimensions of gratification for using the Internet, including content, process gratifications, and social gratification specific to using the Internet. UGT also comprehended the gratifications of new media use, such as social media, in which users sustained engagement in social media for hedonism (enjoyment, fantasy, and escapism), socialisation (social interaction and social presence), and utility (achievement and self-presentation) (Li et al., 2015). Unlike traditional media, social media divide general use into numerous sectors, allowing for a more thorough explanation of how motivations are connected to use (Smock et al., 2011). In tourism literature, UGT highlights that gratifications for informativeness, social interactivity, and playfulness enabled tourists to continuously use social media for tourism purposes (Kim et al., 2019). Numerous scholars (e.g. Gan, Lee & Li, 2017; Ho & Gebsumbut, 2019; Ledbetter, Taylor, & Mazer, 2016; Leung, 2007; Ray, Dhir, Bala, & Kaur, 2019; Tran, Pham, & Le, 2019; Urista, Dong, & Day, 2009) use UGT to elucidate a broad range of research topics related to media usage and consumer behaviour.

As Katz et al. (1973) underline, UGT does not only focus on gratification as an ultimate goal but also seeks to understand the media's effects. UGT strives to explain the outcomes or consequences of media communication impacts such as attitude or perception formation (e.g. cultivation), behavioural changes (e.g. dependency), and societal effects (e.g. knowledge gaps) (Rubin, 2002). Some scholars have made assumptions about the connection between the functions that the media perform for individuals and those for society. Enzenberger (1972), for example, proposes that cameras may provide recreational gratification

for individuals while fragmenting society. Or, social media usage may gratify a tourist's need for pleasure, but it may also lead to unsustainable tourism (Gössling, 2017). Nevertheless, there is still limited empirical evidence to support the link between gratification and its effects, particularly pertaining to overtourism.

It is also important to note that UGT faces criticism since audiences of different ages or genders may have different motivations for choosing the same media, especially when the choice is quite limited. Therefore, UGT has more relevance today than in previous eras as a tool for understanding how individuals choose media options to meet their media consumption needs. Social media, as an explosively growing online social platform with various essential and evolving features, facilitates the production, organisation, and dissemination of relevant information while requiring minimal technical expertise (Gretzel et al., 2015; Sigala, 2011a).

Social media are increasingly utilised to satisfy the desires of information-seeking, entertainment, self-presentation and socialisation, among other uses (Alhabash & Ma, 2017; Ho & See-To, 2018; Hsu et al., 2015). The emergence of user-generated content and social networks has drastically altered the landscape of information communication technology (ICT), revolutionising how Internet users consume, discover, spread and create information (Sigala, 2011b). Information-seeking represents the desire to use social media to access accurate and up-to-date information (Hsu et al., 2015). UGC comprehends a wide variety of customers' stories, feelings, articulations, comments, descriptions, evaluations, ratings and recommendations (Stepchenkova & Zhan, 2013) featured in positive or negative sentiments, and gratification (Guo et al., 2017). Thus, UGC provides real-time and location-specific information to end users to help them develop destination awareness and image (Leung et al., 2013; Yoo & Gretzel, 2011).

Contrarily, the enjoyment factor of using social media refers to the enjoyment that consumers derive from its use. In the context of travel, this manifests as surfing interesting content pertinent to tourist destinations or tourist experiences (Lee & Ma, 2012; Hsu et al., 2015; Tussyadiah & Fesenmaier, 2009) and sharing one's own travel experiences (Bilgihan et al., 2016). Self-presentation describes a motivation to declassify private information to the online audience to enhance identity and boost personal status (Hsu et al., 2015; Lyu, 2016; Schlenker & Wowra, 2003). Finally, socialisation is the desire to connect or

reconnect with others to build and maintain relationships (Hsu et al., 2015). This is achieved online through communicating with others, constructing and maintaining relationships and networks, seeking companionship, exchanging information and engaging in online dialogue (Smock et al., 2011). Social media, as increasingly influential online platform, foster cooperation, reputation, trust, altruism and community identification, all of which create value for users and thereby increase their awareness, engagement, and loyalty (Chung & Hun, 2017; Dolan, Conduit, Fahy, & Goodman, 2016; Ho & See-To, 2018; Seraj, 2012; Zhang, Barnes, Zhao & Zhang, 2018).

The term "tourist flow" implies visitors' movements between different attractions (Vu et al., 2018), consisting of spatial and temporal patterns and reflecting tourism demand (Kim et al., 2022). Social media builds online popularity and reputation of destinations through eWOM, reviews and ratings, creating the sense of scarcity, which guide tourists' decision-making (Gössling, 2017; Reza Jalilvand & Samiei, 2012). Moreover, social media affects customer flows via glamorising travel consumption, foresting traveller identity, and encouraging competitive travel, fundamentally making mobility a socially desirable phenomenon (Gössling, 2017).

Research model and hypotheses

Drawing upon the Uses and Gratifications Theory (UGT), the current research assumes a social media-induced overtourism theoretical model (Figure 1). Tourists utilise social media for several purposes such as information seeking, entertainment, self-presentation, and socialisation. This behaviour satisfies tourists' various needs, including enjoyment, cognition, social identity creation, and the establishment of social ties, as evidenced by prior research. Furthermore, previous studies have empirically validated the significant roles of these gratifications in influencing user behaviours, particularly in terms of visit behaviours such as where and when to travel, known as tourist flows, which can lead to crowdedness in a particular arena. Once the number of arrivals exceeds the critical threshold of the place's carrying capacity, overtourism looms. Thus, this study hypothesises that social media usage leads to a concentration of tourist flow, triggering overtourism. Building on the proposed theoretical framework, the study formulates the following set of hypotheses:

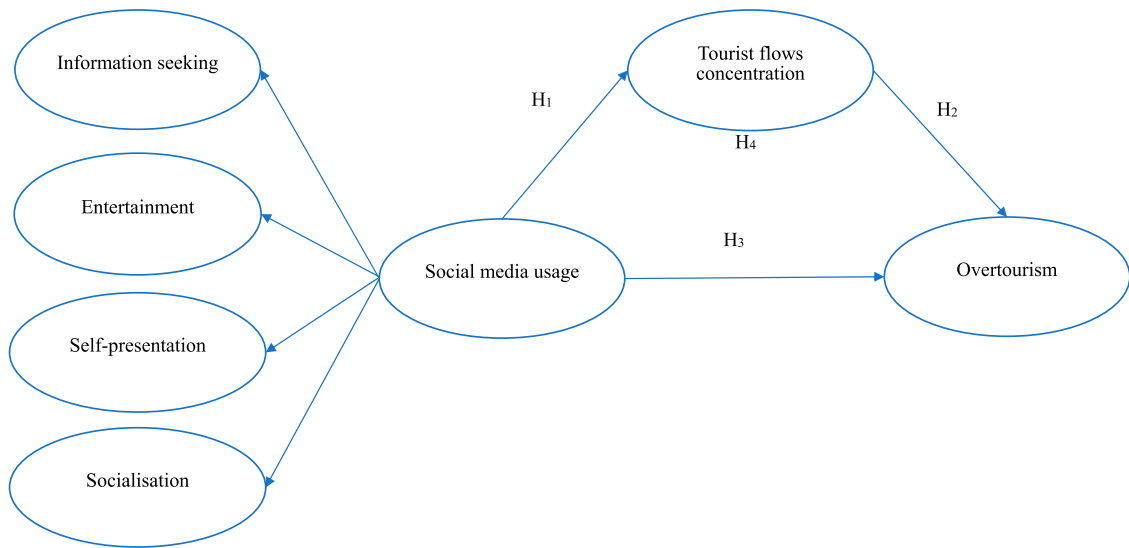


Figure 1. Hypothesised relationship between social media usage and overtourism.

Social media usage and tourist flow concentration

H₁: Social media usage has a positive impact on tourist flow concentration.

Kaplan and Haenlein (2010, p. 61) describe social media as “a group of Internet-based applications that build on the ideological and technical foundations of Web 2.0, and that allow the creation and exchange of user-generated content.” Social media is a broad term encompassing a variety of online sources of information that are created, shared and utilised by consumers for various purposes, such as informing each other about products, services, brands and promotions available in the market (Whiting & Williams, 2013).

Tourists utilise social media for numerous reasons including travel information searches (Xiang & Gretzel, 2010), which helps them make informed decisions (Ho & Gebsumbut, 2019), and sharing travel experience both during and after their holidays (Fotis et al., 2011). The information that travellers obtain on social media helps to reduce uncertainty by unfolding fresh facts about an intended destination, as it is directly produced by consumers who have practical, first-hand experience (Berhanu & Raj, 2020; Guo et al., 2017; Liu, Li, Ji, North, & Yang, 2017; Yoo, Lee, Gretzel, & Fesenmaier, 2009). Moreover, as UGC provides diverse information, facts and insights about destination attributes, it makes destinations more familiar to potential visitors creating a

destination impression depending on the information obtained (Kim & Fesenmaier, 2017; Liu et al., 2019). According to Alonso-Almeida et al. (2019), the provision of organic and accurate information about a new destination and its various attributes may place a destination in the spotlight and elicit a desire to travel, triggering further tourist flows. Furthermore, social media rankings claiming to appraise the “best”-rated spots and hospitality facilities are increasingly common, leading to more tourist flows. Another critical factor of social media usage’s contribution to tourist flow concentration is the hedonic benefits that tourists seek in their holidays and their urge to share their experience with friends on social media in real-time. Such shared evaluations of visited destinations and travel experiences may tend to be positive perceptions (Gretzel, 2018; Kim & Fesenmaier, 2017). This fact is strongly linked to individuals’ need to satisfy several personal and psychological needs such as social identity, reputation and altruism, as users are motivated to share more about their tourism experience to attract followers, get more compliments or become influential (Dijkmans, Kerkhof & Beukeboom, 2015; Gretzel, 2019; Lexhagen, Larson, & Lundberg, 2013; Wang & Bramwell, 2012). Therefore, self-presentation has become an integral part of social media usage pertinent to the tourism industry, helping to create a destination impression, determining the importance of the destination and thereby providing useful information for

destination management organisations (Gretzel, 2019). Self-presentation also motivates potential tourists to travel to the same destination, eventually creating destination management challenges such as congestion and overcrowding (Akgün et al., 2020; Taylor, 2020). In a similar vein, research shows that the use of social media as peer communication channel increases both narcissism and envy, stimulating tourists to travel to the same destination as their peers, which increases strain on the carrying capacity of destinations (Liu et al., 2018; Taylor, 2020).

Tourist flow concentration and overtourism

H₂: Tourist flow concentration has a positive impact on overtourism.

Tourist flow concentration refers to the concentration of tourists in a certain place at the same time, which is the major cause of overtourism (Peeters et al., 2018). The concentration of visitors in popular destinations due to expansion and massification of tourist flow creates crowded conditions, jeopardising the carrying capabilities of tourist destinations, and raising issues related to environmental sustainability (Capocchi et al., 2019). Furthermore, the concentration of visitor flow is a significant factor contributing to overtourism (Park & Kovacs, 2020). Therefore, the current study proposes that overtourism and tourist flow concentration would have a positive correlation in China.

Social media usage and overtourism

H₃: Social media usage has a direct and positive impact on overtourism.

Existing research considers social media as a driving force of overtourism. Social media fundamentally changes the tourism system by providing opportunities to search for tourism information, book holidays, rate, estimate, and get proposals. Social media also enables tourists to understand travel patterns and trends. Consequently, this has the concomitant repercussions of making underexplored and underrated locations suddenly become highly popular due to references on social media (Gössling, 2017; Butler & Dodds, 2022). As a catalyst for overtourism, social media intensifies tourists' motivation to travel to specific destinations identified as "best"-rated attractions by social media ranking. Such immediate popularity may lead to a sudden surge in tourist arrivals (Gretzel, 2019). These wide-ranging social media attributes accompanied by a

short-term growth mentality prevalent in most tourism development models of emerging destinations, contribute to the fact that overtourism is virtually inevitable. The third hypothesis, which suggests a direct positive association between social media usage and overtourism, is, therefore, established in line with the above discussion.

Tourist flow concentration, social media usage and overtourism

H₄: Tourist flow concentration mediates the relationship between social media usage and overtourism.

Overtourism occurs when tourist flow concentrates at a specific location, exceeding the "physical, ecological, social, economic, psychological, and/or political capacity thresholds" (Peeters et al., 2018, p. 19). Therefore, previous studies' measurement of overtourism at the destination level includes both tourism density and tourism intensity (Peeters et al., 2018). Social media shapes tourist flow by providing additional information, creating expectation, and developing social networks based on eWOM, reviews, rankings and ratings, as well as utilising social media attributes such as like and share features (Gössling, 2017; Falk & Hagsten, 2021). This leads to the formation of the final hypothesis of this study, which states that the relationship between the use of social media and overtourism is mediated by the concentration of tourist flow.

Research methodology

Tourism and social media usage in China

China's tourism sector has witnessed tremendous growth over the previous decades and has become an important pillar of the nation's social and economic development (Zhou, 2019). Chinese tourist arrival (national and international) is growing at a rapid pace, rising from 2,986 million tourists in 2012 to 6,028 million tourists in 2019, with a year-to-year growth rate of 9.7% (World Bank, 2020). Total tourism revenue also shows an exponential growth from 3.6 billion USD in 2012 to 9.2 billion USD in 2019, with an annual average growth rate of 11.1% (National Bureau of Statics of China, 2020). According to the UNWTO (2019), in 2018, China was the world's top tourism spender (277 billion USD), the fourth most popular destination for international tourist arrivals (63 million) and the tenth biggest tourism earner (40 billion USD).

Social media is widely used by Chinese tourists. In 2020 alone, 904 million people (64.5% of the nation's total population) in China used the Internet, an increase of 4.9% from 2018 (China Internet Network Information Center, 2020). Additionally, China's absolute growth rate of Internet users ranks second, and the growth rate of social media users ranks first among all countries (Global Digital Report, 2020). Recently, the number of online travel booking users has grown rapidly in the country reaching to 410.01 million in 2018 compared to 180.77 million in 2013. Its annual growth rate is 14.8% higher than the world's average annual growth of 10% (Online Travel Booking Statistics, 2020), indicating that 1 out of 3.5 Internet users uses online travel booking in China. Therefore, social media play a crucial role before, during, and after Chinese tourists' holidays.

Overtourism in Hangzhou

Hangzhou, as the provincial capital of Zhejiang, is situated in southeast China (Figure 2). As the second-largest city in the Yangzi River Delta, Hangzhou is 180 km away from Shanghai and is located at the intersection of the Silk Road Economic Belt and the twenty-first Century Maritime Silk Road. Hangzhou is known as "the Land of Fish and Rice" and "Paradise

on Earth," with a variety of natural panoramas, hills, and water bodies (65.6% of the territory is hilly while 8.0% is water). The city also served as the Southern Song Dynasty's capital from 1127 to 1279. As an international metropolis it also hosted the G20 summit in 2016. Hangzhou's unique geographical features and rich history make the city one of the most renowned tourist destinations in China, with a spectacular natural landscape within its vicinities (e.g. the West Lake Heritage, inscribed on the World Heritage Site in 2011), ancient historical and cultural legacies (e.g. Hefang Street) and traditional urban landmarks (e.g. Wulin Square).

As one of the most prestigious tourist destinations in China, tourism is growing rapidly in Hangzhou leading to overtourism, a contemporary tourism challenge faced by many other popular tourist destinations as well (Min, 2018; Qian, 2015; Wang & Bramwell, 2012; Zhang & Lenzer, 2020). As Table 1 shows, tourist arrivals (international and domestic combined) in Hangzhou increased from 16,287 million in 2017 to 20,813.7 million in 2019, with a 13.1% annual growth rate. Its total tourism revenue was 5.70 billion USD in 2019, with a growth of 18.3% over the previous year (Hangzhou Statistical Bureau, 2019).

Along with its growth, tourism brings challenges related to overtourism such as limited carrying



Figure 2 #Study area (Xinhua, 2019).

Table 1. Growth of Hangzhou population and tourists (2017–2019).

Year	Urban size (km ²)	Inhabitants (10,000 persons)	Tourist arrivals (10,000 person-times)	Growth in tourist arrivals	Visitors per resident	Visitors per km ²
2017	8000	824.1	16287	13.1%	19.8	20,358.8
2018	8289	857	18403		21.5	21,764.1
2019	8289	911.9	20813.7		22.8	25,110.0

Source: Hangzhou Statistical Bureau (2019).

capacity (Qian, 2015), irresponsible behaviour by tourists (Min, 2018), congestion and over-commercialisation (Wang & Bramwell, 2012; Zhang & Lenzer, 2020), and pollution (Bastiaansen et al., 2020). Additionally, as can be seen in Table 2, Hangzhou is characterised by a high risk of overtourism. Tourist arrivals grew by 13.1% annually on average between 2017 and 2019, exceeding the city's threshold (>7.7%) tourist resident ratio (22.8 in 2019), higher than the top quintile (>5.3). However, its tourism density (25,110 in 2019) is less than the fifth quintile (<75,000) (Capocchi et al., 2019; Park & Kovacs, 2020). Furthermore, Hangzhou was identified as one of the four hotspot areas in China where inbound and domestic tourist flow was polarised between 1999 and 2006 (Yang & Wang, 2012). The UNWTO (2018) report highlights that Hangzhou has experienced overtourism in recent years. For these reasons, Hangzhou provides an ideal opportunity to investigate the connection between social media usage and overtourism as a research context in the current study.

Instrument development

The measurement model (Figure 3) was assessed using a combination of first and second-order models. Information seeking, entertainment, self-presentation, socialisation, tourist flow concentration and overtourism were measured using the first-order model, and social media usage was measured using the first-order variables, introducing a second-order model. Four information-seeking, entertainment, and socialisation items and five self-presentation items were adapted from earlier research (Hsu et al., 2015). Seven tourist-flow concentration items

came from Gretzel (2019) and Huettermann et al. (2019). Finally, this study operationalises the concept of overtourism through seven items from Peeters et al. (2018). All items used a 7-point Likert scale with 1 representing “strongly disagree” and 7 “strongly agree.” The questionnaire was developed first in English. Following the back-translation method, two bilingual translators translated the questionnaire into Chinese. Then, an expert evaluation was conducted followed by a pilot study.

Data collection

We adopted a stratified sampling technique and varied survey days to lower potential sampling bias. Equal numbers of female and male domestic tourists to Hangzhou were earmarked for the survey, with a total of 300 intended respondents. This approach was crucial due to considering gender as a stratified variable to allow detailed analysis of the aspects pertaining to social media usage of both genders. Given the number of planned respondents, tourists were intercepted at given time intervals to complete the questionnaire (Tassiopoulos & Haydam, 2008).

Paper questionnaires in Chinese were distributed to available Chinese domestic tourists at the main local attractions in Hangzhou, including the West Lake Heritage, Hefang Street, and Wulin Square, during the peak seasons of August 2019 and 2022. Even during COVID-19, Hangzhou's domestic tourist numbers remain at a high level, especially during the summer holiday, with 6.68 million domestic tourist arrivals in 2019 and 6.4 million in 2022 (Hangzhou Culture and Tourism Data Online, 2023). Except for the summer holiday, which is the traditional travel season, two other reasons contribute to visitor flows

Table 2. Benchmarks for cities to assess overcrowding risk.

	Top quintile (high risk)	Second quintile	Third quintile	Fourth quintile	Fifth quintile (low risk)
Growth in tourist arrivals	>7.7%	6.2–7.7%	4.0–6.1%	2.0–3.9%	<2.0%
Number of visitors per square kilometre	>930,000	475,001–930,000	200,001–475,000	75,000–200,000	<75,000
Number of visitors per resident	>5.3	2.8–5.3	1.8–2.7	1.0–1.7	<1.0

Source: WTTIC, McKinsey and Company (2018).

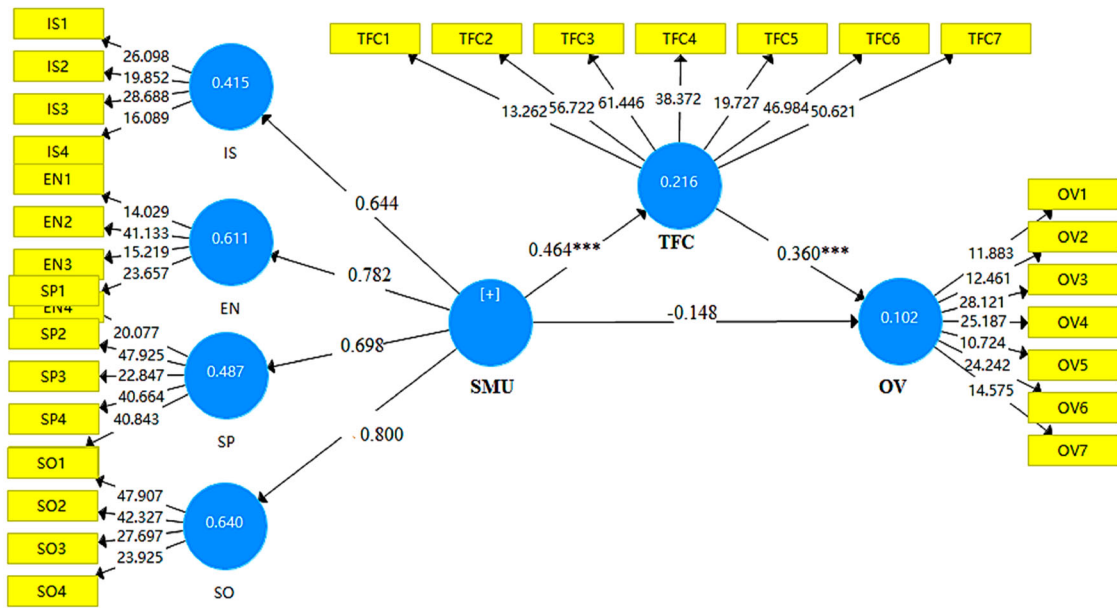


Figure 3. Factor loadings and path coefficients (PLS algorithm estimates).

to Hangzhou. First, COVID-19 is a seasonal low-temperature infection, as suggested by a uniform summer recession across countries (Fontal et al., 2021). For example, according to the Chinese Centre for Disease Control and Prevention (2023), there were 17,444 confirmed cases in July and August 2022, accounting for 4% of the total for 2022 (total 417,615 confirmed cases). Second, the Chinese government has implemented precise measures in epidemic prevention and control (i.e. segregation policy for clear gradient division), emergency disposal (i.e. accurate delineation of the hierarchical control circle of infected people), and timely, transparent, and accurate information release (Ma, 2022). In addition, Boto-García and Mayor (2022) demonstrate that destinations with a larger share of domestic tourist demand are more resilient to the epidemic effects. Hangzhou’s domestic tourism reaches up to 90%, which is of great importance in mitigating the pandemic shock. The same phenomenon happened in Wuhan (Liu et al., 2023). A recent marketing report identifies Hangzhou as a top destination in the summer of 2022 (China Tourism Academy, 2022). Therefore, despite the pandemic, Hangzhou has been experiencing significant domestic tourist arrivals, especially in 2022.

Potential respondents were invited to complete questionnaires as they passed along in the survey sites. Twelve undergraduates were trained and

worked as data collectors. The respondents were identified as leisure visitors using a screening question. 321 informants were invited to participate in the survey, while 86 of them rejected the invitation, 26 of them returned an incomplete survey. After data cleaning with SPSS, 209 responses were used for analysis (65.1% response rate).

Table 3. Respondents profiles.

Characteristics	Frequency	Percentage (%)
Gender		
Female	118	56.5
Male	91	43.5
Age		
18–24 years	34	16.3
25–34 years	84	40.2
35–44 years	70	33.5
45–54 years	16	7.7
>55	5	2.4
Marital Status		
Married	134	64.1
Single	71	34.0
Other	4	1.9
Education		
High School	6	2.9
Diploma/Higher Diploma	20	9.6
Bachelor	99	47.4
Master and above	77	36.8
Other	7	3.3
Employment		
Employed	130	62.3%
Unemployed	79	37.7%
Total	209	100

Respondents consisted of 56.5% female and 43.5% male. And most of them belong to the 25–34 years (40.2%) and 35–44 years (33.5%) age category. 64.1% of the respondents were married, while 34% were single. The largest group (47.4%) of the sample, hold a bachelor's degree, whereas 36.8% have a master's or higher degree. Finally, 62.3% of the respondents are employed while 37.7% are unemployed (Table 3).

Data analysis process

This study employs a partial least squares structural equation modelling (PLS-SEM) to analyze the data. CB-SEM (Covariance-based structural equation modelling) uses common factors to explain the covariation of a set of indicators. Compared with CB-SEM, PLS-SEM is a partial information method that utilises weighted composites of a group of related indicators as proxies to represent the associated construct. Additionally, CB-SEM is a statistical technique that evaluates the fit of a proposed model to a given covariance matrix of a sample data set and assists to maximise the variance of a target construct (Hair et al., 2019). PLS-SEM applies an iterative algorithm to estimate the parameters with least squares regression after calculating the weighted composite variables scores to minimise the residual variance (i.e. error terms). Consequently, PLS-SEM has a more predictive power compared to CB-SEM. Besides, compared to CB-SEM, PLS-SEM has a factor determinacy. Therefore, PLS-SEM is suitable for research objects such as theory development and variance explanation of endogenous constructs (Becker, Klein, & Wetzels, 2012). Other advantages include that PLS-SEM is helpful with complex models, small sample size and with data set that does not satisfy normal distribution (Cassel, Hackl, & Westlund, 1999). The goal of the present research is to determine the extent to which social media usage contributes to overtourism (i.e. examine if social media usage is a better predictor of overtourism, focusing on the nature of prediction). As a result, we chose PLS-SEM to adequately accomplish the study objectives. Additionally, Based on Kock and Hadaya (2018), 209 is a sufficient sample size because it fits the PLS's "10-times SEM's rule," which confirms that the sample size is at least equal to 10 times the maximum number of internal- or outer-model linkages pointing to any construct in the model.

Data analysis follows Hair et al.'s (2019) recommendations, such as guidelines, procedures, and critical

values. First, we assessed the measurement model to ascertain the reliability and validity of latent variables according to internal consistency reliability, indicator reliability, convergent validity, and discriminant validity. Then, we establish the structural model to verify the hypotheses developed via coefficients of determination.

Results and findings

Tourism activities characteristics

Tourist patterns in Hangzhou is shown in Table 4. Regarding the visit frequency, most respondents have been there more than one time (50.2%), while first-time visitors account for 49.8%. In terms of visit purpose, 52.2% of the respondents' main objective is travel for sightseeing and tourist attractions. Other visitors travel for holiday (22.5%) and business purposes (21.1%). The analysis of visit purposes indicates that high reputation is most common (43.1%), followed by convenience (32.5%). In terms of travel companions, travelling with families accounts for a higher proportion (54.5%), which is consistent with the reality that family tourism accounts for a large segment of the tourism economy in popular tourist destinations (Schänzel & Carr, 2016).

Table 4. Features of Hangzhou tourism.

Features	Frequency	Percentage (%)
Visit frequency		
Only once	104	49.8
Twice	72	34.4
Greater than twice	33	15.8
Travel objectives		
Sightseeing/city touring	109	52.2
As part of a holiday	45	21.5
Business	44	21.1
Visiting friends and relatives	33	15.8
As part of a visit to another nearby destination(s)	31	14.8
A day out	20	9.6
Shopping	7	3.3
Visit motivation		
Desire to visit a specific touristic area	90	43.1
Convenience	68	32.5
Desire to a return visit	40	19.1
Word-of-mouth endorsement	33	15.8
Marketing campaign	22	10.5
Travel companions		
Family/relatives	114	54.5
Friend(s)	74	35.4
Alone	34	16.3
Tour	9	4.3

Table 5. Tourists' social media utilisation with overtourism.

Constructs/Items	Mean	Standard deviation
Social media usage (SMU) (2nd order factor)		
Information seeking (IS)		
1. I utilise social media to discover up-to-date tourism information.	5.97	1.098
2. I utilise social media to discover messages from friends simply.	5.62	1.318
3. I utilise social media to stay up to date on current events and news.	6.14	1.014
4. I cannot use social media to find the information I need.	5.72	1.161
Entertainment (EN)		
1. Using social media helps me pass time.	5.12	1.576
2. I feel at ease when I use social media.	5.30	1.279
3. Using social media helps me escape from the ugliness of life.	4.61	1.652
4. It brings me joy to use social media.	5.58	1.328
Self-presentation (SP)		
1. I regularly update my social media profiles.	3.51	1.693
2. I use social media to routinely publish personal information and details about my life.	3.56	1.686
3. I use social media to share my thoughts.	3.82	1.702
4. I often express myself on social media to let others get to know me better.	3.51	1.699
5. I share private information on social media to boost my self-esteem.	3.71	1.730
Socialisation (SO)		
1. I have a community of friends on social media.	4.79	1.475
2. I can more easily keep in touch with my friends thanks to social media.	5.30	1.352
3. I utilise social media to reconnect with friends I had lost contact with.	5.18	1.504
4. Social media is an effective way to interact with others.	5.77	1.150
Tourist flow concentration (TFC)		
I chose and travelled to Hangzhou mostly because:		
1. It is the most popular destination on social media.	4.73	1.668
2. Online influencers' recommendations.	4.14	1.758
3. Online posts about the place generate a lot of "likes," comments, and shares.	4.14	1.669
4. I must share travel-related information on social media that is engaging, passionate, exhilarating, and informative.	4.19	1.748
5. A lot of friends share their vacation experiences on social media.	4.34	1.756
6. It has a high reputation on social media.	4.02	1.825
7. There are many "instagrammable" spots there.	4.34	1.728
Overtourism (OV)		
During my visit to Hangzhou,		
1. I noticed that the pricing was higher, yet the service quality was superb.	4.11	1.590
2. I encountered large lines and significant wait periods.	4.22	1.605
3. I discovered significant pollution issues	3.37	1.671
4. I encountered congestion and overcrowding, such as traffic jams and	3.89	1.676

(Continued)

Table 5. Continued.

Constructs/Items	Mean	Standard deviation
overcrowding in public spaces, stores, restaurants, and sights, among other things.		
5. I found the folks to be hostile.	3.15	1.543
6. I discovered reckless tourist behaviour, such as congestion caused by selfie-takers and major damage to cultural monuments, among other things.	3.56	1.634
7. I believe Hangzhou is overrun with tourists.	4.13	1.606

Visitors' social media usage with overtourism

Table 5 displays how visitors perceive social media with overtourism. We ask participants to score their use of social media on a 7-point Likert-type scale. The findings indicate that Chinese visitors primarily use social media to seek information. Consistent with existing literature, mass Chinese visitors do not present themselves mainly through social media. In terms of tourist flow concentration, social media influence Chinese tourists' destination selection slightly. Finally, the high wait times, long lines, and low cost-performance ratio are among the indicators that most respondents believe Hangzhou has become overcrowded with tourists. However, findings show that the concentration of tourists has not yet reached the antagonistic level, as indicated by Doxey's (1975) irritation index, since the significance of variables such as local attitudes, environmental concerns, and unethical visitor behaviour are quite negligible currently.

Model assessment

Measurement model

The Reflective Measurement Model Assessment (RMMA) evaluates the reliability of indicators, convergent validity, internal consistency reliability and discriminant validity of latent variables by means of Cronbach's Alpha, Outer Loading, Average Variance Extracted (AVE) and Composite Reliability (CR). In the current study, all Cronbach's alpha and CR values used to measure the internal consistency of constructs exceeded the required threshold (i.e. Cronbach's alpha 0.6–0.7; CR 0.7), indicating that all these constructs have a high level of internal consistency (Chin, 2010; Hair, Sarstedt, Matthews, & Ringle, 2016). Most of the indicator's outer loadings for Convergent validity are significantly greater than 0.70, and the average variance recovered from each

Table 6. Measurement model assessment results.

	Outer loading	Cronbach's alpha	CR	AVE
IS		0.793	0.866	0.618
IS1	0.827			
IS2	0.767			
IS3	0.824			
IS4	0.723			
EN		0.758	0.847	0.582
EN1	0.763			
EN2	0.840			
EN3	0.696			
EN4	0.743			
SP		0.894	0.922	0.704
SP1	0.756			
SP2	0.889			
SP3	0.805			
SP4	0.882			
SP5	0.857			
SO		0.775	0.858	0.606
SO1	0.610			
SO2	0.872			
SO3	0.829			
SO4	0.777			
TFC		0.937	0.949	0.729
TFC1	0.718			
TFC2	0.899			
TFC3	0.913			
TFC4	0.879			
TFC5	0.795			
TFC6	0.885			
TFC7	0.872			
OV		0.922	0.938	0.683
OV1	0.837			
OV2	0.842			
OV3	0.841			
OV4	0.885			
OV5	0.748			
OV6	0.845			
OV7	0.766			

construct is higher than 0.5, indicating suitable levels of convergent validity. Although the indicators EN3 (0.696) and SO1 (0.610) are less than 0.70, CR and AVE values for the items are higher than the expected threshold value (Table 6). Thus, it is unnecessary to remove the two indicators (Rasoolimanesh, Ringle, Jaafar, & Ramayah, 2017).

The discriminant validity assessment applies the HTMT criterion. As can be seen in Table 7, all HTMT

values between constructs are less than 0.85, implying the establishment of adequate discriminant validity based on $HTMT_{0.85}$ (Henseler et al., 2015). However, the discriminant validity between EN, IS, SO, and SP and their higher-order component SMU is expected because the measurement model of SMU (as a higher-order construct) repeats the indicators of its four lower-order constructs (i.e. EN, IS, SO, and SP). In addition, the repeated indicators of the SMU construct are only included for identification and do not stem from a unidimensional domain. This means discriminant-validity assessment for these relationships is not relevant (Sarstedt et al., 2019).

Structural model

Structural model assessment considers construct collinearity, hypothesis testing, and prediction ability. The highest variance inflation factor value for the current structural model is 2.437, which is significantly less than the critical threshold of 5. Thus, the model does not have a multicollinearity issue. Additionally, Smart-PLS 3 is used to do the bootstrapping hypothesis testing. Table 8 demonstrates that social media usage (SMU) has a positive and significant impact on visitor flow concentration (TFC). Since the route coefficient is 0.464 ($p < 0.01$), H_1 is, thus, accepted. TFC also significantly contributes to overtourism (OV), revealing a high path coefficient value (0.360) between them ($p < 0.01$); hence, the result supports H_2 . However, SMU has no discernible impact on OV, as the t value (1.782) is smaller than 1.96. The analysis also reveals that, with a determination coefficient of 0.167 ($p < 0.01$), TFC serves as a full-indirect mediator for the link between SMU and OV. But the direct effects of SMU on OV (i.e. H_3) are not significant. Finally, since Beta is 0.019 ($p > 0.1$), the total effect of SMU on OV, as the combination of the direct and indirect effects, is not statistically significant. Therefore, the social media usage – overtourism model developed in this study is an indirect-only full mediation model that demonstrates how tourists

Table 7. Discriminant validity (HTMT).

	EN	IS	OV	SMU*	SO	SP	TFC
EN							
IS	0.646						
OV	0.134	0.091					
SMU*	–	–	0.134				
SO	0.637	0.529	0.095	–			
SP	0.457	0.160	0.095	–	0.568		
TFC	0.457	0.269	0.234	0.540	0.404	0.495	

Note:* represents the high order construct.

Table 8. Hypothesis-testing results.

#	Hypothesis	Beta	Confidence interval	t-value	p-value	Decision
H ₁	SMU → TFC	0.464***	[0.348, 0.570]	8.002	0.000	Supported
H ₂	TFC → OV	0.360***	[0.214, 0.520]	4.656	0.000	Supported
H ₃	SMU → OV	-0.148	[-0.311, 0.010]	1.982	0.105	Unsupported
H ₄	SMU→TFC→OV	0.167***	[0.093, 0.266]	3.762	0.000	Supported
	SMU→ OV (Total effect)	0.019	[-0.135, 0.167]	0.247	0.805	Unsupported

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

use social media as inspiration to book trips to popular tourist destinations. In turn, this helps to concentrate the tourist flow and consequently results in overtourism. Additionally, endogeneity assessment uses the Gaussian copula approach for PLS-SEM (Hult et al., 2018). The copula terms are not significant for any of the coefficients in the structural model, indicating that endogeneity had no impact on the outcomes.

Regarding its predictive power, OV has an R^2 value of 0.102 (< 0.25), which is weak (Hair et al., 2011). This shows that social media usage, expedites tourist flow, eventually leading to overtourism although its effect is weak. In addition, socialisation is the most highly associated construct with social media usage with 0.800 path coefficient, followed by entertainment (0.782), self-presentation (0.698) and information seeking (0.644) (Figure 3).

Discussion and conclusion

This research develops a social media-induced overtourism model to explain how social media usage contributes to overtourism by stimulating tourist flow concentration. Additionally, it provides empirical data to further test the extent to which the four motivation factors contribute to overtourism and to compare their relative contributions. Findings suggest that social media usage has a positive impact on tourist flow concentration leading to the acceptance of H₁. Hangzhou enjoys a high online reputation (TFC1 4.73), as one of the most popular holiday destinations in China. This is consistent with Peeters et al. (2018) which argues that travellers choose the “best” destination according to online rankings, resulting in tourist flow concentration. Additionally, entertainment-driven content on social media (e.g. videos) inspires tourists to travel to Hangzhou for escapism, enjoyment, and rejuvenation. This finding strengthens Tussyadiah and Fesenmaier (2008) who claim that watching videos of travel experiences posted online can provide viewers with

mental pleasure by instilling fantasies and daydreams as well as recalling memories of the previous travel. Thus, social media serves as narrative transportation, enabling users to access unfamiliar landscapes and socioscapescapes and stimulating travel desire.

Additionally, shared images of real tourism experiences motivate tourists to travel to Hangzhou. Tourists tend to create breathtaking images of destinations and share them with social media audiences to convey their travel experiences across the online community. This strengthens the findings of Lo and McKercher (2015), whereby tourists create, select and post ideal images of their tourism experiences to impress their social media audiences. In this way, socialisation has a favourable impact on tourist flow concentration. The current research also shows that seeking social status motivates tourists to travel to Hangzhou because it is a prominent tourist destination. This corresponds to several other studies which highlight that social identity, reputation, persuasive communication, and peer influence inspire tourists to travel to certain destinations (Gretzel, 2019; Liu, Wu & Li, 2019; Shareef et al., 2020; Taylor, 2020; Wang, Yu, & Wei, 2012). Similarly, Wang et al. (2012) assert that bond strength and peer group identification in social media positively affect decision-making behaviour. Conversely, the current study contradicts the view of Lexhagen, Larson and Lundberg (2013) that social identity has no influence on tourists’ travel intentions. Furthermore, the envy and narcissism endemic to social media ignite social comparisons in the online community and encourage more travel to exotic destinations, in pursuit of more fame as discussed by Taylor (2020) and Liu et al. (2018).

Furthermore, to make a well-informed judgement, visitors heed advice from the online travel community when it is backed up by trust, source credibility, and network externality (Shareef et al., 2020). Gretzel (2019) discussed this as well, asserting that social media users frequently visit internet celebrity spots to establish reputation, feel intimately connected to

their influencers and viewers, and eventually gain acceptance.

Secondly, the current study asserts that tourist flow concentration positively influences overtourism; thus, H₂ is supported. Long lines and wait periods to visit various sites are some of the indicators respondents characterise their encounters with overtourism in Hangzhou (OV mean 4.22). Such tourist experiences demonstrate the effect of visitor flows triggering overcrowding which leads to overtourism. This finding is consistent with Mihalic (2020) and Capocchi et al. (2019). The aforementioned authors justify that overtourism occurs due to factors such as high tourism growth, the concentration of visitor flows, and poor visitor management, which threatens the resilience of destinations.

Thirdly, this study suggests that social media usage does not significantly impact overtourism; thus, it rejects H₃. Therefore, social media are not the primary cause of overtourism, nor do they have an inherent role in its perpetuation. It consolidates the findings of Gretzel (2019) that only when combined with other variables can social media behaviour effectively lead to overtourism. The explanation for this might contain more than one way regarding Chinese social media users. It may be because Chinese social media users tend to share social media content very selectively and places that are already overcrowded may not be shared by them, so that users have little impact on destinations' carrying capacity and further overcrowding. It may also be because social media as tools to avoid overcrowded destinations appearing to be popular online, leading to circumventing them or visiting them at off-peak periods. Existing literature supports the findings, which state that social media significantly contribute to the promotion of ecologically responsible behaviour, the dispersal of tourists, public education, and the advancement of destination management strategies (Murphy et al., 2018; Zygmunt, 2018). It is also worth noting that primary data generated from Chinese tourists have deviated from existing theoretical underpinnings. Wondirad and Agyeiwaah (2016) expose a similar situation in which Chinese tourists' demand for travel to Hong Kong continually increases regardless of price increases at the destination, which violates the well-established economic theory of supply and demand. As Casaló et al. (2011) discussed, the intention to emulate the behaviour displayed in social media significantly depends on some factors, such as perceived usefulness, trust, and personality

traits like susceptibility to interpersonal influence. Therefore, in an environment where social media usage is highly regulated, potential tourists may perceive online content as having low usefulness and less dependable. Reasonably, the crowdedness of tourist destinations is subjective and relative, depending on several contextual factors such as nationality, personality, physical characteristics, activity types and the types of perceived crowding (Cheng et al., 2021). And Chinese people have become accustomed to space congestion and have a higher tolerance for crowdedness. In support of this, Jang and Park (2020) point out that overtourism does not manifest in a uniform manner across destinations. Additionally, Hangzhou Municipal Government increases visitor arrivals and disperses visitors by progressively developing new visitor itineraries and attractions (Song & Abukhalifeh, 2021).

Fourthly, research findings disclose that tourist flow concentration fully mediates the connection between social media usage and overtourism, supporting H₄. This highlights the functions of social media in the travel-related goals of visitors, such as receiving tourism-related information, developing self-empowerment, and raising awareness. By engaging with social media content about tourism destinations, tourists can enhance their understanding of the features and attributes of those destinations, potentially increasing their travel demand, broadening their travel horizons, and resulting in a concentration of tourists in certain areas as a result. Scholars have examined the role of social media as a facilitator of information and knowledge exchange, which helps visitors feel confident, become more familiar with the destination, and form a perception of it. This situation, in turn, can lead to an increased concentration of tourist flow in certain places, resulting in overtourism (Marrocu & Paci, 2013; McKercher & Lew, 2004; Zeng & He, 2019).

Socialisation, with a path coefficient of 0.80, has a greater impact on overtourism than entertainment, self-presentation, and information-seeking, through the mediating effect of tourist flow concentration. The more tourists utilise social media to reflect on and disseminate their experiences, the more they motivate potential visitors to travel to such destinations. This increases the possibility of overtourism. However, it should also be noted that the latent variables in the current model (social media usage and tourist flow concentration) only account for 10.2% of the variance in overtourism ($R^2 = 0.102$), which is

poor (Hair et al., 2016). The findings imply that social media use is not a major cause of overtourism. Nevertheless, depending on context and discipline, an R^2 value of 0.10 may be deemed acceptable (Hair et al., 2019). The current findings reinforce the arguments made by Alonso-Almeida et al. (2019), who underline that while social media undoubtedly inspires behaviours that could result in crowding and sustains images that attract people to visit certain locations, it is neither the sole contributing element to overtourism nor its primary factor. Furthermore, some researchers have recognised ineffective visitor management as the root cause of overtourism, as evidenced by the poor timing among cruise lines in their embarkations and disembarkations in Barcelona, for example (Ros Chaos et al., 2018; Vayá et al., 2018). This shows that although social media might create an increase in tourists, which can lead to overtourism, as it did in the current study, it is not the sole factor responsible.

In conclusion, overtourism is a complex problem with many contributing factors. To properly understand and overcome these issues, destinations must embrace sustainable development practices that contain modern visitor management strategies (utilising technology), and diversifying tourist attractions to disperse tourists (Kebete & Wondirad, 2019; Pechlaner et al., 2020). As per our findings, it is reasonable that although social media usage is responsible for overtourism, it is not a critical enabler. On the contrary, the underlying drivers of overtourism appear to be rooted in other matters such as unconstrained tourism growth, poor visitor management, seasonality and other destination development, management and governance issues (Clancy, 2020; Dodds & Butler, 2019b; Pechlaner et al., 2020; Ros Chaos et al., 2018). Therefore, adopting a sustainable tourism development model and improving visitor management practices are crucial tools for creating and maintaining a reciprocal appreciation and respect between visitors and local communities. Effective visitor management involves providing clear information about the place, setting appropriate rules and regulations, and providing a range of services and amenities to make visitors' experiences enjoyable. It also involves monitoring visitor numbers and controlling how they affect the environment. In this vein, there is considerable potential for an immediate intervention mechanism, as exemplified by a proper visitor management approach, and a resilient tourism development model.

Some scholars (Almeida-Santana & Moreno-Gil, 2017; Gössling, 2017; Gretzel, 2019; Zygmunt, 2018) point out that social media affects tourism in multiple and complex ways, with mixed consequences for sustainability: some create overtourism, and some address the unsustainable tourism. Social media could have a far more considerable role in promoting responsible tourism behaviours by supporting identity construction, gamification, and using social media influencer power to create awareness about travelling responsibly. Social media also can disperse tourists away from the hot spots through a recommender system. Furthermore, this study has shown that visitor-generated content is a valuable source of data to identify overtourism in destinations, where DMOs can develop an early warning system using big data.

This study introduces the Uses and Gratifications Theory to investigate the connections between social media usage, tourist flow concentration, and overtourism. It confirms that social media usage contributes to overtourism through the mediating effect of tourist flow concentration, but it is not the primary cause. This is because the developed model only accounts for 10.2% of the variation in overtourism, suggesting a weak effect of social media usage on overtourism. In terms of theoretical contributions, firstly, this research attempts to empirically establish a link between social media usage and overtourism primarily from visitors' perspective instead of residents' views unlike existing research. This is arguably the first time to test social media's role in contributing to overtourism based on empirical data in the Chinese tourism context where findings confirm the existence of a positive correlation between social media usage and overtourism. Despite the research context is Hangzhou, China, research findings have global implications as overtourism is a current issue in the tourism sector internationally. Secondly, this study advances overtourism research by introducing the Uses and Gratifications Theory, which identifies four types of social media gratifications that significantly and distinctly contribute to visitors' perceived overtourism mediated by tourist flow. Particularly, socialisation and entertainment are two salient factors in aggravating overtourism. This progress occurs as social learning (such as imitation), network externalities, and peer influence concentrate tourist flow, leading to overtourism. Thirdly, the study extends the Uses and Gratifications Theory into the context of overtourism and contributes to media

impacts research. The research proves that social media acts as a trigger and catalyst of overtourism, fully mediated by tourist flow, confirming the limited effects of social media. Generally, mass communication does not serve as a necessary and sufficient cause of audience effects; instead, it works among and through a nexus of mediating factors and influence (Klapper, 1960). In other words, social media contributes to overtourism along with other factors such as the unconstrained growth of tourism (Butler & Dodds, 2022).

Practically this paper shows that social media have significant implications for addressing overtourism. Several critical suggestions can emerge from the current study for pertinent destination stakeholders. First, a wealth of social media data can contribute to establishing a series of indicators to accurately predict tourist flows and develop a systematic and efficient visitor management system. Researchers have suggested using geotagged and posts-time data to identify hot spots. However, there is a considerable shortage in taking advantage of social media data. For instance, destinations can analyse text and images on social media to better understand tourists' travel pattern, such as visitors' activity types, activities sequence, and factors influencing travel patterns, and predict travel behaviours (Chen et al., 2022). Second, socialisation as an educational function warrants closer attention from practitioners. Destination management organisations (DMOs) can leverage social relationships to promote sustainable behaviours or brands. For example, DMOs can offer green tourism packages and demonstrate sustainable consumption patterns to stimulate interpersonal communication about responsible behaviours on social media. More importantly, DMOs can encourage tourists to share their experiences consuming green tourism offerings in online communities, such as WeChat friend circles, to maximise peer effects. By analysing audience engagement on social media, DMOs can better understand real-time consumer opinions.

In addition, this study makes an intriguing discovery about Chinese tourists' self-presentation and social media use. Findings show a low mean score, revealing that Chinese tourists engage in social media not mainly for self-promotion but for information searches, entertainment, and socialisation (Table 5). Given this, DMOs may take advantage of social media as a powerful destination marketing tool to reach target markets effectively. Therefore,

the current study makes substantial contributions to the existing body of knowledge by shedding light on the less-explored research area of social media-induced overtourism in a unique yet influential research setting, both as an international tourist destination and as an exponentially growing global source market.

The main limitation of this study emanates from the conceptualisation of overtourism. This is because as the term overtourism itself is a complicated and multifaceted phenomenon, the definition of overtourism remains obscure largely due to its relative and contextual nature. The absence of overtourism indicators for destinations causes the validity issues of the measurement of overtourism. One avenue for future research is to focus on the development of robust overtourism indicators for tourist destinations. Despite domestic tourist arrivals in Hangzhou remaining high, the tourism industry was still adversely affected by the COVID-19 pandemic, which we would like to acknowledge as a limitation. This limitation could challenge the validity of the result of Hypothesis 3. Therefore, future studies could consider collecting fresh and comprehensive data after the pandemic to validate the current research findings.

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