EXAMINING THE EFFECT OF AIRPORT ENVIRONMENT ON PERCEIVED IMAGE, MEMORABLE EXPERIENCES AND PASSENGER RELATIONAL BEHAVIOURS

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ABSTRACT

This study aims to explore air passengers' relational behaviours in terms of advocacy and openness by considering the overall airport environment, perceived image, and memorable experience in the context of international airports. The data was gathered from 879 respondents who are experienced airport users. This study employs partial least squares structural equation modelling (PLS-SEM) to verify the validity and accuracy of the research model. The overall airport environment was established with the second-order formative construct of six dimensions, namely, information and layout, terminal ambience, security, passenger facilities, gate area, and leisure and entertainment. Findings enhance knowledge of the formation process of airport image and memorable travel experience and provide insights into tourism and airport literature, particularly from the perspectives of air passengers. This study also discusses practical implications.

INTRODUCTION

With the growing competition in the tourism and air transport industry, an increasing significance exists wherein airports must form and provide memorable travel experiences to air passengers to boost their competitiveness in the market (Wattanacharoensil et al., 2022). When selecting an airport to transfer from/to a destination, travellers typically use internal information from their travel experiences as the first referencing point in the information search process (Kim, 2014; Wattanacharoensil et al., 2017). In airport studies, similar to other tourism contexts (Kim, 2014; Zhang et al., 2018), memorable experience is regarded as a benchmark that determines passengers' satisfaction and attitudes towards an airport. As

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stated by Zhang et al. (2018), memorable experience is among the underlying variables that best represents perceptions and predicts future behaviours of tourists.

Prior tourism literature primarily emphasised the core elements and structure of memorable experience and established memorable travel experience dimensional scales (Kim, 2014; Tung & Ritchie, 2011a). Memorable experience components in current research also largely depend on a specific context, like destination (Zhang et al., 2018). Researchers request further examination that expands the knowledge of memorable experience in an uninvestigated context to explore the causes and nomological validity of the construct (Kim, 2014; Zhang et al., 2018). In the airport literature, studies on memorable experience are found to be limited in scope (Wattanacharoensil et al., 2017). Prior works showed an incomprehensive relationship of how airport environment dimensions influence memorable experience, although it would contribute to the airport literature.

In prior research, the importance of passenger experience, perceived image, and behaviour intention has been focused (Park & Park, 2019). However, no study has yet empirically explored the effects of service environment and image on memorable airport experience (MAE) (Wattanacharoensil et al., 2022). Since the emergence of COVID-19 pandemic, there exists to be various airport operational issues, particularly those related to performance, new technology adoption, and health and safety of passengers. Recently, the continued surge of oil prices has also affected the airport and airline operations in many countries (Samanta, 2022). More evidence demonstrates that passengers have often been disappointed with unorganized airport layout and not-useful information provided by airports (Fakfare et al., 2021a). As a result, airport users have required a better airport experience with a more agreeable airport environment (e.g., updated flight information, modern technology and more control of the processes) when they visit the airport for an air transfer. Therefore, this study attempts to address the gap by developing an integrated framework to investigate the relationship amongst service environment, airport image, MAE, and passenger relational behaviours.

Considering the causal links amongst the aforementioned concepts in extant tourism and air transport literature (Park & Park, 2019; Wattanacharoensil et al., 2022), this research proposes that airport environment dimensions and perceived image are important predictors of MAE, and MAE is a mediator in the relationships between these two

constructs and passengers' future behaviours. This study employs relational behaviour constructs, including advocacy and openness to evaluate the power of construct validity. As argued by Melancon et al. (2011), relational behaviour is a vital concept that reflects the in-depth intention of consumers. If air passengers have satisfactory experiences with the airport environment (e.g. safety environment, departure gate, airport amenities), they are likely to gain favourable image and memorable experience, which subsequently contribute to positive relational behaviours towards an airport.

According to Wattanacharoensil et al. (2022), improving a better airport experience is amongst the primary objectives that airport managers must consider, particularly since an agreeable service environment could contribute to favourable airport image, MAE and passenger relational behaviours (Prentice & Kadan, 2019), and generate the potential for non-aeronautical revenues. Currently, there has been a scant discussion as to how the airport environment dimensions affect image, MAE, and subsequently advocacy and openness of tourists. This study intends to fill this gap by examining the structural relationship among these variables. The primary objectives of this study, therefore, are to empirically examine the air passengers' relational behaviours by considering airport environment, perceived image, and MAE in the context of the Thai international airport. This study develops a causal relationship model to investigate whether the perceived performance of airport environment influence airport image and MAE and whether the perceived image and MAE develop passenger relational behaviours. This research enhances knowledge of airport image and the MAE formation process and provides insights into MAE's antecedents and consequences and its critical roles in enhancing airport attractiveness and competitive positions in the marketplace.

LITERATURE REVIEW

Multi-attributes of Airport environment

Airport environment, in an operational term, refers to the primary functions and attributes of airports that affect air passengers' overall perceptions and experiences (Wattanacharoensil et al., 2022). Previous studies mostly incorporated service quality dimensions in addressing the key components of the airport environment. For example, Fakfare et al. (2021a) identified the quality of service at airports by considering dimensions, such as departure lounge, security checkpoint, circulation areas, and airport layout. Bezerra

and Gomes (2016) addressed the importance of the airport service environment by classifying quality factors into ambience, mobility, security, check-in, price, convenience, and basic facilities. Wattanacharoensil et al. (2022) argued that the environmental components of an international airport comprise ambient factor, security areas, aesthetic and social factors, facilities and functional areas. Bogicevic et al. (2016) further proposed design, aroma, functional organisation, temperature, seating, and cleanliness as imperative domains in an airport environment model. As airport environment is exposed to air passengers and can be assessed by them, each area thus must be well-managed to provide experience quality to air passengers (Wattanacharoensil et al., 2022).

Existing studies have attempted to identify and aggregate airport environment domains into broad service perspectives, but vary amongst studies (Trischler & Lohmann, 2018). No common agreement has been reached regarding a firm scale to evaluate an airport environment. Therefore, this study attempts to perform an analysis of the potential domains of the airport environment and formulate them on the basis of the notion discussed in the extant airport literature. These domains comprise interrelated dimensions, namely, airport amenities, layout, terminal ambience, check-in, security, gate area, and entertainment (Fakfare et al., 2021a; Park & Park, 2019; Trischler & Lohmann, 2018; Wattanacharoensil et al., 2022), which represent the holistic idea of airport operational performance.

Memorable Airport Experiences

Memorable travel experience refers to the experience that a tourist selectively formulates and can be recalled after a journey (Zhang et al., 2018). Arguably, all travel experiences may not be transformed into memorable experiences given that tourists may memorise only notable experiences of a trip. According to Hosany et al. (2022), the experiences that tourists remember are vitally important because tourists typically rely on their vivid memories when making decisions to travel. By this means, memorable experiences possibly will influence tourists' future behaviours.

In hospitality and tourism, qualitative and quantitative studies have been advanced to examine the structure and formation process of the memorable experience (Ali et al., 2016; Zhang et al., 2018). However, domains of the memorable travel experience are diverse among studies. For example, Tung and Ritchie (2011a, 2011b) utilised qualitative approach and found four underlying characteristics of memorable experience (i.e.

expectations, affect, consequentiality, and recollection**)** and five memorable experience dimensions (i.e. family milestones, identify formation, relationship development, freedom pursuits, and nostalgia re-enactment). Ali et al. (2016) identified travel experience domains, such as escape, peace of mind, involvement, and learning in quantitative research and explored the effect of travel experience on tourist memory, satisfaction, and behavioural intentions. The findings suggest that the five experience dimensions significantly affect tourist memory and subsequently become a memorable travel experience. Zhang et al. (2018) investigated the formation process and antecedents and consequences of memorable experience. The results revealed that memorable experience, which comprised of local culture, hedonism, refreshment, meaningfulness, involvement, knowledge, and novelty has a vital mediating role between tourists' image perceptions and revisit intentions.

In air transport studies, the understanding of functionality and airport environment affect passenger experience and thus the attractiveness of an airport is fundamental to airport research (Bogicevic et al., 2016). For instance, Bogicevic et al. (2016) explored the effects of the airport environment on air traveller's enjoyment and anxiety. The findings indicated that airport environmental attributes, such as design and aroma are important predictors of passengers' enjoyment, whilst inadequate functions and poor lighting facilities are the cause of travellers' anxiety. The impacts of airport environment on passenger satisfaction are further explored by Moon et al. (2016), considering the mediating role of two emotional elements (arousal and pleasure). The results suggested that airport environmental factors, such as layout, aesthetic features and cleanliness significantly affect pleasure, leading to passenger satisfaction**.** Given that the functionality and overall environment of the airports could influence passengers' experiences and overall satisfaction (Fakfare et al., 2021a), they could therefore contribute to MAE. Hu and Xu (2021) also indicated that memorable travel experience can be associated with various service attributes because the service attributes have a critical role in triggering a favourable tourist experience. Arguably, when the quality of airport environment is realised, air passengers possibly possess favourable experiences of the airport they visit, thereby leading to MAE. In line with the previous academic works, this research postulates that those air passengers who experience airport environment favourably tend to end up with MAE.

H1: *Airport environment positively influences MAE.*

Airport Image

In hospitality and tourism studies, scholars have investigated the concept of experience from various perspectives, from the core elements of experience, through quality experience to memorable experience (Zhang et al., 2018). In the quality and satisfactory experience studies, satisfaction is regarded as a key experiential factor. The level of satisfaction is generally assessed by traveller's perception of the performance attributes of tourism products or services. In the context of destination, Chen and Tsai (2007) examined the relationship amongst perceived image, value, satisfaction, and experience quality. The findings indicated that tourists' image perception of a destination positively influences value and experiential quality, and experiential quality in turn affects satisfaction. Wattanacharoensil et al. (2022) further explored the impacts of destination image on experiential satisfaction and found the significant relationship between them.

Similar to a destination (Lee et al., 2020), attribute performance of airport products and environment reflects its quality, contributing to passengers' experience and holistic impression of an airport or image (Nghiem-Phu & Suter, 2018). Similar to destination image, airport image consists of two elements (i.e. cognitive and affective images). Cognitive image involves physical and psychological attributes of the airport environment, whereas affective image concerns with feelings or emotions of air passengers when visiting the airport (Nghiem-Phu & Suter, 2018). Airport image has also become a vital component of airport branding. Instead of emphasising only an infrastructure that enables connectivity and passenger movement, many airports have increasingly attempted to improve their image by focusing more on emotional connections with customers (Wattanacharoensil et al., 2022). Park and Park (2019) found the effects that airport environment dimensions (i.e. cleanliness, convenience, amusement, attractiveness, pleasantness, and functionality) had on perceived servicescape (i.e. quality of airport experience) and perceived servicescape or experience, in turn, influenced airport satisfaction, image and passenger support intentions. Bogicevic et al. (2016) also discovered that airport environment is an element that affects image perception and satisfaction. Moreover, Wattanacharoensil et al. (2017) proposed the model of the airport experience in a way that airport environment is associated with perceived airport experience, image, and memory. Their study indicated that airport environment, representing the holistic idea of airport operational performance can form positive image and MAE. When attribute performance of airport product and environment is favourably perceived,

tourists tend to have a positive airport image, which in turn affects MAE (Wattanacharoensil et al., 2017). Given the association amongst airport service environment, airport image and MAE, the current study examines the impacts of airport environment on airport image and MAE in the context of airports. These hypotheses are thus postulated:

H2: *Airport environment positively influences airport image.*

H3: *Airport image positively influences MAE.*

Passenger Relational Behaviours

In the competitive environment, many airports have attempted to establish long-term relationships with their passengers. The purpose of building a good relationship with air passengers is to gain favourable support, which helps sustain benefits for the airport in the long run (Bogicevic et al., 2016). In hospitality and tourism, repurchase or revisit is considered a critical part of the recency-frequency-monetary model (Fakfare et al., 2020b). For example, a frequent flyer program is generally offered by an airline to create loyalty amongst its customers; a frequent guest program is developed by a hotel to create customer loyalty (Oppermann, 2000). However, repurchase or revisit alone does not reflect tourists' loyalty behaviour. Tourists may not repurchase a tourism product, although they are happy with it because they have not yet explored other products from different service providers. Instead, they showed alternative supportive actions, such as recommendations to friends (Chen & Gursoy, 2001) and suggestions for improvements (Melancon et al., 2011).

Melancon et al. (2011, p. 345) proposed a relational value (i.e., relational behaviour) concept and conceptualised it as the nonfinancial, social behaviours toward the organisation that result from relational exchanges with consumers. When customers play supporting roles, service organisations gain long-term benefits from the relational behaviours (Lee et al., 2015). Melancon et al. (2011) established five underlying domains of relational behaviours, namely, advocacy, openness, acquiescence, immunity, and honesty. Advocacy refers to customers' willingness to defend an organisation, although negative publicity exists. Openness reflects the intention of consumers to provide useful comments and suggestions for improvement with a service firm. Acquiescence describes the degree to which consumers are willing to establish a good relationship with a service provider (e.g. accepting changes or complying with a new policy) (Bendapudi & Berry, 1997). Honesty refers to the degree of being honest towards an organisation in any form. Immunity indicates resistance

to consuming competitors' products or services, although the competitors offer an appealing package (Bolton et al., 2000). The abovementioned domains have been conceptualised as underlying relational behaviours of consumers towards a service firm (Melancon et al., 2011).

In the context of an airport, if air passengers demonstrate unsupportive relational behaviours, then the airport will experience a significant loss of financial benefits from defecting passenger groups (Park & Park, 2019). Developing a relational strength contributes to significant economic and relational values (Fakfare et al., 2020b), particularly in terms of advocacy and openness; therefore, many airports attempt to maintain long-term relationships with air passengers by developing their experiential quality through high-quality airport attributes and environment (Fakfare et al., 2021a; Park & Park, 2019).

Previous research has examined the association of an airport environment to experience (i.e. satisfaction), airport image and behavioural intentions (Park & Park, 2019), and thus this study also verifies the influence of airport environment on MAE, airport image and passenger relational behaviours, including advocacy and openness. Nghiem-Phu and Suter (2018) found that airports have a critical part in forming tourists' impressions or images of a place. Wattanacharoensil et al. (2017) claimed that perceived airport environment contributes to passengers' experience of an airport and subsequently becomes MAE, and MAE is likely to influence future behaviours of air passengers. Park and Park (2019) also found the relationship amongst airport environment, experiential satisfaction, airport image and supportive behaviours and verified that airport environment is a critical part in forming airport experience, image and passengers' future behavioural response. In a destination context, tourists' relational behaviours, in terms of advocacy, openness and immunity were found to be influenced by quality dimensions and the imaginative representation of travel activity (Fakfare et al., 2020b). Based on the aforementioned airport studies, it implies that passenger relational behaviours with an airport rely on perceived airport image and MAE. The more favourable image perception and MAE that passengers have based on their experiences of the airport environment, the more favourable relational behaviours (e.g. advocacy and openness) they may demonstrate. Therefore, this study explores the effects of the holistic airport image and MAE on passenger relational behaviours. The two relational behaviour domains (i.e. advocacy and openness) are interwoven to embody the rich details of air passengers' supportive behaviours. The acquiescence immunity and honesty domains are not employed because the nature of their

measurements does not fit into the airport context. The characteristics identified in the dimensions of acquiescence, immunity, and honesty, such as resistance to switch to competitors and exhibiting opportunistic behaviours, are considered irrelevant. As such, the following hypotheses are proposed in the airport context. Figure 1 displays the proposed conceptual model.

H4a: *Airport image positively influences advocacy.*

H4b: *Airport image positively influences openness.*

H5a: *MAE positively influences advocacy.*

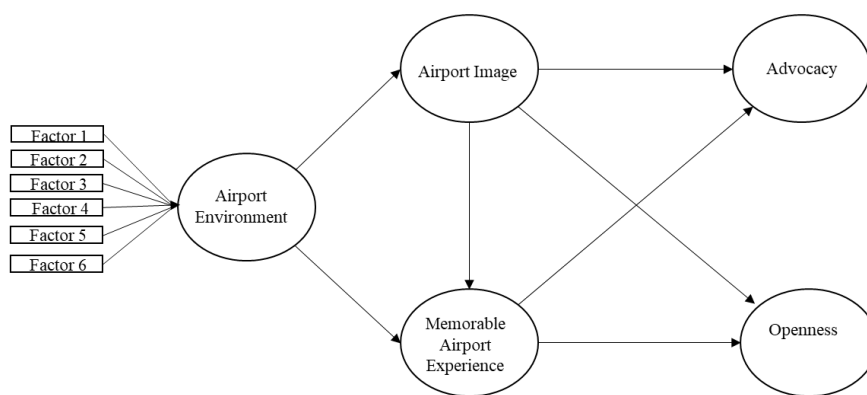**H5b:** *MAE positively influences openness.*

Figure 1**.** *Proposed research model*

METHODOLOGY

Study 1: Measurement development and scale validation

This research requires the measurement of four constructs, namely, airport environment, airport image, MAE, and relational behaviours. The partial aspects of airport environment were presented in the extant airport literature, and therefore qualitative study should be first performed to identify airport environment domains and attributes that are important to air passengers. This study followed a scale development procedure as recommended by Churchill (1979), applying qualitative techniques, including **(1)** an in-depth analysis of airport literature, **(2)** an expert panel review to purify the salient attributes relevant to the airport environment, and **(3)** scale refinement and validation. The initial analysis of the literature revealed 37 items from the seven airport environment domains, namely, airport information and layout, check-in, terminal ambience, security, airport amenities, gate area, and entertainment (Bogicevic et al., 2016; Fakfare et al., 2021a; Jeon & Kim, 2012; Park & Park, 2019; Trischler &

Lohmann, 2018). These domains are intertwined to represent the holistic idea of airport environment.

Considering the outlined environment dimensions from the abovementioned air transport literature, this study first operationalised airport environment as a second-order formative construct of seven domains (i.e. airport information and layout, check-in, terminal ambience, security, airport amenities, gate area, and entertainment). The researcher measured the airport image using five items modified from Park and Park (2019). and Wattanacharoensil et al. (2017). This study assessed MAE using a scale adopted from Stokburger-Sauer et al. (2012). This study measured relational behaviour using two dimensions (advocacy and openness) with seven items. This study adopted the scales of the items from Melancon et al. (2011). The researcher operationalised all items using a seven-point Likert scale.

Study location and data gathering

The data gathering process required experienced airport users to respond to an online survey. The researcher filtered potential respondents through a dichotomous question. Due to the negative impact of COVID-19 crisis, only Thai experienced airport users who visited an international airport within Thailand in the past year were targeted for the survey. In Thailand, there are 11 international airports, including Hat Yai International Airport, Suvarnabhumi Airport, Don Mueang International Airport, Phuket International Airport, Chiang Mai International Airport, Mae Fah Luang-Chiang Rai International Airport, Samui International Airport, Krabi International Airport, Surat Thani International Airport, Udon Thani International Airport and U-Tapao International Airport (Fakfare et al., 2021a). To trigger memory cues of the respondents about their past airport experiences, the researcher has inquired the respondents to indicate one international airport from the aforementioned list that they have recently used for air transfer within 12 months.

A self-completion survey was conducted from January 2020-February 2020. Considering that COVID-19 pandemic is a concern since the beginning of 2020, an onsite survey was thus not advisable. Therefore, the researcher sent the online questionnaires via a link using convenience and snowball sampling to friends and relatives of the researcher. As a result, this study obtained 879 completed data from the respondents.

The majority of the respondents were female (61%). The age group between 18 and 30 years old accounted for over 75% of the respondents.

This statistical data is consistent with the data provided by Kunst (2019) considering that the age group between 18 and 29 years old is the majority of online travel users. 48.1% of the respondents visited an international airport as a passenger 1-2 times annually, followed by 3-6 (34%) and 7 times and above (17.8%). A majority of respondents (47.4%) had recollected their memories of experiences at Survanabhumi Airport, followed by Don Mueang International Airport (42%), Phuket International Airport (4.3%), Chiang Mai International Airport (3.2%), and others (e.g., Samui, Krabi) (3.1%).

Nonresponse bias was verified by comparing the responses of the first 10% of the questionnaires completed with those of the survey data in the last 10% to check for statistical differences in the mean values for each item. The results show a nonsignificant difference within the examined data (p = 0.05), suggesting that nonresponse bias is not the main concern. To verify the data normality, this study examined the skewness and kurtosis of each item (Appendix 1). The skewness ad kurtosis values were found to range between -0.93 and 0.54, thus indicating that data is normally distributed (George & Mallery, 2010).

This research further performed a series of analyses of variance (ANOVA) to detect the differences among the various demographic segments. According to Appendix 2, the F-test results of airport environmental components revealed nonsignificant gender differences among components. For the age group, we found that air travellers who are 60 years old and above showed more favourable perceptions of security and gate areas. For travel experience, groups based on less frequent travel per year (1-6 times) tend to have more favourable perceptions of entertainment and gate area. Other than these clusters, F-tests, in general, did not show statistical differences amongst airport environment components.

FINDINGS

Principal component analysis for airport environment

To refine the scale, the survey data (n = 879) was split into two subsets: Sample 1 and Sample 2. This practice is an important process in the previous scale development research (Fakfare et al., 2020a). Sample 1 (n = 500) was analysed to identify underlying components by conducting principal component analysis (PCA) with varimax rotation. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (0.972) and Bartlett's test of sphericity (p < 0.001) were verified. Airport environment items with

component loadings and communalities below 0.4 were deleted (Hair et al., 2010). Consequently, the airport environment attributes were found to consist of seven components with 37 items. The seven components are airport information and layout, check-in, terminal ambience, security, airport amenities, gate area, and entertainment (Appendix 3). These components account for 72.02% of the total variance. All components have acceptable reliability (i.e., > 0.7) (Nunnally, 1978).

Measurement model

This study employed PLS-SEM to assess the measurement and the structural frameworks. PLS-SEM provides several benefits, such as an ability to; manage the non-normal distribution of data; and manipulate formative and reflective constructs simultaneously (Henseler et al., 2009). According to do Valle and Assaker (2016), the association for reflective model develops from the factor to the indicators, indicating that all items are relevant, whilst association for formative constructs flows from the items to the factor, indicating that each item is unrelated. A formative construct assumes that the items used for measurement are dissimilar and not interchangeable with one another. The formative measures are likely to affect the latent variable rather than being influenced by it. Therefore, the presence of an indicator affects the meaning and content validity of the model. By contrast, the reflective model assumes that the indicators used for measurement share a similar meaning. Previous tourism studies (e.g., Meeprom & Fakfare, 2021; Fakfare et al., 2021b) also incorporated both reflective and formative constructs in a research model. As PLS-SEM can handle formative and reflective constructs simultaneously (Hair et al., 2017), this research implements two reflective models (advocacy and openness), one second-order formative model (airport environment) and two formative constructs (airport image and MAE) to verify a structural model.

The validity measurement model was assessed through several procedures. First, the researcher evaluated the measurement of the formative constructs (i.e. airport environment, airport image and MAE) by collinearity and construct validity (Halpenny et al., 2018). The second-order formative construct of airport environment was established on the basis of the procedures recommended by van Riel et al. (2017) considering that the airport environment represents the holistic notion of airport operational performance (Bezerra & Gomes, 2016; Meeprom & Fakfare, 2021; Park & Park, 2019; Trischler & Lohmann, 2018). This study performed a statistical analysis to assess whether formative modelling is an appropriate measure

for this construct. According to Hair et al. (2016), when the weights for the formative constructs are positive and significant, they should be retained. This study found the significance of the first-order factors to second-order formative construct to be positive and significant (p < 0.05), thereby verifying six important facets (i.e. airport information and layout, terminal ambience, security, airport amenities, gate area, and entertainment). Due to the insignificant path coefficient, check-in was not verified as an important airport environment dimension. This result may be associated with the increased usage of information communication technologies (ICTs) to improve air traveller movements during COVID-19 (Wattanacharoensil et al., 2022). For instance, technology that tracks passenger authentication has increasingly been used at several major international airports to facilitate passengers processing through check-in and immigration. This development may have affected the relevance and importance of the traditional check-in dimension on passengers' perceptions of the airport environment attributes during COVID-19.

The collinearity was also evaluated by the variance inflation factor (VIF). All VIFs in this research fluctuated between 2.66-4.33 (lower than the threshold of 5), thereby indicating the lack of collinearity issues (Table 1). Similar to airport environment, this study assessed the measurement quality of airport image and MAE by VIF and the significance of path coefficients. As exhibited in Table 1, all VIFs of airport image and MAE were found below 5, and all hypothesized paths were significant (p < 0.05), thereby verifying the validity of the formative models.

The researcher assessed the two reflective models based on their construct reliability (CR) and model validities. Table 1 shows that advocacy and openness exhibited acceptable convergent validity by the AVE greater than minimum threshold of 0.5 (Fakfare & Lee, 2019). All CR values were found to be above 0.70 (Bagozzi & Yi, 1988), thus indicating the constructs are reliable (Table 1). This study also evaluated the heterotrait-monotrait ratio of correlations (HTMT) to prove the discriminant validity. As the HTMT value was discovered as 0.79 (lower than the preliminary recommended value of 0.9), the discriminant validity of the model was verified (Benitez et al., 2020). The SRMR was also found as 0.04 (lower than 0.08), thus suggesting an acceptable model fit (Henseler et al., 2014).

Study 2: Structural model and hypothesis testing

In line with the two-step approach in PLS-SEM, this study first obtained the factor scores for the first-order constructs (i.e. airport environment) (van

Riel et al., 2017). Next, the first-order constructs were reduced to single indicators, and their factor scores served as items of the second-order factor. Thereafter, this study examined the structural model, including airport environment, airport image, MAE, and passenger relational behaviours to verify the causal relationships amongst the variables. The structural model was evaluated on the basis of two primary results, namely, the path coefficients and r-square values. Figure 2 shows that all structural paths were significant.

Table 1. *Measurement model with validity and reliability of formative and reflective constructs*

Factor	Weight	Loading	AVE	CR	VIF
Airport Environment[1] (AE)		N/A	N/A	N/A	
Airport Information and Layout (AI)	**0.10**				2.66
Terminal Ambience (TA)	**0.15**				3.22
Security (SC)	**0.13**				3.16
Airport Amenities (AA)	**0.13**				4.21
Gate Area (GA)	**0.11**				4.33
Entertainment (EN)	**0.50**				3.23
Airport Image[1] (IMG)		N/A	N/A	N/A	
1. I have a favourable image of the airport.	**0.19**				3.58
2. The atmosphere of the airport is excellent.	**0.28**				3.88
3. The airport provides its passengers with a sense of friendliness.	**0.19**				3.77
					4.41
4. The airport provides its passengers with a sense of confidence.	**0.23**				4.15
5. The overall image of the airport is satisfactory.	**0.21**				
Memorable Airport Experience[1] (MAE)		N/A	N/A	N/A	
1. I have many memorable experiences with this airport.	**0.09**				3.02
2. Thinking of visiting this airport brings back good memories.	**0.39**				3.42
3. I really enjoyed the experience encountered in this airport.	**0.24**				3.62
4. I experienced something new (e.g. environment, airport management, and so on) during this airport visitation.	**0.37**				2.98
Advocacy[2] (ADV)			0.82	0.93	N/A
1. I would try to get my friends and family to visit this airport.		**0.91**			
2. I would seldom miss an opportunity to tell others good things about this airport.		**0.91**			
3. I would defend this airport to others if I heard someone speaking poorly about it.		**0.89**			
4. I would bring friends/family with me to this airport because I think they would like it here.		**0.92**			
Openness[2] (OPN)			0.77	0.85	N/A
1. I would feel comfortable telling the airport staff when I think something needs improvement.		**0.88**			
2. I would suggest changes to this airport if there was any problem with their services.		**0.90**			
3. I would be willing to provide useful information to help this airport out.		**0.86**			

Note: 1 = Formative; 2 = Reflective; **Bold** values were significant at p < 0.05

The resulting structural model (Table 2) reported the coefficient values between airport environment and MAE, and airport image to be 0.41 (t = 9.83) and 0.85 (t = 70.95), respectively. The higher air passengers assess the overall operational performance of airport in terms of airport

information and layout, terminal ambience, security, airport amenities, gate area and entertainment, the more probability they form high level MAE and perceived favourable airport image. Therefore, H1 and H2 are supported. Similarly, airport image directly affects MAE and relational behaviours (advocacy and openness) with path coefficient values 0.43 (t = 9.26), 0.47 (t = 11.95), and 0.36 (t = 6.75), respectively. The findings indicated that the greater air passengers perceived favourable image of an airport, the more probability they remain MAE, and exhibit relational behaviours in terms of advocacy and openness. Therefore, H3 and H4 are supported. In addition, MAE theoretically predicted passenger relational behaviours in terms of advocacy (b = 0.45, t = 11.13) and openness (b = 0.36, t = 7.25), thereby supporting H5.
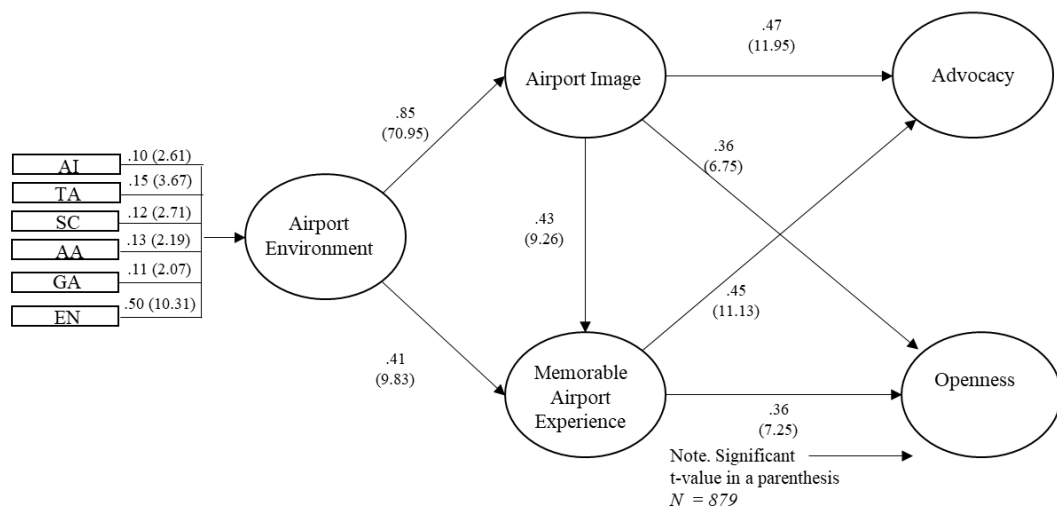

Figure 2. *Structural model*

Table 2. *Hypothesis results*

	Hypotheses	Path coefficients	t-value	Result
H1	AE => MAE	0.41	9.83	Supported
H2	AE => IMG	0.85	70.95	Supported
H3	IMG => MAE	0.43	9.26	Supported
H4a	IMG => AVC	0.47	11.95	Supported
H4b	IMG => OPN	0.36	6.75	Supported
H5a	MAE => AVC	0.45	1.113	Supported
H5b	MAE => OPN	0.36	7.25	Supported

R^2 represents the proportion of the variance for every construct that is explained by an independent variable. In this study, the airport image construct explained 73% of the variance in airport environment. R^2 value of MAE was 0.66, suggesting that the influence of the two predictor variables (i.e. airport environment and airport image) explains 66% of MAE. Airport

image and MAE altogether explained 76% in advocacy and 47% in openness. All R^2 scores were found to be superior to the minimum edge of 25% (Hair et al., 2016).

DISCUSSION AND CONCLUSION

This paper develops several points of discussion in the airport context. First, the airport environment, which was developed as a formative second-order model of six factors (i.e. airport information and layout, terminal ambience, security, airport amenities, gate area, and entertainment) was verified as significant antecedents of airport image and MAE. In line with previous studies (Bogicevic et al., 2016; Park & Park, 2019; Wattanacharoensil et al., 2017), air passengers' holistic impressions, beliefs and experiences about an airport are formed according to their judgements of quality attributes of airport environment. The attractiveness/quality of an airport is also determined by travellers' perceptions about the performance of that airport to match their anticipations.

Second, this study found that MAE and airport image reflect a strong connection between the quality of airport environment and passenger desires, given that they represent the benefits that travellers receive from an airport. The findings support the work by Park and Ryu (2019) and Wattanacharoensil et al. (2017) who discovered that airport's physical servicescape, such as terminal ambience, layout and seating comfort affect experiential satisfaction, image perception, and memorable experience of travellers. The higher air passengers assess the overall airport environment, the stronger they are confident with the airport to meet their expectations, then the greater tendency of air passengers to realise a favourable airport image and received MAE. The outcome that airport environment and perceived image altogether show 66% variance of MAE also verifies that these concepts are vital antecedents of MAE.

Third, when examining the impact of the airport image on MAE and passenger relational behaviours, airport image comprising such formative indicators as a sense of friendliness, atmosphere and confidence, exerts a significant and considerable effect on MAE and relational behaviours (advocacy and openness). The results of this research support the previous study by Zhang et al. (2018) that image perception could form memorable experiences and future behaviours of tourists. The stronger the airport promotes its image (through various environmental components added to the holistic impressions of passengers), the more probability of passengers

to receive MAE and exhibit relational value with airports regarding advocacy and openness.

Finally, in tourism and airport studies, behaviour intention is often employed as a consequence of primary service-oriented constructs (i.e. satisfaction, quality and value) (Baker & Crompton, 2000; Jeon & Kim, 2012), although other outcome variables that fit particular tourism fields may be available. Melancon et al. (2011) proposed that relational behaviour is an important domain that represents the richer intention of consumers compared with traditional concepts, such as behaviour intentions. This research employed the concept of relational behaviours, particularly in terms of advocacy and openness to scrutinise issues in the airport field and verified the validity and accuracy of the prediction of the proposed research model. This study found MAE to influence relational value for advocacy and openness considerably, and this result supports prior findings that memorable experience is likely to influence tourists' future behavioural intentions (Tsai, 2016). The findings suggest that air passengers who receive MAE are likely to express their relational behaviours with an airport in terms of advocacy and openness. Thus, MAE has been deemed a critical driver of passenger relational behaviours.

Theoretical implications

This research sought to examine whether the realised quality of overall airport environment contributes to the formation of airport image and MAE, and the perceived image and MAE subsequently develop passenger relational behaviours. Previous air transport literature addressed the causal relationships amongst service environment, image and behavioural response in understanding tourist behaviours (Bogicevic et al., 2016; Park & Park, 2019). When visiting an airport, travellers expect to experience high-quality services and stay in an agreeable environment (Fakfare et al., 2021a), therefore understanding what environmental components of an airport added to the holistic perceptions of passengers, and how they affect airport image, MAE and passenger relational value with an airport are essential. However, no study has empirically examined passenger behaviours using the structural relationships of airport environment, airport image, MAE and relational behaviours. Through the empirical investigation of these essential airport concepts, this study delivers a stretched view of airport studies, addressing the research gap to advance the air transport literature.

In addition, this research supported the adoption of PLS-SEM in the airport literature. Three of the study's five main variables (i.e. airport

environment, airport image, and MAE) were presented as formative constructs, not previously investigated in this means. For instance, airport environment includes a variety of attributes that had been previously identified as distinct domains (e.g. airport information and layout, terminal ambience, security, airport amenities, gate area, and entertainment). Integrating these varied domains into a single construct, on the basis of their conceptualisation, develops efforts to include distinct, but relevant phenomena in the same construct, thus leading to greater understanding and representation of the construct in a study model (Halpenny et al., 2018). The reflective-formative specifications in PLS were also verified on the basis of the suggestion of van Riel et al. (2017).

Managerial implications

The findings of this study offer some implications for airport operations and management. First, although many airports have increasingly exercised service-oriented marketing and business philosophy (Wattanacharoensil et al., 2017), they often fail to provide passenger experiences from the travellers' perspective. Passengers' desires and experiences have been neglected, as airports mostly promote their facilities and physical products supplied within the terminals, thereby making it difficult to maintain competitive positions in the market. The study about airport experience and MAE can guide concerned authorities about the vital role of MAE.

Second, a causal connection exists amongst the overall airport environment, airport image, MAE, and passenger relational behaviours. Particularly, the relationship between airport environment and perceived image and MAE is strong. Airport management and authority should not devote efforts only to creating passenger satisfaction but rather pay attention to building airport image and forming MAE. The quality of the overall airport environment, particularly in terms of airport information and layout, terminal ambience, security, airport amenities, gate area, and entertainment should be irresistibly projected because air passengers who realised the quality of the airport environment are likely to experience a boost to favourable airport image and MAE.

Although air passengers may not often visit an airport they like, airport managers must maintain favourable image and MAE every time a passenger visits, because fulfilled passengers have more probability to exhibit supportive behaviours with airports in terms of advocacy and openness. For example, at an airport, besides showcasing an array of high-quality service functions and modern facilities, airport managers can

manage to provide leisure activities and exhibitions, such as themed gardens, art galleries, and other unusual pastimes for passengers. The specially arranged activities not only induce a positive image of an airport and passengers' memorable experience but also helps develop passenger relational behaviours and increase the attractiveness of an airport.

In addition, the recent COVID-19 impact also makes the overall airport environment to be important more than ever, given that passengers would highly expect an airport to restore and maintain confidence, particularly in terms of safety and hygiene. Therefore, common areas and facilities should be sanitised on a regular schedule. Airport managers are suggested to initiate and implement protective precautionary measures to ensure that all areas in the terminals are disinfected. This management effort is helpful to develop a good airport image in air passengers' eyes as well as enhance their MAE.

Limitations and Future Research

This research has some limitations. First, given that all respondents recollect airport experiences from their recent visits at airports located within one country (i.e. Thailand), the established theoretical framework may exhibit distinctive characteristics in explaining passenger behaviours in a specific context. Second, this study analysed the effect of airport environment on image, MAE, and relational behaviours on the basis of the second-order formative model of six dimensions (i.e. airport information and layout, terminal ambience, security, airport amenities, gate area, and entertainment). Certain additional domains of the airport environment, such as immigration, airport lounge, and baggage facilities (Han et al., 2012; Trischler & Lohmann, 2018) are not captured in this study. Integrating those potential domains in a second-order formative construct would be interesting to verify its validity. Third, the respondents were mainly young travellers, and the airports they selected fall into one national setting. Therefore, the ability of a hypothesis or theory to explain the subject matter may be biased toward this geographical context. In addition, this research did not consider the moderating roles of potential variables, such as demographics (age, gender, income), airport satisfaction level (high and low) and airport type (domestic and international). Future studies are encouraged to adopt these moderating variables together with the theoretical model developed in this study.

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APPENDICES

Appendix 1. *Data normality test*

Airport environment attributes	Mean	SD	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Airport Information and Layout (AI)						
AI1: The airport's signage and wayfinding clearly direct passengers to airport's services/facilities.	5.37	1.24	-0.49	0.08	-0.04	0.17
AI2: Size of signage is appropriate.	5.32	1.21	-0.42	0.08	-0.23	0.17
AI3: Quantity of signage is sufficient.	5.20	1.29	-0.52	0.08	0.08	0.17
AI4: The airport's layout is properly designed to cater for passenger's special needs (e.g. elderly passengers or family with kids).	4.90 / 4.89	1.40 / 1.41	-0.41 / -0.50	0.08	-0.14 / 0.08	0.17
AI5: The airport's physical layout avoids crowding and enabled easy movement of passengers.	4.96	1.41	-0.43	0.08	-0.17	0.17
Terminal Ambience (TA)						
TA1: The lighting at this airport gives a pleasant feeling.	5.10	1.37	-0.39	0.08	-0.24	0.17
TA2: The temperature at this airport is comfortable.	5.08	1.34	-0.48	0.08	-0.08	0.17
TA3: The announcement levels at this airport are appropriate.	4.91	1.39	-0.38	0.08	-0.18	0.17
TA4: The aroma at this airport is fitting and desirable.	5.15	1.40	-0.59	0.08	0.03	0.17
TA5: The airport maintains clean facilities.	5.37	1.28	-0.56	0.08	-0.02	0.17
Check-in (CI)						
CI1: Check-in Staff are friendly, courteous and helpful.	5.49	1.22	-0.58	0.08	-0.06	0.17
CI2: Check-in Staff communicate clear and appropriate message.	5.27	1.27	-0.50	0.08	0.07	0.17
CI3: The Check-in process is efficient.	5.44	1.27	-0.71	0.08	0.35	0.17
CI4: Luggage carts are available for passengers.	5.07	1.33	-0.54	0.08	0.13	0.17
CI5: Wait-time at check-in is appropriate.	5.14	1.36	-0.58	0.08	0.13	0.17
CI6: The self-check-in kiosks are appropriately designed and easy to use.	5.08	1.39	-0.51	0.08	-0.06	0.17
Security (SC)						
SC1: I felt safe and secure during the security screening processes.	5.24	1.30	-0.53	0.08	0.10	0.17
SC2: Security staff were friendly, courteous and helpful.	5.20	1.28	-0.36	0.08	-0.18	0.17
SC3: Security Staff communicate clear and appropriate message.	5.25	1.29	-0.58	0.08	0.17	0.17
SC4: Security screening on passengers and personal belongings was thorough.	5.15	1.28	-0.48	0.08	0.12	0.17
SC5: Wait-time at security checkpoints is appropriate.	5.18	1.45	-0.68	0.08	0.08	0.17
Airport Amenities (AA)						
AA1: Washroom/toilets are clean.	5.05	1.45	-0.63	0.08	0.05	0.17
AA2: Washroom/toilets are widely available for passengers.	4.73	1.59	-0.44	0.08	-0.37	0.17
AA3: WIFI and PC are available for passengers.	5.01	1.41	-0.48	0.08	-0.05	0.17
AA4: Restaurants offer a wide range of products.	4.23	1.84	-0.23	0.08	-0.93	0.17
AA5: Restaurants offer products with reasonable price.	5.17	1.32	-0.47	0.08	-0.08	0.17
AA6: Banks/ATM/Exchange are available to cater for passenger's needs.	5.10	1.33	-0.51	0.08	0.14	0.17
AA7: Retail stores are available to cater for passenger's needs.	4.97	1.36	-0.51	0.08	0.18	0.17
Gate Area (GA)						
GA1: Departure hall is not crowding.	5.19	1.30	-0.56	0.08	0.10	0.17
GA2: The airport provided aero-bridges with good condition that eased access from the terminal to the aircraft.	5.12 / 5.02	1.32 / 1.44	-0.53 / -0.57	0.08	0.11 / 0.01	0.17
GA3: The airport provided comfortable and spacious seating in the waiting gate.	4.83	1.53	-0.55	0.08	-0.07	0.17
GA4: The airport provided enough seating in the gate area.	5.13	1.29	-0.47	0.08	0.02	0.17
GA5: The airport provided enough bed-seating for transfer passengers.	5.15	1.32	-0.54	0.08	0.08	0.17
Entertainment (EN)						
EN1: The interior decoration of the airport is attractive.	5.26	1.25	-0.57	0.08	0.34	0.17
EN2: The interior and exterior of the airport are up-to-date.	5.01	1.43	-0.52	0.08	-0.05	0.17
EN3: Use of airport amenities is enjoyable.	5.05	1.42	-0.64	0.08	0.27	0.17

EN4: Events and exhibitions provided by the airport are interesting.	4.65	1.56	-0.35	0.08	-0.33	0.17
Airport Image (IMG)						
IMG1	4.65	1.59	-0.42	0.08	-0.29	0.17
IMG2	5.22	1.37	-0.63	0.08	0.19	0.17
IMG3	5.09	1.35	-0.52	0.08	0.07	0.17
IMG4	5.11	1.33	-0.54	0.08	0.23	0.17
IMG5	5.13	1.34	-0.50	0.08	0.06	0.17
Memorable Airport Experience (MAE)						
MAE1	5.25	1.30	-0.56	0.08	0.12	0.17
MAE2	5.11	1.38	-0.51	0.08	-0.01	0.17
MAE3	4.97	1.42	-0.54	0.08	0.00	0.17
MAE4	4.96	1.37	-0.50	0.08	0.11	0.17
MAE5	4.95	1.39	-0.53	0.08	0.15	0.17
Advocacy (ADV)						
ADV1	5.14	1.33	-0.56	0.08	0.24	0.17
ADV2	4.98	1.36	-0.47	0.08	0.04	0.17
ADV3	4.82	1.42	-0.49	0.08	0.14	0.17
ADV4	4.97	1.34	-0.51	0.08	0.28	0.17
Openness (OPN)						
OPN1	5.01	1.33	-0.47	0.08	0.17	0.17
OPN2	5.23	1.25	-0.52	0.08	0.35	0.17
OPN3	5.42	1.24	-0.65	0.08	0.54	0.17

Appendix 2. *Analysis of variance of demographic segments*

Gender	AI	TA	CI	SC	AA	GA	EN
Male (Mean)	5.05	4.88	5.29	5.11	4.79	4.91	4.69
Female (Mean)	5.10	4.98	5.27	5.08	4.80	4.89	4.62
F-ratio	.24	.74	.02	.43	.01	.01	.36
P-value	.62	.39	.90	.84	.93	.92	.55
Age (years)	AI	TA	CI	SC	AA	GA	EN
20 or below	5.10	5.19	5.39	5.28	4.97	4.99	4.94
21-30	5.16	4.99	5.34	5.21	4.97	5.08	4.84
31-40	4.66	4.33	4.97	4.62	4.11	4.33	3.77
41-50	4.92	4.72	5.17	4.71	4.34	4.33	4.09
51-60	5.11	5.11	5.21	4.92	4.57	4.68	4.75
61 and above	5.43	5.38	5.45	5.39	4.93	5.25	4.69
F-ratio	2.42	4.67	1.53	4.03	6.99	6.15	7.73
P-value	.35	**.00**	.17	**.001**	**.001**	**.001**	**.001**
Travel experience (times)	AI	TA	CI	SC	AA	GA	EN
1-2	5.07	4.94	5.30	5.15	4.92	5.04	4.86
3-4	5.12	4.97	5.42	5.16	4.79	4.92	4.53
5-6	5.20	5.11	5.21	5.22	4.91	4.93	4.82
7-8	5.13	4.91	5.44	5.22	4.97	4.94	4.51
9-10	5.35	4.90	5.29	4.81	4.55	4.72	4.56
11 and above	4.74	4.65	4.91	4.64	4.12	4.28	3.97
F-ratio	1.47	.94	1.96	2.22	4.24	3.22	3.93
P-value	.20	.46	.08	.051	**.01**	**.007**	**.002**

Appendix 3. *PCA Results*

Airport environment attributes	Factor loading	Cronbach's alpha
Airport Information and Layout (AI)		0.88
AI1	0.76	
AI2	0.74	
AI3	0.74	
AI4	0.54	
AI5	0.46	
Terminal Ambience (TA)		0.87
TA1	0.53	
TA2	0.60	
TA3	0.47	
TA4	0.71	
TA5	0.64	
Check-in (CI)		0.88
CI1	0.78	
CI2	0.71	
CI3	0.68	
CI4	0.60	
CI5	0.53	
CI6	0.51	
Security (SC)		0.92
SC1	0.51	
SC2	0.62	
SC3	0.67	
SC4	0.60	
SC5	0.50	
Airport Amenities (AA)		0.89
AA1	0.61	
AA2	0.58	
AA3	0.62	
AA4	0.57	
AA5	0.70	
AA6	0.76	
AA7	0.63	
Gate Area (GA)		0.90
GA1	0.46	
GA2	0.43	
GA3	0.55	
GA4	0.55	
GA5	0.55	
Entertainment (EN)		0.91
EN1	0.76	
EN2	0.72	
EN3:	0.68	
EN4	0.65	