

This is the accepted version of the article published in Journal of Hospitality & Tourism Research

A reflective – formative hierarchical component model of perceived authenticity

Abstract

Discussions on authenticity have become prominent in tourism research, particularly in the context of heritage tourism. Quantitative approaches have become popular methods to investigate authenticity, especially from a tourist's perspective. Previous studies, however, have failed to include multiple forms of authenticity into a single quantitative scale, as well as to use a formative approach for its measures. This study develops a comprehensive and reliable scale of authenticity, considering its multi-dimensional complexity and its formative nature. A reflective – formative hierarchical component model of perceived authenticity towards heritage experience, including three lower-order components of objective authenticity, existential authenticity, and constructive authenticity, is proposed. The scale of authenticity also indicates a strong predictive power over tourist satisfaction.

Keywords: authenticity; scale development; hierarchical component model; PLS-SEM; heritage experience

1. Introduction

The discussion of tourists' search for authenticity has started in the 1960s, but only recent studies highlight that, while some tourists look for authenticity, others are not particularly concerned. This development has changed the investigation of tourists' perceptions of authenticity and of what forms of authenticity are being investigated. Related studies indicate that tourists have various related preferences and look for a diverse range of experiences (Chhabra, 2010; Silver, 1993; Waite, 2000). While various forms of authenticity - with the three major being objective, constructive and existential - have been defined (Wang, 1999), they have usually not been investigated concurrently; with exceptions including Bryce, Curran, O'Gorman, and Taheri (2015), Chhabra (2007, 2010), Kolar and Zabkar (2010), Robinson and Clifford (2012); Zatori, Smith, and Puczko (2018).

A review of past studies reveals that, with the emerging attention on analyzing authenticity from a tourist's perspective, quantitative research has become popular. About half of the studies on authenticity in tourism solely or primarily applied this approach in the last five years. Various scales have been used to measure authenticity from a tourist point of view, from a single item or construct scale (such as Budruk *et al.*, 2008; Chung, Kim, Lee, & Kim, 2018) to a multi-dimensional scale (such as Kolar & Zabkar, 2010; Revilla & Dodd, 2003; Ye, Xiao, & Zhou, 2018). Nonetheless, its three main forms, namely objective, constructive and existential, have never been included in a single scale or a single construct of *overall authenticity*. Moreover, when several forms of authenticity were included, they were either measured and examined separately or used as reflective a measure; meaning that they are considered as interchangeable. This contradicts that these forms are conceptually distinct and that each of them individually could not be ignored in a tourism setting (Wang, 1999; Ye *et al.*, 2018).

This study, therefore, aims at developing a comprehensive and reliable scale of authenticity, considering its multi-dimensional complexity and its formative nature. With the lack of a higher-order as well as formative measure of authentic experience, this study contributes to the current literature through a valid and reliable reflective – formative hierarchical component model of perceived authenticity. The scale development is conducted in a heritage tourism context, with Hong Kong being the case study. Hong Kong is an urban destination where there is a growing interest in heritage tourism from both, government and tourists. The city has gone through a rapid transformation and strong commodification since the 1980s. As a result, heritage sites in the city and its surroundings have been reconstructed at various levels. The authenticity of heritage experience is therefore an essential issue for Hong Kong and its various types of attractions offering diverse levels of authenticity.

2. Literature Review

2.1. A review of studies on authenticity in tourism

The concept of authenticity has been a topic of discussion in sociology and cultural studies for a long time (Erickson, 1995) and possibly originates from a museum context (Trilling, 1972 as cited in Wang, 1999). Authenticity is commonly used in association with the self, culture, society and even business (Vannini & Williams, 2009). Timothy and Boyd (2003) associate the concept with “presenting the past in an accurate manner”. Others use it as related to traditional culture and origins, a sense of genuineness, realness and uniqueness (Sharpley, 1994). On a more general basis, in the past years, the concept has gained popularity in tourist experience and heritage studies.

Although authenticity was introduced to the tourism field in the 1960s by Boorstin (1961), the first article focusing on the concept appeared in tourism journals only in 1986 (Nguyen & Cheung, 2016). In order to have an overview of publications on this topic, a comprehensive review of relevant studies published in tourism journals until the end of 2018 was carried out. Using SCOPUS, keywords including ‘authentic’, ‘authenticity’, ‘authenticate’ and ‘authentication’ were used to collect full-length articles.

Accordingly, there were a total of 187 articles published between 1986 and 2018 in the top 20 ranked tourism journals, as shown in Supplement Table 1. The list of journals was selected in accordance with journal ranking systems and literature, including SJR (2018), CABS (2018) and McKercher, Law, and Lam (2006). In more than 30 years of publications, over half of the studies have been published in the last 8 years, i.e. after 2010, accounting for 64% of the total number of publications. This indicates that authenticity has received much attention in recent years, with 2018 being the year with the most related publications (i.e. 23 publications, 12.3% of the total number). Top journals in terms of the number of publications on authenticity include *Annals of Tourism Research*, *Tourism Management*, *Journal of Tourism and Cultural Change*, *Current Issues in Tourism*, *Tourist Studies*, and *Journal of Heritage Tourism*.

In their recent review, Nguyen and Cheung (2016) identified the five major themes within authenticity studies, including authenticity in particular settings, different types of authenticity, authenticity and relevant concepts, the role of authenticity and the perception of authenticity. These identified themes are still applicable to recent studies on authenticity, although the common focus changed over time and varies in terms of methods. Earlier studies focused mostly on defining the concept, its various perspectives and the association to other concepts (e.g.

Cohen, 1988; Harkin, 1995; Lacy & Douglass, 2002; Wang, 1999), while later studies emphasized exploring authenticity from the perspectives of tourists/visitors, as well as its contribution to satisfaction, destination image, etc. (e.g. Cook, 2010; Meng & Choi, 2016; Mkono 2012; Xie, Wu, & Hsieh, 2012; Yi, Lin, Jin, & Luo, 2017). Most investigations of perceived authenticity and its role were predominantly approached through quantitative methods; while a further conceptualization of authenticity, its perspectives and relevant concepts were discussed largely using qualitative approaches.

Various studies on tourist perceptions of authenticity, including Chhabra (2010), Moscardo and Pearce (1999), Silver (1993) and Waitt (2000) indicated that tourists have diverse preferences and search for different forms of authentic experiences. Although various forms of authenticity have been suggested, the three most common are based on objectivism, constructivism and existentialism and have been often used to investigate the perception of authenticity (Nguyen, 2015).

As a museum-linked concept, objective authenticity advocates a “pure, frozen, original, made by locals and genuine version” of objects (Chhabra, 2012, p.1). Objective authenticity also refers to obvious features of objects, which could usually be measured (Reisinger & Steiner, 2006). Other scholars have suggested that authenticity is subjective and originates in the tourists themselves (Connell, 2007; Steiner & Reisinger, 2006). A review of various international documents on the area of heritage and conservation by Vecco (2010) revealed that the concept of authenticity was no longer linked only to the intrinsic quality of the object or heritage, but also to the ability to recognize their aesthetic, social, and historic values. Constructivist perspectives have highlighted the importance of commercialization and capitalism in forming authenticity (Chhabra, 2012;

Wang, 1999). Accordingly, the authenticity searched for by tourists is symbolic and is an outcome of social constructions (Wang, 1999). These pre-established forms of authenticity have anyhow been labeled as too simple for contemporary forms of tourism (Urry, 1991, as cited in Wang, 1999). Existential authenticity was hence proposed as a reaction to this presumed simplicity (Wang, 1999). This form of authenticity refers to an experiential and state of mind construct, which is not necessarily dependent on external objects (Wang, 1999; Chhabra, 2012). In other words, existentialists suggest that through traveling and experiencing toured activities and objects, tourists seek for their authentic selves (Wang, 1999). The two dimensions of existential authenticity include intra-personal and inter-personal (Wang, 1999). It is argued that the discussed three predominant forms of authenticity are interrelated and each one of them could not be ignored in a tourism setting (Wang, 1999; Ye *et al.*, 2018).

As the investigations of authenticity have shifted to exploring the concept from a perspective of tourists, quantitative research methods have been growing in importance. In the last five years from this publication, half of the studies solely or primarily applied a quantitative approach. It is crucial to note that these studies on authenticity often adopted a postpositivist paradigm, acknowledging possible fallacies (Trochim, 2015). Quantitative methods are therefore deemed as a suitable and often necessary approach to assess authenticity by contemporary scholars. Nevertheless, qualitative methods are still dominant, with 63% of total studies adopting this approach. This is not surprising, as the view of authenticity as a highly subjective and partly ephemeral concept has been predominant (Nguyen, 2015).

With the increasing usage of quantitative methods to examine authenticity from a tourist perspective, a reliable scale for measuring perceived authenticity is essential. Various types and

approaches for measuring authenticity, from a single measurement item, single dimensional scale to hierarchical component models, have been proposed in past studies and are discussed in the following section.

2.2. The measurement of authenticity

A considerable amount of studies has measured authenticity from a tourist viewpoint, i.e. perceived authenticity, and consequently examined its role in forming the tourist experience using quantitative methods. Various approaches for measuring perceived authenticity have been applied. Some of them utilized a single or multiple item scale of authenticity levels, including Budruk *et al.* (2008), Chhabra *et al.* (2003), Chung *et al.* (2018), Waller and Lea (1998), Wong, Ji, and Liu (2018), Xie and Wall (2002), and Yang and Wall (2009). A majority of the studies applied a single construct scale comprised of multiple items, such as Akhoondnejad (2016), Brida *et al.* (2012, 2013), Lu, Chi, and Liu (2015), Mura and Lovelock (2009), Scarpi, Mason, and Raggiotto (2019), Chhabra (2007), Jiang, Ramkissoon, Mavondo, and Feng (2017), Kim, Oh, Lee, and Lee (2018), Ram, Bjork, and Weidenfeld (2016). Multiple construct instruments were designed in other studies, such as Fu, Liu, Wang and Chao (2018), Bryce *et al.* (2015) Chhabra (2010), Kolar and Zabkar (2010), Revilla and Dodd (2003), Ye *et al.* (2018), Zatori *et al.* (2018), Yi, Fu, Yu, and Liang (2018).

In addition, most of the instruments for measuring authenticity were derived either based on the attributes of the tourist experience/ product (e.g. Fu *et al.*, 2018; Littrell, Anderson, & Brown, 1993; Mura & Lovelock, 2009; Revilla & Dodd, 2003; Scarpi *et al.*, 2019) or multiple forms of authenticity (e.g. Bryce *et al.*, 2015; Chhabra, 2010; Domínguez-Quintero, González-Rodríguez, & Paddison, 2018; Kolar & Zabkar, 2010; Yu *et al.*, 2018; Zatori *et al.*, 2018). For a tangible

tourism product, such as souvenirs, arts and crafts, object attributes have typically been used to measure authenticity. For example, Littrell *et al.* (1993) highlight 8 categories: ‘aesthetics’, ‘cultural and historic integrity’, ‘craftsperson and materials’, ‘function and use’, ‘workmanship’, ‘shopping experience’, ‘genuineness’ and ‘uniqueness or originality’; Revilla and Dodd (2003) included 5 factors ‘appearance/utility’, ‘difficult to obtain’, ‘locally produced’ ‘traditional characteristics and certification’, ‘’, and ‘low cost’; and Fu *et al.* (2018) used 3 dimensions: ‘traditional value’, ‘local production’ and ‘display’. These studies thus recognized different characteristics or features that contribute to the authenticity of a tourism product. However, these findings are best applied to tangible objects only. Tourist experiences are anyhow largely intangible, subjective and multifaceted, and therefore more complex. Hence, the definition of tourist experience has also been widely discussed (Cutler & Carmichael, 2010).

In general, the tourist experience is a psychological process that is different from everyday experiences (Cohen, 1979), related to past travel and memory (Larsen, 2007) and it involves the individual pursuit of self-realization (Selstad, 2007). For the current study, as the heritage experience focusing on the on-site element is investigated, the tourist experience is understood as an *interaction between tourists and the site* (Pine & Gilmore, 1998; Stamboulis & Skayannis, 2003). Moreover, as authenticity is involved, the experience is considered as a quasi-religious or pilgrimage-like journey (Quan & Wang, 2004). As such, experience results from the interaction between the individual’s state of mind and an object or event (Pine & Gilmore, 1998). In other words, individual imagination and intellect play a crucial role in forming these experiences (Cutler & Carmichael, 2010; Gouthro, 2011).

Perhaps due to the subjective and multifaced nature of the tourist experience, most studies measured the related perceived authenticity based on various forms or dimensions of authenticity, not on its attributes. Among the three primary forms of interrelated authenticity, i.e. objective, existential and constructive (Wang, 1999; Ye *et al.*, 2018), only the first two have been used extensively to measure the perceived authenticity of the tourist experience. An exception was Chhabra's (2010) study which successfully identified essentialist/objectivist, existentialist, constructivist, and a negotiation between essentialist and existentialist authenticity from a students' perspective. This research, however, did not focus on the perceived authenticity of heritage sites, but on heritage tourism in general. Yu *et al.* (2018) used three forms of authenticity, cognitive, constructive and relational, to measure the perception of authenticity towards a commercial home experience. However, relational authenticity can only be applicable to similar contexts, as it refers to the relationship between a host and a guest.

Although multiple forms of authenticity have been included in some studies, they are often examined separately; except Zatori *et al.* (2018), which combine constructive and existential authenticity into a higher-order construct of authenticity. Also, the three primary forms of authenticity have not yet been used conjointly to assess the overall authenticity of a tourism product or experience. It is acknowledged that different forms of authenticity might have various impacts on tourist perceptions or behaviors (Bryce *et al.*, 2015; Kolar & Zabkar, 2010; Domínguez-Quintero *et al.*, 2018). Nevertheless, in order to understand the role of authenticity or its perceived version as a whole, there is a need to examine the construct in a hierarchical component model, comprised of several lower-order dimensions. The three primary forms of authenticity, including objective, constructive and existential, should be all included. This study

thus assesses perceived authenticity in a hierarchical scale, including all three major dimensions as formative measures.

3. Research methods

3.1. A reflective – formative hierarchical component model of perceived authenticity

Hierarchical component models have been habitually used to establish measurement scales in tourism and hospitality, in studies such as Cho, Joo, and Woosnam (2020), Hung and Petrick (2010), Su, Li, Wu, and Yao (2020), Ying and Wen (2019). Most of these use a reflective approach for both, lower- and higher-order components. Reflective measures are interchangeable, unidimensional and are expected to be correlated (Freeze & Raschke, 2007). Meanwhile, multiple underlying dimensions are distinct in nature (Cheah, Ting, Ramayah, Memon, Cham, & Ciavolino, 2019). Treating higher-order components as reflective, a model could be deemed as inappropriate and “meaningless” in certain cases (Cheah *et al.*, 2019). Accordingly, considering or reconsidering the formative and reflective natures of measurement scales is crucial, especially in exploratory studies (Duarte & Amaro, 2018; Mikulić & Ryan, 2018).

As a result of the previous conceptual discussion, all three main forms of authenticity are included in this study, as each of them should not be negated in a tourism setting (Wang, 1999; Ye *et al.*, 2018). Its constructive and existential dimensions have been used in a hierarchical component model in Zatori *et al.* (2018). These dimensions were, however, treated as reflective measures, whereas they are in fact conceptually distinct. While constructive authenticity refers to an object-related and socially constructed form of authenticity, existential authenticity is activity-

based and denotes the existential state of the visitor (Wang, 1999). These forms are not interchangeable and thus should not be treated as reflective components of authenticity, but as formative measures. The development of measurement items for these lower-order components is presented in the following section.

3.2. Measurement item development

An instrument for measuring perceived authenticity was developed in four stages, adopting Churchill's (1979) procedure of measurement scale development.

Stage 1: Perceived Authenticity is measured in terms of three dimensions, including Objective, Constructive and Existential Authenticity. Firstly, as indicated above, the measures of these three dimensions are developed using a reflective approach. This means that the indicators or measurement items are developed in a way that reflects the measured construct and that they are interchangeable, signifying that the removal of an item does not change the nature of the measured construct (Freeze & Raschke, 2007). Secondly, for consistency purposes, the definitions of each type of perceived authenticity discussed in the literature were carefully scrutinized for developing the instrument. Measurement items that had been developed earlier have then been chosen based on the compatibility with these definitions. Previous studies which include scales of perceived authenticity such as Chhabra (2007), Chhabra (2010), Kolar and Zabkar (2010), Ramkissoon and Uysal (2011) were also reviewed. Finally, a total of 16 items were developed.

Stage 2: To obtain a high level of variation and depth of information, a purposive sampling technique was followed. On-site tourists with different demographic characteristics who were

available and willing to share their experiences were approached for interviews. 21 heritage tourists were recruited for in-depth interviews, coming from 11 countries, aged from 21 to 52, among them 12 were female. Tourists were approached at the heritage sites during their visits and asked for their perceived authenticity of the heritage experience and the rationale for their assessments. Possible determinants of authentic heritage experiences were identified from this procedure. The top determinants included old appearance, the presence of locals, activation of the senses (e.g. sound, smell...), spiritual atmosphere, the presence of monks, a relaxed feeling, as well as other feelings and emotions. A list of these determinants and an example of interview quotes is presented in Supplement Table 2. Findings from this stage were used to create additional measurement items. While some of these findings were present in the literature, six statements/items were new and thus added to the scale. Together with the items developed from literature, a total of 22 measurement items were designed and put forward into the next step.

Stage 3: A panel of experts including eight academic professionals with expertise in the areas of heritage tourism and authenticity was then invited to review and assess this initial list of measurement items in order to ensure its content validity. Next, the representativeness and applicability of each measurement item towards the associated construct were scrutinized. A 5-point Likert scale, ranging from “totally inapplicable” or “totally unrepresentative” to “totally applicable” or “totally representative” was used for each item. Additional comments and recommended alternatives were also provided. The total rated score of each item, as well as the experts’ comments and suggestions, were thoroughly reviewed. Accordingly, 2 items were amended, and 3 items were eliminated.

Stage 4: A total of 19 items for measuring authenticity were included in a pilot survey with a small number of respondents. This aimed at ensuring that the questionnaire was unambiguous and answerable. Both, English and Mandarin versions of the instrument were used in this pilot. This questionnaire utilizes a 7-point Likert scale of agreement. The items were then revised slightly in terms of wording for ease of comprehension. A list of all measurement items is presented in Table 1.

[Table 1 about here]

3.3. Data collection

The given questionnaire was primarily designed in English, but taking account of mainland China as the biggest inbound market for Hong Kong, another version in Mandarin was prepared (HKTB, 2014). With the assistance of student helpers from a local university, a self-administrated on-site survey was led in six heritage sites in Hong Kong. A total number of 651 valid questionnaires were finally collected. After screening, 26 cases were eliminated due to a high percentage of missing data and presence of outliers. Accordingly, a final sample size of 625 was used for data analysis.

Respondents were 54.8% female and 45.2% male. Most of them (63.5%) were in the age range of 25 to 45. Similar to common heritage tourist profiles, respondents in the current study showed a rather high educational level with around 90% holding university degrees or above. The majority of respondents (73.9%) were employed and self-employed income-earners.

Respondents came from 45 countries and territories. Around half of the respondents came from Asia (53.3%). 32.3 % of respondents were from Europe, 9.6% from America, 4.0% from

Australia/Oceania and 0.8% from Africa. Mainland China was the largest country of origin, making up 32.2% of the total respondents.

3.4. Data analysis

For the establishment and validation of the proposed scale, a partial least square structural equation modeling was applied due to the following reasons: (1) the flexibility regarding data assumptions and sample size, (2) the exploratory nature of this study, (3) a complex model which includes both reflective and formative constructs (do Valle & Assaker, 2016; Hair *et al.*, 2017; Hair, Risher, Sarstedt, & Ringle, 2019).

To examine the reflective – formative hierarchical component model (HCM) of perceived authenticity, a repeated indicators approach with 2 steps was followed (Chin, 1998; Hair *et al.*, 2017). This approach is considered to be more reliable with reflective-formative hierarchical constructs (Duarte & Amaro, 2018). Also, in the current study lower-order constructs have a similar number of indicators and the higher-order construct is proposed to be exogenous, which makes this method appropriate (Duarte & Amaro, 2018). The lower-order reflective constructs, including Objective Authenticity, Constructive Authenticity and Existential Authenticity were first assessed for reliability and validity. Reliability was tested using the outer loadings and composite reliability, while validity was examined using the average variance extracted (AVE) (Hair *et al.*, 2017). The higher-order formative construct of Perceived Authenticity was then analyzed. The weights of all lower-order components and multicollinearity issues were examined. The measurement model invariance was also tested. Additionally, in order to further examine the scale's ability to predict tourist satisfaction, a structural model, comprised of a higher-order construct of perceived authenticity and tourist satisfaction, was tested. Its path

coefficients, the coefficient of determination (R^2 value) and the effect size (f^2 and Q^2) were observed. Data analysis was conducted using SmartPLS 3 and SPSS 23.0.

4. Findings

4.1. The measurement model

Among the measurement items, “The site includes artificial elements” caused inauthentic experiences and is opposite to the rest of the scale. This item, therefore, was treated as reverse-coded.

In order to explore the dimensions of Perceived Authenticity, all 19 measurement items created in the previous stages were analyzed using Principal Component Analysis (PCA) with Varimax Rotation. This analysis was conducted with the first set of the data, comprising of 125 observations. The reverse-coded item was eliminated from the analysis due to low factor loadings. The new PCA identified 3 factors: Objective Authenticity, Constructive Authenticity and Existential Authenticity, explaining 54.893% of the overall variance. A KMO value of 0.785 indicated a sampling adequacy for the analysis (Kaiser, 1974). All items were loaded on the proposed factors. Factor loadings of all items ranged from 0.423 to 0.864, being greater than the 0.4 threshold, hence convergent validity was achieved (Field, 2009). Cronbach’s alpha values of three factors, i.e. 0.852, 0.802 and 0.756, were satisfactory (Field, 2009). The dimensions and their items identified were then used to examine the HCM in the next steps, with the second set of the data comprising of 500 observations.

As indicated in the previous sections, with the support from literature, the measurement model was presumed to be a reflective – formative HCM. Nevertheless, it is suggested that empirical

evidence could be provided by a confirmatory tetrad analysis (CTA) to determine the reflective or formative nature of the measures and help to avoid the misspecification of the measurement model (Gudergan, Ringle, Wende, & Will, 2008; Hair, Sarstedt, Ringle, & Gudergan, 2018). As a large sample size could easily lead to a rejection of the reflective model (Cheah *et al.*, 2019). This analysis was thus applied for a moderate random sample of 150 observations. Additionally, as there were only three lower-order components, an indicator of the endogenous construct, i.e. Satisfaction, was borrowed as suggested by Gudergan *et al.* (2008). Results of CTA, as shown in Supplement Table 3, indicate that all tetrad values of three lower-order components, i.e. Objective Authenticity, Constructive Authenticity and Existential Authenticity, vanished in the assessment (i.e. the confident intervals included zero and insignificant); indicating the reflective measures of these components. Meanwhile, one tetrad value of the higher-order construct, i.e. Perceived Authenticity, failed to vanish, suggesting the formative nature of the construct. Accordingly, these results empirically support the proposed reflective – formative HCM.

Two steps of analysis with repeated indicators approach were followed to evaluate the model (Chin, 1998; Hair *et al.*, 2017). In step 1, the reflective lower-order components including Objective Authenticity, Constructive Authenticity and Existential Authenticity were examined. All 18 items remaining from the previous stage were included in the model, of which 6 items measuring Objective Authenticity (Aut1 → Aut7), 6 items measuring Constructive Authenticity (Aut8 → Aut13) and 6 items measuring Existential Authenticity (Aut14 → Aut19).

Although the acceptable value for factor loadings should be 0.708, Hair *et al.* (2017) suggest that items loading between 0.4 and 0.7 if deleted, would increase the composite reliability or the AVE. In the first analysis, Aut19 had a loading of 0.404 and the AVE value of Existential

Authenticity was marginally below 0.5. This item was therefore deleted. In a new analysis, the values of Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE) were above the thresholds (0.7; 0.7 and 0.5, respectively) (Hair *et al.*, 2017), as shown in Table 2. Most of the loadings were above 0.7, except for Aut5, Aut7, Aut8, Aut9, Aut14 and Aut18, with values ranging from 0.635 to 0.680. Nonetheless, the deletion of these items did not significantly change the CR or AVE values. Thus, all items were retained to maintain content validity of the lower-order components. The retaining of these items is not an exception in the social sciences, where outer loadings of less than 0.70 are often obtained; especially when newly developed instruments are used (Hulland, 1999).

[Table 2 about here]

Discriminant validity, according to the Fornell-Larcker criterion, was also successfully established, as the square root of each lower-order construct's AVE was higher than its correlation values with other constructs (as shown in Table 3) (Hair *et al.*, 2017). In addition, the Heterotrait-Monotrait ratios of correlations (HTMT) of the three lower-order constructs were well below the threshold of 0.85, indicating the constructs achieving discriminant validity (Hair *et al.*, 2017) (as shown in Supplement Table 4). Additionally, the 5000 samples bootstrapping procedure was executed to construct confidence intervals for the HTMT. The 95 percent bias-corrected and accelerated (BCa) confidence intervals of the HTMT did not contain the value one, suggesting the lower-order constructs were empirically distinct (Henseler, Ringle, & Sarstedt, 2015).

[Table 3 about here]

In step 2, in order to validate the formative higher-order construct, the weights of three lower-order components and their significance were first examined. The results indicate that the weights of all lower-order components were over 0.1, as shown in Figure 1 and Table 4.

Constructive Authenticity had the strongest effect on Perceived Authenticity, with a weight of 0.482, closely followed by Objective Authenticity with a weight of 0.472 and Existential Authenticity with a weight of 0.358. Through a bootstrapping procedure with 5000 samples, the t-statistics of well above 1.96 and the 95 percent bias-corrected and accelerated (BCa) confidence intervals (as shown in table 4) indicate the significance of the lower-order components' weights. Multicollinearity of the indicators was also assessed using a variance inflation factor (VIF) (Hair *et al.*, 2017). VIF values of all lower-order components were well below the recommended value of 5 (Hair *et al.*, 2017). The above two-step analysis indicates the validity and reliability of the proposed reflective-formative HCM of Perceived Authenticity of heritage experience.

[Figure 1 about here]

[Table 4 about here]

To further ensure the validity and reliability of the model, measurement invariance was assessed. The establishment of measurement model invariance helps to strengthen the power of statistical tests, as well as validating the outcomes (Hair *et al.*, 2017). The current study involves a wide range of respondent groups, especially in terms of nationality, age and other characteristics. Previous studies on inbound tourists in Hong Kong indicated differences between short-haul and long-haul tourists in terms of behaviors and perceptions, suggesting the impacts of cultural distance (McKercher & Chow, 2001; McKercher, 2008). This was therefore considered as a

potential source of heterogeneity of the measurement model. In the current study, short-haul tourists were regarded as those from Asian countries (n=243) and long-haul tourists were those from non-Asian countries (n=257). The three-step MICOM (measurement invariance of composite models) procedure by Henseler, Ringle and Sarstedt (2016) was then followed to test the measurement invariance of the model. The configural invariance (step 1) was established as the setup of the measurement model, data treatment and algorithm settings were identical for both groups. To assess compositional invariance (step 2) and equal composite mean values and variances (step 3), a permutation test with 5000 permutations was ran (Henseler *et al.*, 2016). The results of the three steps, as shown in Supplement Table 5, indicate the full measurement invariance established.

4.2. The predictive power of the measurement scale of perceived authenticity

To further validate the scale as well as to examine its predictive power, its influence on tourist satisfaction was assessed in the structural model presented in Figure 1. The measurement scale of Tourist Satisfaction was deemed as valid and reliable since its factor loadings range from 0.575 to 0.883, a Cronbach's alpha of 0.844, a composite reliability of 0.891, AVE of 0.626, and HTMT less than 0.85.

The path between Perceived Authenticity and Tourist Satisfaction was examined in terms of the significance of path coefficients, coefficient of determination (R^2), effect size (f^2) and construct crossvalidated redundancy (Q^2). An analysis using the bootstrapping method with 5,000 iterations indicated that the path coefficient of 0.434 is significant, with t statistics of 9.631, indicating that Perceived Authenticity has a significant effect on Tourist Satisfaction. The effect size f^2 of 0.232 indicated a strong effect of Perceived Authenticity on Tourist Satisfaction (Hair

et al., 2017). In addition, an analysis using blindfolding with 7 iterations resulted in a construct crossvalidated redundancy Q^2 value of 0.106, signifying the predictive relevance of this model (Hair *et al.*, 2017). The coefficient of determination R^2 value was 0.189, demonstrating that 18.9% of the variability of Tourist Satisfaction was explained by Perceived Authenticity.

5. Discussion and conclusion

While examining authenticity using a quantitative approach has become more popular in tourism scholarship, hitherto there is no comprehensive instrument of measure; highlighting the multifaceted complexity of the concept and the tourist experience as a whole. In order to amend this gap, this study developed a reliable and comprehensive scale to measure the perceived authenticity of heritage experiences. Grounded in theory, objective authenticity, existential authenticity and constructive authenticity were used as three lower-order components of perceived authenticity. This research thus applied four steps of scale development adapted from Churchill's (1979) procedure, including (1) developing items from literature, (2) adding new items results from in-depth interviews, (3) reviewing items by a panel of experts, and (4) a pilot survey. Finally, applying a PLS-SEM approach, this study successfully developed and validated a reflective – formative HCM of Perceived Authenticity.

The proposed formative scale of Perceived Authenticity comprises of the three reflective components of Objective Authenticity, Constructive Authenticity and Existential Authenticity. The developed measures in this study provide thus a more detailed understanding of heritage experience authenticity and its relevant dimensions. Literature asserts that objective authenticity is rather simple and can be measured (Reisinger & Steiner, 2006). The proposed scale indicates that objective authenticity of heritage experiences essentially refers to the *appearance and*

documentation of the heritage site. These are tangible features of the heritage experience.

Nevertheless, the concept of authenticity does not only link to the consistency of the object and heritage or its intrinsic quality (Vecco, 2010). It is also based on a more subjective view, which refers to the constructive authenticity, suggesting a social construction (Wang, 1999). This measure illustrates that the constructive authenticity of heritage experiences reflects the *activity within the heritage sites and of the visitors*. It also characterizes the close relation of these activities to the local culture and community. Existential authenticity denotes a *state of mind* (Wang, 1999), which is emotional, spiritual and relaxing. With the elimination of Aut19, this scale did not successfully include the second dimension of existential authenticity, i.e. interpersonal or authentic and intimacy relationships within family ties and touristic communities (Wang, 1999). It is subsequently likely that heritage visitors in the studied sites focus more on their relationship with heritage, rather than with their peers and companions.

Results related to the weights of the three lower-order components suggest that Objective Authenticity and Constructive Authenticity have a slightly stronger influence on Perceived Authenticity than Existential Authenticity. A similar finding was shown in Chhabra's (2010) work, where an objectivist view of authenticity prevailed among students and existentialist perspectives were rarely evident. In the current study, the experience of visiting tangible heritage was examined and sightseeing was the most common activity. Considering this, a connection with self or self-discovery - which constitutes existential authenticity - might not be as important as other factors in assessing the authenticity of the heritage experience.

To further validate the scale of perceived authenticity, its predictive power over tourist satisfaction was estimated. The results show a significant predictive relevance of this model and

a significant positive influence on tourist satisfaction. However, it only explained for about one-fifth of the variability of tourist satisfaction. The relatively low coefficient of the determination R^2 value can be explained by the fact that tourist satisfaction is a complex construct, in which the perception of authenticity most likely only plays a minor role. Other factors that also affect tourist satisfaction include tourist expectation, perception of service quality and value, tourist motivation, emotion, etc. (Bowen & Clarke, 2002; Chen & Chen, 2010; de Rojas & Camarero, 2008; Lee, Jeon, & Kim, 2011; Wang, Zhang, Gu, & Zhen, 2009, Yoon & Uysal, 2005). In a qualitative study related to Hong Kong heritage, Nguyen (2015) found that aesthetics and novelty were other important elements that contribute to the heritage tourist experience. Nonetheless, considering the numerous influential factors on tourist satisfaction, with the R^2 value of 18.9%, it is shown that perceived authenticity has a significant explanatory power over tourist satisfaction, particularly in the context of heritage experiences.

Considering the aforementioned debates on authenticity, this study is also likely to draw criticism. Authenticity is considered to be highly individualistic and subjective by nature (Connell, 2007; Steiner & Reisinger, 2006). Therefore, studies examining this concept are often using a qualitative approach. However, there are arguments in support of the study findings. The perception of authenticity towards heritage experiences from a tourist perspective, not its standalone concept, was measured. From a marketing and management standpoint, authenticity is often taken as an evaluative concept, such as the value and quality of an experience (Kolar & Zabkar, 2010). Particularly for service quality, being also a subjective and complex evaluative notion, measurements have been developed and applied in various contexts and sectors within the tourism and hospitality industries; for example, SERVQUAL (Parasuraman, Zeithaml, & Berry, 1985, 1988), HISTOQUAL (Frochot & Hughes, 2000) and DINESERV (Stevens,

Knutson, & Patton, 1995). Considering the success of these models of perceived service quality, the present study can offer a steppingstone towards refining the proposed scale for authenticity across different contexts and places.

The proposed scale can also help future studies as well as heritage site managers to measure authenticity from a tourist perspective. It also facilitates a quantitative assessment of the role of authenticity in tourist experience within consumer-based models. Additionally, the present study is among the few empirical studies including various conceptualized forms of authenticity concurrently in a type II, i.e. reflective-formative hierarchical component model. This does not only enable future studies to measure overall authenticity, but also helps to identify the form(s) of authenticity which is/are considered as the closest reflection of tourists' personal perceptions of an authentic heritage experience.

Despite substantial efforts, this study is not without limitations. Firstly, the convenience sampling approach adopted in the current study is problematic. With this sampling technique, respondents were approached based on their availability and/or approachability - which could create bias. Nonetheless, this was believed to be the most feasible approach for an on-site tourist survey. Secondly, the single studied destination, i.e. Hong Kong, could result in another limitation, as the unique feature of heritage tourism in this cosmopolitan city might weaken the ability of generalization and inference to other destinations/populations. However, this is a first attempt to develop a formative and hierarchical scale for the perceived authenticity of heritage experiences. Other types of destinations, especially where heritage tourism is an essential tourism product as well as important motivation to visit, are encouraged to be chosen for validating this scale. Thirdly, the measure of existential authenticity did not contain the inter-

personal dimensions suggested by Wang (1999). Future scales, thus, should include more items related to inter-personal existential authenticity. Intra-personal and inter-personal dimensions could then be treated as formative lower-order measures of existential authenticity. Additionally, the recent call for attention to the eudaimonic tourist experience leading to personal growth and development (Knobloch, Robertson & Aitken, 2016) is relevant to examine existential authenticity as a *journey of seeking* for an authentic self. According to Knobloch *et al.* (2016), the tourist experience is beyond hedonic enjoyment, as negative emotions could also result in positive experiences and a more profound understanding of one's self. Future studies of existential authenticity could explore both hedonic and eudaimonic experiences and include negative emotions in its measurement scale.

Lastly, an assessment of convergent validity for the formative measurement model by redundancy analysis (Chin, 1998) was not held for this study. While this analysis is important for validating the formative measurement model, many researchers failed to report it (Ali, Rasoolimanesh, Sarstedt, Ringle, & Ryu, 2018). The reason might be that this analysis requires a prior design of a reflective measure of multiple items, or a global single item of the same construct, together with the current scale (Hair *et al.*, 2017). This adds complication to the research, particularly related to the survey length. Nevertheless, a recent study by Cheah, Sarstedt, Ringle, Ramayah and Ting (2018) proves the sufficiency of the use of a global single item and provides a guideline for this approach. The advantages of a single item approach in redundancy analyses are hoped to encourage researchers to conduct and report this important assessment of the formative measurement model (Cheah *et al.*, 2018).

In conclusion, with the aim to develop a measurement scale for the perceived authenticity of heritage experiences, this study successfully established a reliable hierarchical component model of perceived authenticity. In this model, the lower-order components include the major three dimensions of authenticity, i.e. Objective Authenticity, Constructive Authenticity, and Existential Authenticity. These were treated as reflective measures, while the higher-order component of Perceived Authenticity was formatively measured by its three lower-order components. This model was also indicated to have significant predictive power for tourist satisfaction, confirming the essential role of authenticity in the tourist experience. Despite a few limitations, this formative and hierarchical scale for the perceived authenticity of heritage experiences is a foundation for more comprehensive scales of perceived authenticity in various tourism contexts.

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Table 1. The development of measurement items and its proposed dimensions

Code	Measurement items	Adapted from
Aut1	The site represents the past of Hong Kong	Chhabra (2007) & interviews
Aut2	The site is kept from the actual period when it was built	Chhabra (2007)
Aut3	The site is true to its original	Chhabra (2007)
Aut4	The site is verified by historians/ authorities	Chhabra (2007)
Aut5	The site has a documented history	Chhabra (2007)
Aut6	The site includes artificial elements (reversed item)	Casteran & Roederer (2013) & interviews
Aut7	The site is old and ancient	Interviews
	The site is an authentic reproduction of the original	Chhabra (2007)
Aut8	The site presents the idea of local culture	Interviews
Aut9	The site is still in use for its original purposes	Interviews
Aut10	The site represents the local community	Chhabra (2007)
Aut11	The site represents local ways of life	Ramkissoon & Uysal (2011)
Aut12	The site allows for interaction with local community	Ramkissoon & Uysal (2011) & interviews
Aut13	The site offers the opportunity to experience local culture and customs	Brida, Disegna & Osti (2012) & interviews
Aut14	I enjoy the unique religious and spiritual experience	Kolar & Zabkar (2010) & interviews
Aut15	I like the calm and peaceful atmosphere during the visit	Kolar & Zabkar (2010) & interviews
Aut16	I enjoy myself during this experience	Wang (1999)
Aut17	I feel relaxed during this visit	Wang (1999) & interviews
Aut18	This experience gives me a strong emotion	Interviews
Aut19	I enjoy being together with my companions	Wang (1999)
	I feel people around me are relaxed	Interviews
	My senses (such as sight, hearing, touch, smell, taste) let me know this is an authentic experience	Interviews

* Items with the strikethrough are ones that were eliminated in stage 4

Table 2. The reflective lower-order measurement model analysis

	Outer loading	Cronbach's α	CR	AVE
Objective Authenticity		0.830	0.876	0.544
Aut1	0.729			
Aut2	0.783			
Aut3	0.829			
Aut4	0.758			
Aut5	0.665			
Aut7	0.642			
Constructive Authenticity		0.861	0.897	0.596
Aut8	0.680			
Aut9	0.662			
Aut10	0.871			
Aut11	0.867			
Aut12	0.789			
Aut13	0.737			
Existential Authenticity		0.781	0.853	0.540
Aut14	0.635			
Aut15	0.761			
Aut16	0.814			
Aut17	0.785			
Aut18	0.665			

Table 3. Discriminant validity - the Fornell-Larcker criterion

	ConAut	ExiAut	ObjAut
ConAut	0.772	-	-
ExiAut	0.294	0.735	-
ObjAut	0.466	0.311	0.737

* ConAut: Objective Authenticity; ExiAut: Constructive Authenticity; ObjAut: Existential Authenticity

Table 4. The formative higher-order measurement model analysis

	Weights	T Statistics	95% BCa confidence intervals	VIF
ConAut	0.482	11.004	0.430 – 0.541	1.318

ExiAut	0.358	11.066	0.295 – 0.422	1.143
ObjAut	0.472	19.778	0.427 – 0.522	1.334

Supplement Table 1. Number of articles on the topic of authenticity published in tourism journals between 1986 and 2018

Asc.	Journal	Frequency	Percent
1	Annals of Tourism Research	50	26.7
2	Tourism Management	17	9.1
3	Journal of Tourism and Cultural Change	15	8.0
4	Current Issues in Tourism	13	7.0
5	Tourist Studies	13	7.0
6	Journal of Heritage Tourism	12	6.4
7	Journal of Sustainable Tourism	8	4.3
8	Tourism Culture & Communication	8	4.3
9	International Journal of Tourism Research	7	3.7
10	Tourism Analysis	7	3.7
11	Journal of Travel Research	6	3.2
12	Tourism Geographies	6	3.2
13	Tourism Recreation Research	6	3.2
14	Asia Pacific Journal of Tourism Research	4	2.1
15	Journal of Hospitality and Tourism Research	4	2.1
16	Journal of Travel & Tourism Marketing	4	2.1
17	Scandinavian Journal of Hospitality and Tourism	2	1.1
18	Tourism and Hospitality Research	2	1.1
19	Tourism Planning and Development	2	1.1
20	International Journal of Heritage Studies	1	0.5
Total		187	100.0

Supplement Table 2. A list of determinants of (in)authentic experiences and example quotes

No.	Determinants of (in)authentic experiences	Quotes
1	Old, ancient, in ruins	<p><i>“Then see really old cultural attractions. It is really an authentic thing to do”</i></p> <p><i>“For me, if it looks older, it feels more authentic”</i></p>
2	Presence of locals	<p><i>“Because when I walked in, I saw local people praying”</i></p>
3	Presence of monks	<p><i>“I can see the monks, who belong to the temple, walking around”</i></p>
4	Presentation of the idea of local culture/customs	<p><i>“I like to experience what local people experience. A lot of Hong Kong people come here, so I also want to see, I want to do what they do”</i></p> <p><i>“When you walk in, you are just a stranger. And I tried to discover what they were doing, they explained to me, but it wasn’t clear. So, I was thinking why they didn’t provide small books or brochures telling about this. But maybe this is negative to the authenticity. So yes, it’s definitely authentic”</i></p>
5	Interaction with locals	<p><i>“I have a local friend here and I think it was more authentic when I went for lunch with her and then see really old cultural attractions. It is really an authentic thing to do”</i></p>
6	Senses (sound, smell...)	<p><i>“It’s not noisy, you can calm down, the smell of the incense. Yes, with all the senses, the sum of all your surroundings”</i></p>
7	Spiritual atmosphere	<p><i>“It is something that is spiritual, you can feel it. It’s different, it’s something more personal”</i></p>
8	Relaxed feeling	<p><i>“I feel relaxed, different from competitive urban life”</i></p>

		<i>“I feel more relaxed and forget about other things. There are many people praying there, incense is everywhere”</i>
9	Escapist feeling	<i>“I can forget about day to day life and just feel the moment, just enjoy the moment. Escape from day to day life, from what you are used to do”</i>
10	Calm/peaceful feeling	<i>“Special atmosphere that you can simply feel the situation, you don’t need to worry about anything. It’s just you and you can think about what you want, you don’t have to think about worries, deadlines. You just go there and relax, but not in the way someone tells you to calm down, do not have to worry. So it’s just like peace. It’s difficult to explain”</i>
11	Other emotions/feelings	<i>“And it’s unbelievable. I think it’s a very very great thing people have to see”</i> <i>“I felt good, I didn’t feel like being pushed or need to do something or buy something”</i> <i>“We are really happy, because we find something interesting everywhere”</i> <i>“That’s was interesting, more than interesting...”</i>
12	Other people’s expressions/activities	<i>“I felt relaxed, and it was because people around me were like that, they were relaxed about what they are doing”</i>
13	Original purposes/buildings/sites	<i>“This kind of temple has to be reconstructed by copying the original. So, I don’t expect 100% original, but I expected the original idea”</i> <i>“When we went to the heritage trail, it’s totally different. They have houses around, it is not so beautiful. But people are around. And you see it is old, actually. It is</i>

		<i>renovated, but it's simple to see that it is something which was here for a long time and some people were still using it"</i>
14	Artificial/modern elements	<i>"And I think it is definitely not the most authentic place. From the look, from the surrounding, it is very much man-made. Well, actually, the temple is man-made. But here, there is a lot of artificial stuff"</i> <i>"It is too modern. When describing the history, the existence of modern elements couldn't make it real"</i>

Supplement Table 3. Assessment of confirmatory tetrad analysis

Construct	Model-implied non-redundant vanishing tetrad	Tetrad value	Confident interval (adj.)		Supported (reflective)
			LB	UB	
Constructive Authenticity	1: Aut10,Aut11,Aut12,Aut13	0.335	-0.171	0.853	Yes
	2: Aut10,Aut11,Aut13,Aut12	0.445	-0.026	0.933	
	4: Aut10,Aut11,Aut12,Aut8	0.303	-0.208	0.815	
	6: Aut10,Aut12,Aut8,Aut11	0.049	-0.199	0.301	
	7: Aut10,Aut11,Aut12,Aut9	-0.080	-0.519	0.360	
	10: Aut10,Aut11,Aut13,Aut8	0.126	-0.243	0.498	
	16: Aut10,Aut11,Aut8,Aut9	0.162	-0.215	0.540	
	22: Aut10,Aut12,Aut13,Aut9	0.113	-0.147	0.378	
Existential Authenticity	1: Aut14,Aut15,Aut16,Aut17	0.017	-0.282	0.317	Yes
	2: Aut14,Aut15,Aut17,Aut16	0.112	-0.175	0.406	
	4: Aut14,Aut15,Aut16,Aut18	-0.033	-0.206	0.140	
	6: Aut14,Aut16,Aut18,Aut15	-0.190	-0.568	0.174	
	10: Aut14,Aut16,Aut17,Aut18	0.173	-0.030	0.381	
Objective Authenticity	1: Aut1,Aut2,Aut3,Aut4	0.196	-0.063	0.464	Yes
	2: Aut1,Aut2,Aut4,Aut3	-0.108	-0.646	0.428	
	4: Aut1,Aut2,Aut3,Aut5	0.050	-0.118	0.220	
	6: Aut1,Aut3,Aut5,Aut2	-0.014	-0.233	0.207	
	7: Aut1,Aut2,Aut3,Aut7	0.199	-0.055	0.457	
	10: Aut1,Aut2,Aut4,Aut5	0.137	-0.175	0.455	
	16: Aut1,Aut2,Aut5,Aut7	0.155	-0.140	0.459	
	22: Aut1,Aut3,Aut4,Aut7	-0.129	-0.406	0.144	
	26: Aut1,Aut3,Aut7,Aut5	0.089	-0.187	0.369	
Perceived Authenticity	1: ConAut,ExiAut,ObjAut,Satisfaction	-0.145	-0.300	-0.007	No
	2: ConAut,ExiAut,Satisfaction,ObjAut	0.019	-0.043	0.086	

Supplement Table 4. Discriminant validity - Heterotrait-Monotrait Ratio (HTMT)

	HTMT values	95% BCa confidence intervals
ExiAut -> ConAut	0.350	0.254 – 0.445
ObjAut -> ConAut	0.540	0.435 – 0.633
ObjAut -> ExiAut	0.383	0.275 – 0.483

Supplement Table 5. Results of invariance measurement testing, applying the MICOM procedure

Constructs	Step 1	Step 2		Partial measurement invariance established	Step 3				Full measurement invariance established
	Configural invariance (Same algorithms for both groups)	Compositional invariance			Equal mean values and variances				
		<i>c</i>	Confidence Intervals		Equal mean values		Equal variances		
					Differences	Confidence Intervals	Differences	Confidence Intervals	
ConAut	Yes	1.000	0.999 - 1.000	Yes	0.104	-0.186 - 0.178	-0.182	-0.279 - 0.263	Yes
ExiAut	Yes	0.997	0.991 - 1.000	Yes	-0.089	-0.186 - 0.179	0.103	-0.304 - 0.321	Yes
ObjAut	Yes	1.000	0.997 - 1.000	Yes	0.087	-0.178 - 0.172	-0.119	-0.254 - 0.268	Yes
Perceived Authenticity	Yes	0.998	0.995 - 1.000	Yes	0.063	-0.177 - 0.183	-0.067	-0.298 - 0.279	Yes