

# **Artificial Intelligence Personalization of Olive Oil Tourism: An Empirical Study of Authenticity, Satisfaction, and Loyalty**

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## **ABSTRACT:**

The given paper analyses how perceived authenticity interacts with tourist satisfaction and loyalty in the Tunisian oleotourism and evaluates the mediation impact of AI-enabled personalization on these associations. Based on the Stimulus-Organism-Response paradigm (S-O-R), Service-Dominant Logic, and technology acceptance theory, we develop a combined conceptual framework, and test its validity empirically. The results based on 450 oleo tourists spread among five main olive-producing regions in Tunisia were analyzed using exploratory and confirmatory factor analysis, then structural equation modelling. The findings derived thereof suggest that perceived authenticity has a strong positive impact on visitor satisfaction and loyalty, and that satisfaction is a strong partial mediator. More importantly, the impact of authenticity on satisfaction is increased by the introduction of AI-enhanced personalization and the relationship between satisfaction and loyalty is reinforced, which implies that carefully conceived AI-enabled tools complement instead of weaken authentic cultural experiences. The research provides a list of practical recommendations directed to oleotourism operators, destination marketing practitioners and policymakers who are keen on using artificial intelligence technologies to enhance visitor experiences, create loyalty and support the growth of rural tourism businesses.

**Keywords:** Artificial Intelligence; Personalization; Oleotourism; Perceived Authenticity; Tourist Satisfaction; Tourist Loyalty; S-O-R Model.

## INTRODUCTION

Tourism is one of the pillars of economic systems worldwide, playing an important role in gross domestic product, job creation, and geographical development of various areas (UNWTO, 2023; Gossling et al., 2020). In spite of its economic value, the recent boom in tourism activities has resulted in complex sustainability issues, which include the decline of the environment, the loss of cultural background, and the unsustainable use of natural resources (Hall, 2019; Higgins-Desbiolles, 2020; Lenzen et al., 2018). In this regard, the notion of sustainable tourism has become an essential paradigm, which promotes the balance between economic affluence, environmental conservation, and socio-cultural integrity (Saarinen, 2022; Boluk et al., 2019). Specialized tourism typologies have emerged within this sustainability transition to meet the changing consumer demands of seeking meaningful and experiential travel experiences (Richards, 2021). Hence, Oleotourism, also known as olive-oil tourism, is a particular type of agri-food tourism that combines the agricultural heritage, rural terroir, and culinary immersion (Millan et al., 2022; Fuste-Forne, 2020). This type of specialized tourism includes informational experiences, including guided tours of oil-growing areas, observation of both modern and traditional methods of oil-extraction, workshops of sensory assessment, and direct contact with the local producers (Sanchez-Canizares et al., 2021). The fact that oleotourism enhances natural interactions between tourists and the rural communities shows that there is a significant potential to stimulate the local economies, preserve intangible cultural heritage, and develop territorial attachment (Lopez-Guzman and Sancera-Canizares, 2023; Presenza and Cipollina, 2010). Its evolution pattern corresponds to the reported paradigmatic change in tourist motivations in favour of authenticity-seeking, nature-based tourism, and cultural immersion (Sigala, 2019; MacCannell, 2013).

The Tunisian case is a rather relevant empirical environment to study the dynamics of oleotourism. Tunisia is also one of the largest producers of olive oil in the world and it has about 1.8 million hectares of land under olive production. That fact makes of this industry one of the centers of the national economy in terms of rural living and the competitiveness of exports (International Olive Council, 2023; Ben Abdallah et al., 2020). In addition to its economic aspect, the olive tree is one of the country's cultural attributes and its historical background firmly rooted in the memory of the population and territorial representations (Zouari et al., 2019). In this respect, the strategic growth of oleotourism is a consistent policy response to enrich the Tunisian tourism sector beyond the traditional models of coastal mass tourism to offerings that are more sustainable, experiential, and value-added (Hazbavi et al., 2022; Dhrif and Bakari, 2021).

To ensure the long run viability of specialized tourism programs in terms of destination marketing, tourist satisfaction and destination loyalty are essentially key determinants (Chen and Chen, 2010). Satisfaction as a post-consumption cognitive-affective judgement based on expectancy-disconfirmation processes (Oliver, 2014) serves as a thoroughly proven antecedent of loyalty, a multidimensional construct consisting of behavior intentions such as destination revisitation, positive recommendation, and sustained engagement through word-of-mouth promotion (Rather et al., 2022; Zeithaml et al., 1996). In the context of experiential tourism, perceived authenticity is a critical determinant of satisfaction that is described by tourists as the subjective evaluation of experiential authenticity, cultural integrity, and historical truth (Kolar and Zabkar, 2010; Wang, 1999). Contemporary studies always reveal that authenticity perceptions are effective predictors of the satisfaction and loyalty in the cultural heritage and gastronomic tourism sectors (Bryce et al., 2023; Park et al., 2023; Mkono and Markwell, 2014).

Simultaneously, the modern tourism sector is undergoing a digital revolution, which is gradually being mediated by AI-based applications. The AI-driven personalization, which is operationalized as artificial intelligence recommendation systems, chatbots, predictive analytics, and adaptive content delivery, radically restructures service delivery, maximizes operational efficiency, and enhances experience (Ivanov and Webster, 2023; Tussyadiah, 2020; Buhalis et al., 2019). Although the influence of AI has been widely reported in the mainstream tourism setting, its potential application in boosting the authenticity-based, culture-specific experiences, including oleotourism, is still cursory (Ukpabi et al., 2023; Neuhofer et al., 2021).

In spite of the potential oleotourism has been recognized with, the existing literature has shown a significant gap. To be more specific, there is a lack of integrative empirical studies to explore the effect of perceived authenticity on satisfaction and loyalty in this particular niche (Fuste-Forne & Jamal, 2021). Moreover, there is a lack of studies examining the possible mitigating effects of AI-based personalization to these underlying relationships, which is also another significant research gap in the context of experiential tourism and digital innovation (Buhalis and Sinarta, 2019).

Filling this gap, this study develops and empirically supports a comprehensive conceptual model, which defines AI-enabled personalization as a critical threshold situation, and thus moderates the authenticity-satisfaction-loyalty nexus of Tunisian oleotourism. The present investigation provides valuable theoretical insights, by blending Service-Dominant Logic (Vargo and Lusch, 2016), the Stimulus-Organism-Response paradigm (Mehrabian and Russell, 1974), and the Technology Acceptance constructs (Venkatesh et al., 2003). At the same time, it is useful in generating actionable strategic information to destination management organizations, olive-oil producers, and tourism policymakers who seek to use digital technologies to contribute to sustainable rural development and destination differentiation.

## **LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT**

### **1. Olive-Oil Tourism**

Olive-oil tourism, commonly referred to as oleotourism in the academic community, is a particular type of agri-food tourism that has merged agricultural heritage, aesthetic appreciation of rural scenery, and gastronomic experiential consumption in the form of the production and consumption of olive-oil products and their culture (Kim and Lee, 2023; Xu and Gursoy, 2023; Ellis et al., 2018). Oleotourism participants engage in a range of oleotourism activities that may involve guided tours in olive groves, observation of traditional and mechanized milling process, participation in seasonal harvesting, sensory evaluation workshops and direct purchases of the artisans (Bagheri et al., 2023; Cracolici and Nijkamp, 2009). Such participatory experiences would not only enable substantive links between visitors and the host communities but would also create economic multiplier impacts in the rural lands (Torres & Momsen, 2011).

Authenticity is one of the central constructs of the oleotourism experience, defined by the level to which the tourism experience is perceived by the tourists as authentic, culturally salient, and presented in a traditional way of local practises (Bagheri et al., 2023; Steiner and Reisinger, 2006). Real-life experiences are recognized as key drivers of satisfaction and behavioural loyalty, especially in niche and experiential tourism segments where symbolic value is the main factor (Kim and Lee, 2023; Ramkissoon and Uysal, 2011).

Moreover, oleotourism plays a significant role in sustainable territorial development by conserving rural cultural heritage, creating a variety of income sources to agricultural communities and encouraging production practices which are environmentally friendly (Kastenholz & Lima, 2022; Lane, 1994). In the Tunisian context where olive farming occupies about 1.9 million hectares and is a strategic export industry, oleotourism is a lucrative source of diversification of the tourist portfolio and cultural-economic enrichment of the region (Xu and Gursoy, 2023; Ben Youssef and Abderrazak, 2021).

## **2. Stimulus-Organism-Response Framework**

The S-O-R model is based on environmental psychology (Mehrabian and Russell, 1974) and offers a strong theoretical process that explains the psychological process leading to behavioral reactions. In this model, environmental or experience stimuli (S) affect internal psychological conditions, the organism (O) and in turn cause behavioral reactions (R) (Jacoby, 2002). When applied to oleotourism, perceived authenticity is the external stimulus that triggers tourists' internal cognitive-affective states, namely satisfaction (organism) which, in its turn, precipitates behavioral reactions in the form of loyalty (Kim and Hall, 2019; Su et al., 2020).

## **3. AI Integration and Technology Acceptance in Tourism.**

The Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh and colleagues (2003) is an inclusive theoretical model that can be followed to study the adoption and use of technology-based services by tourists. Hence, artificial intelligence technologies including chat bots, intelligent recommendation system, predictive personalization engine, and immersive augmented-reality applications, show great potential to augment the experiential personalization, improve operational service performance, and enhance visitors' level of satisfaction (Lopez-Naranjo et al., 2025; Huang and Rust, 2021). Yet, despite the significant academic interest in AI applications in mainstream tourist settings, the use of these technologies in specialized cultural and gastronomic tourism sectors, especially oleotourism, has been empirically under-investigated (Ivanov et al., 2020; Gretzel et al., 2015).

## **4. Perceived Authenticity, Satisfaction, and Loyalty**

The perceived authenticity construct is a multidimensional concept of critical significance related to the area of heritage and gastronomic tourism. It reflects the subjective estimation of the authenticity, novelty and historical accuracy of the experiences that visitors undergo (Kolar and Zabkar, 2010; Cohen, 1988). Within the framework of oleotourism, the concept of authenticity is expressed in a variety of dimensions: object authenticity, which is related to tangible artefacts of the olive museums, centuries-old olive-trees and traditional milling apparatus; existential authenticity, which means the psychological conditions of connectedness with nature and rural lifestyle; and interactive authenticity, which pertains to the mimetic quality of interpersonal interaction with local producers and farming communities (Wang, 1999; Steiner and Reisinger, 2006). Authentic experiences that meet the perceptions of tourists will fulfil basic human needs of meaning, distinction and cultural belonging, thus producing positive appraisal of the experience (Cohen and Cohen, 2012).

Satisfaction is defined as the overall affective-cognitive attitude which comes as a result of experiential appraisal. It is conceptualized as tourists' holistic psychological condition arising from expectancy-disconfirmation processes, the comparison between pre-visit expectations and perceived experiential performance (Oliver, 2014; Pizam & Ellis, 1999). Genuine experiences often exceed predictive expectations, thus generating higher levels of satisfaction (Han and Hyun, 2015).

The ultimate strategic goal of destination stakeholders is tourist loyalty, which involves behavioral intent (e.g., revisitation propensity and positive word-of-mouth dissemination) and psychological commitment (e.g., emotional attachment and destination advocacy) (Zhang et al., 2014; Yoon and Uysal, 2005). In the context of specialized tourism, loyalty is often transferred to post-visit consumption patterns, including product purchases and long-lasting consumption of destination brands (Ahn and Back, 2018). A significant amount of empirical research records positive correlations between authenticity, satisfaction, and loyalty in a variety of tourism settings, such as cultural heritage sites (Rather, 2021; Chhabra et al., 2003), culinary tourism destinations (Bagheri et al., 2023; Stone et al., 2018), and rural tourism experiences (Kastenholz et al., 2012). Consequently, we hypothesize:

**H1:** Perceived authenticity has a positive influence on tourist satisfaction in the context of the olive-oil tourism.

**H2:** Perceived authenticity has a positive influence on the tourist loyalty in the framework of olive-oil tourism.

**H3:** Tourist satisfaction has a positive effect on tourist loyalty in in the context of olive-oil tourism.

**H4:** Tourist satisfaction mediates the relationship between perceived authenticity and tourist loyalty.

## **5. Moderation of AI-Based Personalization.**

The power of authenticity is that, as a source of experience, it can be enhanced or neutralized by technological mediation. The term AI -enabled personalization is used to refer to the use of machine-learning algorithms, predictive analytics, and adaptive systems to customize the experiences, services, and communications of individual tourists based on their preferences, behaviors, and contextual features (Ivanov and Webster, 2023; Xiang et al., 2015). In the framework of oleotourism applications, such personalization may include:

- Smart recommendation system target the particular olive farms that match the taste profile and travel history of the tourists.
- Chatbots based on artificial intelligence can provide real-time, very specific information on the peculiarities of the olive varieties and related agronomic practices in the area.
- Mill tours have augmented reality interfaces that overlay historical accounts and practices of cultivation (Neuhofer et al., 2014).

Using the Stimulus-Organism Response model, artificial-intelligence-based personalization is a contextual moderating variable that adjusts the strength of relationships between environmental stimuli (authenticity) and organismic responses (satisfaction and loyalty) (Eroglu et al., 2001). In the light of the Technology Acceptance Model, the stronger the perception of a technology as a means to enhance the fundamental experiential value, to the extent that it makes authentic experiences more available, informative, and convenient, the higher the adoption propensity and positive assessment (Davis, 1989; Lu et al., 2015).

Personalization through artificial intelligence has the potential to enhance the authenticity-satisfaction relationship by reducing the cognitive effort and friction involved in the acquisition and interpretation of authentic experiences (Buhalis and Law, 2008). An example, a

personalized itinerary algorithm ensures that the visitor is exposed to the most pertinent and interesting farm aspects, thus reaching the greatest perceived authenticity and subsequent satisfaction (Huang and Benyoucef, 2013). Equally, artificial intelligence can directly strengthen the relationship of satisfaction-loyalty by means of presentation of customized information and frictionless service provision; the balance effect of the smooth technological mediation and deep authentic interaction will create an interesting composite impression that will lead to the development of strong loyalty intentions (Huang and Rust, 2021; Buhalis and Sinarta, 2019).

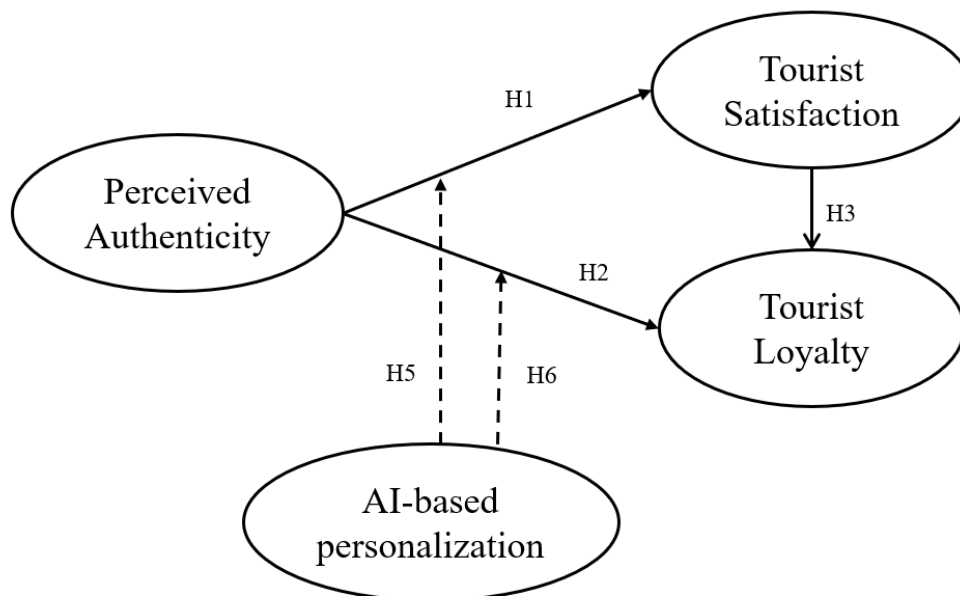
Although some researchers have expressed concern that technological interventions may de-authenticate some purist groups (Urry and Larsen, 2011), there is extant empirical evidence to suggest that technology in fact augmented experiential dimensions and did not diminish them in modern tourism settings when properly implemented (Tussyadiah, 2020; Neuhofer et al., 2021). Therefore, we posit:

**H5:** AI-based personalization has a positive moderating effect on the relationship between perceived authenticity and tourist satisfaction.

**H6:** AI-based personalization has a positive moderating effect on the relationship between tourist satisfaction and tourist loyalty.

Given the theoretical background and the proposed relationships discussed above, Figure 1 illustrates the combined conceptual model that informs this study. The model assumes both direct and mediated effects, where personalization through AI can be taken as a key boundary condition that determines the strength of the key theoretical relationships.

**Figure 1. Proposed model of the study**



## RESEARCH METHODOLOGY

### 1. Measure and questionnaire development

Each of the construct measures was based on previous studies in the area of tourism and technology acceptance. Perceived Authenticity was standardized as a second-order reflective construct with three dimensions, including object-based authenticity, existential authenticity, and interactive authenticity and measurement items were based on Kolar and Zabkar (2010) and Ramkissoon and Uysal (2011) and adjusted to reflect the oleotourism context. Tourist Satisfaction was assessed as a unidimensional measure with six items based on Oliver (2014), Chen and Chen (2010), and Prebensen et al. (2013). Tourist Loyalty was developed as a multidimensional construct including revisit intentions and recommendation intentions and was measured using seven items based on Zeithaml et al. (1996), Zhang et al. (2014), and Rather et al. (2022). The eight items based on Tussyadiah (2020), Ivanov and Webster (2023), and Huang and Rust (2021) were reviewed and modified to fit into the context of the oleotourism industry to evaluate AI-Enhanced Personalization. The responses were gathered with a seven-point Likert scale (1 to 7) where 1 was strongly disagree and 7 strongly agree.

### 2. Data collection

We used a quantitative research methodology in order to examine the hypothesized relationships among perceived authenticity, tourist satisfaction, tourist loyalty, and AI-enabled personalization within the Tunisian oleotourism. The current analysis was conducted in five main governorates of Tunisia that produce olive oil, namely, Sfax, Sousse, Mahdia, Kairouan and Monastir. All of these regions contribute about 65 percent of all olive-oil production in the country and have well-developed oleotourism facilities, including visitor-friendly olive farms, traditional oil mills, specialized museums, and structured tasting venues (Zouari et al., 2019). The fact that several geographical locations are included enhances the external validity and generalization of the results in the different contexts of oleotourism in Tunisia (Podsakoff et al., 2012). The data was collected during the four-month span of October to December 2024, which is the high season of oleotourism in the country. We used a survey with a questionnaire and we administered it to domestic and international tourists who had participated in at least one oleotourism activity. Olive tourism activities included guided tours of oil orchards, attendance in olive-oil tasting, observation of the mill work, and cultural events related to olives. The sampling strategy employed was purposive and non probability sampling whereby the targets purposely were tourists who met the inclusion criteria at olive-tourism sites, hotels located in olive-producing regions, and via partnership with tourism agencies. The analytical sample size was 450 respondents, whose demographic and travel-related characteristics were diverse enough to guarantee that the sample was representative of the Tunisian olive-tourism market. The demographic features are given in table 1.

**Table 1: Sample Demographic Characteristics (N = 450)**

| Characteristic | Category    | Frequency | Percentage |
|----------------|-------------|-----------|------------|
| <b>Gender</b>  | Male        | 198       | 44.0%      |
|                | Female      | 246       | 54.7%      |
| <b>Age</b>     | 18-25 years | 67        | 14.9%      |
|                | 26-35 years | 153       | 34.0%      |
|                | 36-45 years | 128       | 28.4%      |
|                | 46-55 years | 71        | 15.8%      |

|                                     |                          |     |       |
|-------------------------------------|--------------------------|-----|-------|
|                                     | 56 years and above       | 31  | 6.9%  |
| <b>Education Level</b>              | High school or below     | 82  | 18.2% |
|                                     | Bachelor's degree        | 245 | 54.4% |
|                                     | Master's/Doctoral degree | 123 | 27.3% |
| <b>Monthly Income</b>               | Below 1,500 TND          | 95  | 21.1% |
|                                     | 1,500-3,000 TND          | 178 | 39.6% |
|                                     | 3,001-5,000 TND          | 121 | 26.9% |
|                                     | Above 5,000 TND          | 56  | 12.4% |
| <b>Nationality</b>                  | Tunisian                 | 287 | 63.8% |
|                                     | International            | 163 | 36.2% |
| <b>Prior Oleotourism Experience</b> | First-time visitor       | 312 | 69.3% |
|                                     | Returning visitor        | 138 | 30.7% |
| <b>Travel Party Composition</b>     | Solo                     | 54  | 12.0% |
|                                     | Couple                   | 189 | 42.0% |
|                                     | Family                   | 143 | 31.8% |
|                                     | Group                    | 64  | 14.2% |

### 3. Results

The data analysis was carried out in a sequence of progressive steps, using complementary statistical methods to guarantee the strength and validity of the generated findings. We used exploratory and confirmatory factor analyses within the framework of structural equation modeling using SPSS 23 and AMOS 23 software. First, we carried out an exploratory factor analysis using principal component analyses on the pre-test sample (N=62) in order to purify the measurement scales. Then, a second data collection on the final sample of the 450 respondents took place to verify the relevance of the chosen solution.

#### 3.1 Results of Exploratory Factor Analysis

The Exploratory Factor Analysis (EFA) was conducted on a subsample of calibration (N 62) to examine the latent factor structure and support the dimensional coherence of the Tunisian oleotourism scenario. As a result, we obtained a good value of Bartlett's test of sphericity, an acceptable value of KMO ( $>0.7$ ) and a Cronbach's alpha greater than 0.6 (between 0.87 and 0.95), which demonstrates a good level of reliability (see Table 2 below).

**Table 2: Results of the exploratory factor analysis.**

| Dimension                                    | Items | KMO  | Variance explained | Cronbach's Alpha |
|----------------------------------------------|-------|------|--------------------|------------------|
| <b>Perceived Authenticity (Second-Order)</b> | 12    | 0.78 | 84.55              | 0.771            |
| <b>Object-Based Authenticity</b>             | 4     |      | 67.42              | 0.828            |
| <b>Existential Authenticity</b>              | 4     |      | 15.12              | 0.775            |
| <b>Interactive Authenticity</b>              | 4     |      | 78.32              | 0.881            |
| <b>Tourist Satisfaction</b>                  | 6     | 0.76 | 71.20              | 0.836            |
| <b>Tourist Loyalty</b>                       | 7     | 0.81 | 68.09              | 0.787            |
| <b>Intention to revisit</b>                  | 3     |      | 62.20              | 0.785            |
| <b>Intention to recommend</b>                | 4     |      | 64.80              | 0.771            |
| <b>AI-Enabled Personalization</b>            | 8     | 0.78 | 87.25              | 0.761            |

### 3.2 Results of Confirmatory Factor Analysis

The validation subsample (N= 450) underwent a Confirmatory Factor Analysis (CFA). The first measurement model, including four latent constructs, such as Perceived Authenticity as a second-order construct, Tourist Satisfaction, Tourist Loyalty, and AI-Enhanced personalization and 33 indicators observed, was estimated. The goodness-of-fit indices were all above the recommended values hence showing that the measurement model has a good fit. Together, these indices give strong evidence of the sufficiency of the model specification (Hair et al., 2019). Table 3 indicates the overall model fit indices.

**Table 3: Measurement Model Fit Indices**

| <b>X<sup>2</sup></b>         | <b>GFI</b> | <b>AGFI</b> | <b>RMR</b> | <b>RMSEA</b> | <b>TLI</b> | <b>NFI</b> | <b>CFI</b> | <b>CMIN/DF</b> |
|------------------------------|------------|-------------|------------|--------------|------------|------------|------------|----------------|
| 867.34<br>ddl=458<br>P=0.000 | 0.887      | 0.899       | 0.052      | 0.058        | 0.923      | 0.900      | 0.931      | 2.679          |

### 3.3 Reliability and Convergent Validity

The standardized factor loadings were between 0.76 and 0.91, far exceeding the minimum of 0.70 and thus validating that each indicator defined the intended latent construct (Hair et al., 2019). The alpha coefficients of Cronbach were between 0.878 and 0.937, all more than 0.70, hence excellent internal consistency (Nunnally and Bernstein, 1994). Composite Reliability (CR) scores were between 0.881 and 0.940 which exceeds the suggested 0.70 level and proves high internal consistency reliability (Fornell and Larcker, 1981). The range of AVE values of 0.649 to 0.709 were all above the critical value of 0.50 (Fornell and Larcker, 1981). Taken together, these findings are strong evidence of measurement model reliability and convergent validity. Table 4 involves a thorough evaluation of internal consistency reliability and convergent validity of all constructs.

**Table 4: Reliability and Convergent Validity Assessment**

| <b>Construct</b>                             | <b>Items</b> | <b>Factor Loadings Range</b> | <b>Cronbach's <math>\alpha</math></b> | <b>CR</b> | <b>AVE</b> |
|----------------------------------------------|--------------|------------------------------|---------------------------------------|-----------|------------|
| <b>Perceived Authenticity (Second-Order)</b> | 12           |                              | 0.934                                 | 0.937     | 0.651      |
| <b>Object-Based Authenticity</b>             | 4            | 0.78-0.87                    | 0.886                                 | 0.889     | 0.668      |
| <b>Existential Authenticity</b>              | 4            | 0.81-0.89                    | 0.904                                 | 0.907     | 0.709      |
| <b>Interactive Authenticity</b>              | 4            | 0.76-0.85                    | 0.878                                 | 0.881     | 0.649      |
| <b>Tourist Satisfaction</b>                  | 6            | 0.83-0.91                    | 0.927                                 | 0.930     | 0.691      |
| <b>Tourist Loyalty</b>                       | 7            |                              | 0.915                                 | 0.918     | 0.656      |
| <b>Intention to revisit</b>                  | 3            | 0.78-0.88                    | 0.871                                 | 0.910     | 0.642      |
| <b>Intention to recommend</b>                | 4            | 0.74-0.81                    | 0.825                                 | 0.899     | 0.621      |
| <b>AI-Enabled Personalization</b>            | 8            | 0.77-0.90                    | 0.937                                 | 0.940     | 0.694      |

### 3.4 Results of Structural Equation Analysis

We are analyzing the results obtained by the structural equations method on the Amos 23 software. We are analyzing the results obtained by the structural equations method on the Amos 20 software. Table 4 shows the goodness of fit measures are in the standards. The CMIN/DF, RMR, RMSEA, TLI, NFI and CFI are acceptable and underline a good fit. Also the values of GFI, AGFI are 0.879 and 0.839 respectively. They are considered a satisfactory quality of fit

since they are above 0.8 as suggested by Baumgartner and Homburg (1995), and Doll et al. (1994). Thus, the model adjusts to the data and presents a good quality of fit. We believe that the goodness of fit of the model is satisfactory enough to retain the model and to study structural links. The causal link between the two variables is considered significant if the "critical ratio" is  $CR > 1.96$  and  $P < 5\%$ . In our case, the different structural coefficients are quite significant ( $P < 5\%$ ) as well as ( $CR > 1.96$ ) and confirm all our research hypotheses. Results of the hypothesis testing are summarized in the table 5.

**H1** Perceived authenticity has a positive effect on tourist satisfaction. The hypothesis is highly supported by the results ( $\beta = 0.713$ ,  $t = 18.763$ ,  $p < 0.001$ ) whereby one standard deviation in perceived authenticity increased the tourist satisfaction by a standard deviation of 0.713, thus confirming the hypothesis that authenticity is a key factor of satisfaction in oleotourism settings.

**H2** predicted a direct positive effect of perceived authenticity on tourist loyalty. The hypothesis is supported ( $\beta = 0.184$ ,  $t = 3.538$ ,  $p < 0.001$ ), which means that authenticity has a both direct and indirect effect on loyalty.

**H3** hypothesized that tourist satisfaction positively affects tourist loyalty. Results also support the role of satisfaction as a strong proximal predictor of loyalty behaviors with a significant impact ( $\beta = 0.621$ ,  $t = 12.176$ ,  $p < 0.001$ ). Table 5 presents the results of direct effects hypotheses testing.

**Table 5: Direct Effects and Hypothesis Testing**

| H  | Path                  | Estimate | SE    | t-value | p-value   | Result    |
|----|-----------------------|----------|-------|---------|-----------|-----------|
| H1 | PA $\rightarrow$ SAT  | 0.713    | 0.038 | 18.763  | $< 0.001$ | Supported |
| H2 | PA $\rightarrow$ LOY  | 0.184    | 0.052 | 3.538   | $< 0.001$ | Supported |
| H3 | SAT $\rightarrow$ LOY | 0.621    | 0.051 | 12.176  | $< 0.001$ | Supported |

**H4** predicted that tourist satisfaction mediates the relationship between perceived authenticity and loyalty. Results support the existence of a statistically significant partial mediating effect. The indirect effect is significant and substantial ( $\beta = 0.443$ ,  $p < 0.001$ ), with the 95% confidence interval excluding zero. Since both direct effects ( $\beta = 0.184$ ,  $p < 0.001$ ) and indirect effects were statistically significant, the data confirms the existence of partial mediation, thus supporting hypothesis H4. These results suggest that, though perceived authenticity has a direct effect on loyalty, its main operational mechanism lies within the evocation of tourist satisfaction, which illustrates the importance of satisfaction as a key mediator in transforming authentic experiences into behavioral loyalty results. Table 6 presents the mediation analysis results examining the indirect effect of perceived authenticity on loyalty through satisfaction.

**Table 6: Mediation Analysis Results**

| Path                                   | Effect Type | $\beta$ | SE    | t-value | p-value   |
|----------------------------------------|-------------|---------|-------|---------|-----------|
| PA $\rightarrow$ SAT $\rightarrow$ LOY | Indirect    | 0.443   | 0.040 | 11.075  | $< 0.001$ |
| PA $\rightarrow$ LOY                   | Direct      | 0.184   | 0.052 | 3.538   | $< 0.001$ |
| PA $\rightarrow$ LOY                   | Total       | 0.627   | 0.041 | 15.293  | $< 0.001$ |

**H5** assumes that the relationship between perceived authenticity and tourist satisfaction is moderated by AI-based personalization. Results support this hypothesis. The path coefficient between authenticity and satisfaction is considerably greater in the high AIP ( $\beta = 0.781$ ) group than in the low one ( $\beta = 0.658$ ) and there is a significant difference between the two ( $\Delta\beta =$

0.123,  $p = 0.042$ ). This implies that, in case the tourists are subjected to high degrees of AI-enabled personalization, the positive impact of perceived authenticity on satisfaction is increased by roughly 18.7 percent in comparison to low personalization situations.

**H6** was that AI-driven personalization has a moderating impact on the relationship between tourist satisfaction and loyalty. This hypothesis is also supported. The strength of relationship between the satisfaction and loyalty is statistically significant at a greater value in the high AIP group ( $\beta = 0.693$ ) compared to the low AIP group  $\beta = 0.547$ ) as shown by significant difference in the path ( $\Delta\beta = 0.146$ ,  $p = 0.018$ ). This represents a 26.7% strengthening of the satisfaction-loyalty link when AI personalization is high, demonstrating that personalized technology enhances the conversion of satisfied tourists. Table 7 presents the results of a multi-group study that investigated the moderating effect of AI-based personalization.

**Table 7: Multi-Group Analysis Results for Moderation Effects**

| H  | Path                  | Low AIP Group<br>(n=223) | High AIP Group<br>(n=227) | Path<br>Difference |         |
|----|-----------------------|--------------------------|---------------------------|--------------------|---------|
|    |                       | $\beta$ (t-value)        | $\beta$ (t-value)         | $\Delta\beta$      | p-value |
| H5 | PA $\rightarrow$ SAT  | 0.658 (12.447)           | 0.781 (17.329)            | 0.123              | 0.042   |
| H6 | SAT $\rightarrow$ LOY | 0.547 (8.934)            | 0.693(13.841)             | 0.146              | 0.018   |

## DISCUSSION

The current study is an empirical confirmation of a multifaceted model that evaluates the mediation of AI-based personalization on the relationship among perceived authenticity, tourist satisfaction, and loyalty in Tunisian oleotourism. The findings provide theoretically and practically significant insights for technology-enhanced experiential tourism in culturally-embedded niches.

The strong positive effect of perceived authenticity on satisfaction offers a sound empirical evidence to Hypothesis 1 and is consistent with existing literature. This finding is consistent with the results of Kolar and Zabkar (2010) who have found that authenticity has a strong influence on satisfaction in the context of heritage tourism, and of Ramkissoon and Uysal (2011), who have found similar outcomes in the case of nature based tourism. Its magnitude ( $\beta = 0.713$ ) is in line with Bagheri et al. (2023) findings regarding gastronomic tourism and Stone et al. (2018) regarding culinary heritage, which supports the concept of authenticity as one of the key satisfaction determinants in the context of experiential tourism. The results related to the Tunisian oleo-tourism confirm that the motivations of the visitors are based on the search of authentic culturally based experiences, which include traditional farming practices, the integration into a local culture, and meaningful engagement with the producers. The multidimensional comprehensive construct of authenticity (object based, existential, interactive as Wang (1999) defines and Steiner and Reisinger (2006) elaborate) demonstrates that tourists evaluate authenticity in terms of material components, psychological states, and social interactions.

H2 is affirmed, and it reinforces the observations of Chhabra et al. (2003) and Rather (2021), who found similar trends in cultural heritage tourism. This result is in line with theoretical predictions based on the S-O-R paradigm (Mehrabian and Russell, 1974) in which the stimulus of the environment, that is, authenticity, influences the internal states like satisfaction, which, in turn, dominate the behavioral pattern, i.e., loyalty. The comparatively small magnitude of the direct effect indicates that authenticity induces its impact on loyalty via mediating processes, rather than through direct channels, a tendency also found by Kastenholz et al. (2012) in the rural tourism setting.

The great impact of satisfaction on loyalty is the solid support of H3 and is consistent with a broad range of previous studies. The given finding aligns with that of Chen and Chen (2010), Zhang et al. (2014), and Rather et al. (2022), who all found satisfaction to be a strong predictor of loyalty in various tourism contexts. The effect size ( $\beta = 0.621$ ) also supports the expectancy-disconfirmation theory of Oliver (2014), which suggests that positive experience evaluations produce affective responses that prompts the revisiting and recommendation actions. This finding confirms the role of satisfaction as the crucial psychological medium through which experiences are converted into behavioral commitment, in accordance with the findings of Yoon and Uysal (2005) and Zeithaml et al. (1996) studies.

Hypothesis H4 is backed by the significant partial mediation that satisfaction mediated 70.6% of the total effect of authenticity on loyalty (indirect effect = 0.443, direct effect = 0.184). This observation is entirely in agreement with Han and Hyun (2015) who reported the same mediation patterns in heritage tourism application and with Prebensen et al. (2013) in the context of experiential tourism. The dual-pathway model, where both direct and indirect effects are important, is congruent with recent dual-process models by Su et al. (2020), where the formation of loyalty is based on both automatic affective mechanisms and deliberative cognitive assessment via satisfaction.

It can be concluded that the hypothesis H5 is accepted, and AI-based personalization enhances the authenticity-satisfaction relationship by 18.7 per cent in high-personalization conditions.. This observation builds on the research by Neuhofer et al. (2021) and Buhalis and Sinarta (2019), who implied that technology, may add to the experiential value, and contradicts the fears of Urry and Larsen (2011) that technology is undermining authenticity. The positive moderation is consistent with Technology Acceptance Model (Davis, 1989; Venkatesh et al., 2003), which proves that when technology is perceived as relevant and as a contributor to core value, it enhances rather than reduces experiential outcomes. This confirms the theory of Tussyadiah (2020) that properly integrated AI is an experiential facilitator and not a detractor. The use of personalization through artificial-intelligence systems significantly enhances the correlation between customer satisfaction and loyalty, increasing it by 26.7%. This result is a continuation of the work by Ivanov and Webster (2023) and Huang and Rust (2021) who reported on the potential of AI to positively influence the results of the services, a new empirical confirmation in the framework of heritage-tourism. The fact that the moderation effect is intensified compared to H5 indicates that the effect of AI goes beyond the stage of evaluating an experience to the extent of creating behavioral commitment. The findings therefore support the empirical basis of the argument by Buhalis and Law (2008) that conversion to loyalty is created by technology which decreases friction in the service delivery.

This study contributes to the body of tourism research in various aspects both by building upon the theoretical knowledge base and by introducing new concepts in the intersection of experiential tourism, authenticity theory, and digital transformation. To begin with, the research confirms the relevance of the authenticity theory to the study of oleotourism, a poorly explored niche of agri-food tourism. The research has proved the strong effect of authenticity on satisfaction and loyalty by illustrating that authenticity theory works effectively when agricultural heritage, rural landscapes, and gastronomic culture intersect. The multidimensional second-order construct, which consists of object based, existential and interactive dimensions, presents a measurement framework applicable to other agri-food tourism settings.

Second, this research builds on the stimulus organism response (S-O-R) model by placing technology as a contextual modifier that determines the relationships between stimulus organism and organism responses. The classical uses of the S-O-R model predict the environmental stimuli as the precursors of psychological conditions that in turn lead to actions. The current study reveals that digital technologies are boundary conditions which enhance these central relationships, generating a conceptual interface between environmental psychology and

technology-acceptance views. Third, and most significantly, this study challenges existing discourse positioning technology and authenticity in inherent tension. The academic research on heritage tourism often assumes that digital mediation lowers the perceived authenticity of heritage experiences. Empirical evidence in this regard, however, demonstrates a synergistic relationship in such a way that appropriately incorporated artificial-intelligence personalization is not harmful to authenticity; on the contrary, it complements it. Accordingly, a theoretical reinterpretation is justified: authenticity is not necessarily incompatible with technology, the result will depend on the perception of the tourist and how the implementation is designed. The paradigm shift discussed changes the discourse on a technology-as-threat paradigm to a technology-as-enabler one.

Results offer practical implications to stakeholders who would wish to develop competitive, AI-enhanced oleotourism products. Since authenticity is an important factor in visitor satisfaction, operators must intensify all three dimensions: (1) object-based authenticity through the practice of traditional cultivation methods and historic equipment; (2) existential authenticity through direct participation experience that encourages cultural immersion; and (3) interactive authenticity through authentic producer-tourist encounters and personal narration. Some of the strategies that should be adopted by operators include pre-visit recommendation engines, which consider the interests of the visitors and offer them customized itineraries; on-site mobile apps, with adaptable audio-guides and augmented-reality overlays, to explain cultivation techniques, and post-visit personalized messages, including product suggestions and customized materials. Also, technology must be used to improve and not to distract. The design principles should put focus on unobtrusive interfaces and opt for interaction systems where preference towards analogue experience is not ignored and where artificial intelligence facilitates but does not substitute the actual human interaction.

For destination marketing organizations, Tunisian oleotourism must be promoted on the basis of genuine cultural immersion and cultural heritage sustenance, as opposed to generic positioning. Stories should be focused on the unique culture of the Tunisian olive and its centuries-old traditions. It will require a complete ecosystem that includes AI-controlled platforms that match the preferences of the visitors with the appropriate experiences, virtual tasting tools, the built-in booking systems, and the post-visit engagement platforms that can maintain the relationship through personalized content.

## CONCLUSION

The proposed research builds upon existing academic research on authenticity-based tourism by empirically investigating the added value of AI-based personalization to heritage-based experiences in the emerging oleotourism industry. We constructed and tested an integrated model based on the Stimulus Organism Response (S-O-R) framework and Technology Acceptance Model (TAM) to explain the relationships between perceived authenticity, satisfaction, loyalty, and AI personalization using data provided by 450 Tunisian oleo tourists. The findings show that perceived authenticity is a core antecedent of satisfaction and loyalty with satisfaction mediating the overall impact of authenticity on loyalty. Notably, AI-based personalization has a substantial amplifying impact on the authenticity-satisfaction relationship and the satisfaction-loyalty relationship, thus showing that properly developed technology has the potential to increase as opposed to destroying genuine experiences. These results have significant theoretical as well as managerial implications. Theoretically, the research extends the authenticity theory into the realms of the qualified agri-food tourism, delineates the conceptual frameworks of service and experiential notions, and introduces the findings on the synergies of technology and authenticity in the context of specialized tourism. In practice, the findings provide practical advice to oleotourism operators, destination

marketers, policymakers, and technology developers who aim to take profit of digital advances to facilitate sustainable growth of rural tourism and preserve cultural heritage.

The current paper explains how tourism that is becoming more and more attuned to the digital revolution can both respect tradition and be innovative. It shows that heritage tourism is not a linear path of an intrinsic trade-off between authenticity and technology; instead, it is defined by a conscious inclusion of both, therefore, delivering experiences that are enriched, personalized, and culturally authentic. When considering Tunisia and similar destinations, oleotourism is not just about economic diversification, but a means of preserving cultural identity and absorbing modernity, providing sustainable development schemes to rural populations facing the complexities of the 21<sup>st</sup> century tourism.

The study recognizes a number of limitations and hence provides constructive leads to future investigation. The external validity of the results is limited by the data collection that was designed in the specific cultural, economic, and technological context of Tunisia. Comparative research done over a geographical spectrum, including the Mediterranean oil-producing areas (Greece, Spain, Italy, Morocco), technologically developed economies (Japan, South Korea) and developing markets (Sub-Saharan Africa, Southeast Asia), would clarify the cultural and developmental boundary conditions that define the phenomenon. Whether the relationships between authenticity, satisfaction, loyalty and the moderating effects of artificial intelligence can work similarly in these different cultural contexts or whether individualist-collectivist orientations, power distance, and uncertainty avoidance play out as moderating factors is an empirical question.

The results of the study are solely based on oleotourism and thus cannot be generalized to other forms of agri-food tourism (wine tourism, cheese tourism, coffee tourism) or even to cultural heritage tourism in general. As much as theoretical reasoning can be used to imply that the same underlying mechanisms are supposed to be working in other authentic experiential settings, empirical validation of a range of tourism types is also crucial. The research also used a composite measure of AI personalization that had a wide range of technologies, such as recommendation systems, chat bots, augmented-reality interfaces, and adaptive content, thus hiding the potentially different effects that could be caused by individual technologies. Further studies would need to subdivide the different uses of AI, finding out whether recommendation algorithms, conversational agent, augmented-reality experience, or predictive analytics have different effects on the correlations between authenticity, satisfaction, and loyalty.

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