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► **To cite this version:**

Charlotte De Sainte Maresville, Christine Petr. FACIAL EXPRESSION AS EMOTIONAL DIAGNOSTIC (FEED): NEW OPPORTUNITIES FOR TOURISM AND HOSPITALITY (A LITERATURE REVIEW). E-journal of Tourism, 2024, 11 (1), 10.24922/eot.v11i1.114484 . hal-04750269

**HAL Id: hal-04750269**

**<https://hal.science/hal-04750269v1>**

Submitted on 23 Oct 2024

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# **FACIAL EXPRESSION AS EMOTIONAL DIAGNOSTIC (FEED) : NEW OPPORTUNITIES FOR TOURISM AND HOSPITALITY (A LITERATURE REVIEW)**

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## **ABSTRACT**

Facial expressions can be used to understand the emotional needs of tourist travelers. Interpreting facial expressions allows for customizing offers, enhancing emotional engagement, and obtaining customer evaluations. To guide stakeholders in the tourism industry in effectively integrating this technology, this article presents the potential of using facial expressions in tourism. The present approach (Facial Expression as Emotional Diagnostic : FEED) consists of 4 steps: 1) emotional diagnosis, 2) pre-experience customization, 3) emotional engagement during the experience, and 4) customer satisfaction measures.

By distinguishing between online and offline situations, we unfold these 4 steps of the FEED process. Further research will address associated technical and ethical challenges, including algorithmic biases and privacy concerns.

## **KEYWORDS**

Facial expressions ; Tourism ; Customer Experience ; Emotional Analysis ; Emotional Diagnosis

## **INTRODUCTION**

According to a survey conducted by Invibes Advertising in 2022, 80% of future vacationers are considering booking their stays online, while only 20% still opt for travel agencies. This trend is explained by the fact that we have more and more access to technology (Turkle, 2011). Indeed each stage of preparation is now accessible online, thanks to simplified interfaces suitable for both phones and computers. The common denominator remains interaction in front of the screen.

This reality opens up new perspectives for studying and observing facial expressions (González-Rodríguez et al., 2020) offering new fields of analysis to determine the moments and contexts where their use is relevant in tourism. Indeed, using facial expressions in tourism is an important new way to investigate the changing needs of travelers (Satoto et al., 2022). Instead of simply asking visitors how they feel, technical tools are used to accurately recognize facial expressions. What's more, facial expressions are even more sincere than tools such as forms or verbal exchanges (Zhang et al., 2020).

Considering this new opportunity, our research aims to explain the opportunities of using facial expressions in tourism. Therefore our article aims to assist tourism and hospitality companies in understanding how to effectively integrate this technology to make tourist experiences even more enjoyable.

In order to understand the potential of facial expressions and cameras today, after recalling the link between emotions and their importance in the tourism sector, we address how emotions can be identified through facial expressions. Then, we propose a research method that highlights new opportunities for management and research in the field of tourism and hospitality.

## **LITERATURE REVIEW**

### **1. The Importance of Emotions in the Tourist Experience**

#### 1.1. Influence of Emotions on Travel Motivation

Emotions play a crucial role at various levels in the travel planning phase. Firstly, they act as motivators, fueling aspirations and desires to explore new horizons (Volo, 2021). Emotions such as curiosity, excitement, and the need for escapism directly influence the decision to travel by arousing the desire to explore new places and experience unique adventures (Dijksterhuis et al., 2008). Additionally, emotions impact destination choice, with tourists drawn to places likely to evoke positive emotions such as joy, wonder, or tranquility. Finally, emotions play a crucial role in pre-trip information search. Tourists are more inclined to immerse themselves in trip planning when experiencing positive emotions such as enthusiasm or anticipation, leading them to actively seek information, reviews, and recommendations to enrich their upcoming experience (Walters et al., 2012).

### 1.2. Emotions During the Travel Phase

During the travel phase, tourists experience a wide range of emotions that enrich their overall experience. Even before departure, preparation elicits a mix of excitement for the adventures ahead (Ryu & Lee, 2016). Once on the road, each encounter, activity, and discovery triggers a variety of emotions, from joy to fascination to awe, and sometimes even anxiety in the face of the unexpected (Wang et al., 2021). These emotions are influenced by a multitude of factors such as cultural context, social interactions, weather conditions, past experiences, and personal elements like health and individual expectations (Phelps et al., 2014).

### 1.3. Emotions in the Post-Travel Phase

Post-travel emotions can vary considerably from one tourist to another, but they are often marked by a diverse range of feelings. Some may experience intense nostalgia for the moments lived and experiences shared, while others may feel relief upon returning to their daily routine (Hosany et al., 2021). Reintegrating into normal life can also be disruptive, with a possible "reverse culture shock" when differences between travel and daily life are challenging to assimilate (Wang, 2023). Furthermore, emotions felt during and after travel can strongly influence destination loyalty (Prayag et al., 2017). Emotionally positive experiences can strengthen tourists' attachment to the destination and promote willingness to return in the future, while negative emotions such as disappointment or frustration can decrease the likelihood of return and negatively impact the perception of the destination (Wang et al., 2012). Finally, emotions play a crucial role in word-of-mouth and recommendations (Yu et al., 2001).

## **2. The potential of facial expressions to identify tourists' emotions**

### 2.1. Facial expressions for emotion detection

Understanding emotions relies on various theories. Paul Ekman's basic emotions theory identifies a universal set of facial expressions associated with primary emotions (Ekman, 1992). The close link between emotions and facial expressions is confirmed by the correlation between internal emotional states and configurations of facial muscles (Hassin & Trope, 2000). Facial expressions act as visual indicators of emotions, emphasizing the importance of micro-expressions (Jack & Schyns, 2015). The underlying neurological mechanisms involve various brain regions and neural pathways, enabling a better understanding of the nature and manifestation of emotions as well as their connection to facial expressions (Achaibou, 2008).

### 2.2. Methods for identifying emotions via facial expressions

Traditional facial expression analysis techniques rely on observation and manual interpretation by experts, often with the use of specific evaluation grids (Plutchik, 1980). Although they have been widely used in psychological research, they are prone to biases and interpretation errors (Ciston et al., 2022). In contrast, new technologies such as automated facial recognition and artificial intelligence offer objective and accurate analysis of facial expressions, with significant advantages in terms of speed and objectivity (De Wijk & Noldus, 2021). However, their use raises ethical concerns regarding the privacy of personal data and requires strict regulations to ensure responsible use (Buell et al., 2015).

### 2.3 Emotions to enhance the tourist experience

Facial expressions are essential tools for enhancing the tourist experience (De Sainte Maresville & Petr, 2023). They allow service providers to understand and respond to visitors' emotional needs, notably through automated facial recognition that detects expressions of satisfaction or dissatisfaction (Gupta et al., 2023). Moreover, these expressions provide valuable data for destination management by assessing the impact of attractions and policies on tourists' emotions, thus facilitating tourism planning and development (Luigi et al., 2019). Finally, they play a key role in the development of marketing and communication strategies, enabling companies to adapt to tourists' emotions and optimize the effectiveness of their advertising and communication campaigns (Mitas et al., 2022).

## 3. RESEARCH METHOD

The selection of methodological references to construct a research model applicable to tourism and hospitality was carried out based on the top 9 HCERES-ranked marketing journals between January 2019 and December 2023. HCERES incorporates a variety of criteria to assess the quality of journals, including their academic impact and relevance in the specific field of marketing, making it an appropriate choice for this study.

A five-year timeframe was chosen to provide a current perspective on recent advances in marketing, grounded in the growing impact of new technologies on the use of facial expressions and emotions (Odaptos, 2020).

To analyze the dataset, we followed the PRISMA model to identify trends, emerging themes, and notable developments. The article selection process occurred in multiple stages (filters : date, keywords, ranked articles). Initially, a broader set of articles published in these nine journals within the defined period was identified. At the conclusion of this process, a final corpus of sixty-five articles was chosen for analysis (74% with full access and 26% with restricted access in terms of abstract and reference), representing a targeted and relevant sample of the scientific output during the period.

## 4. RESULTS

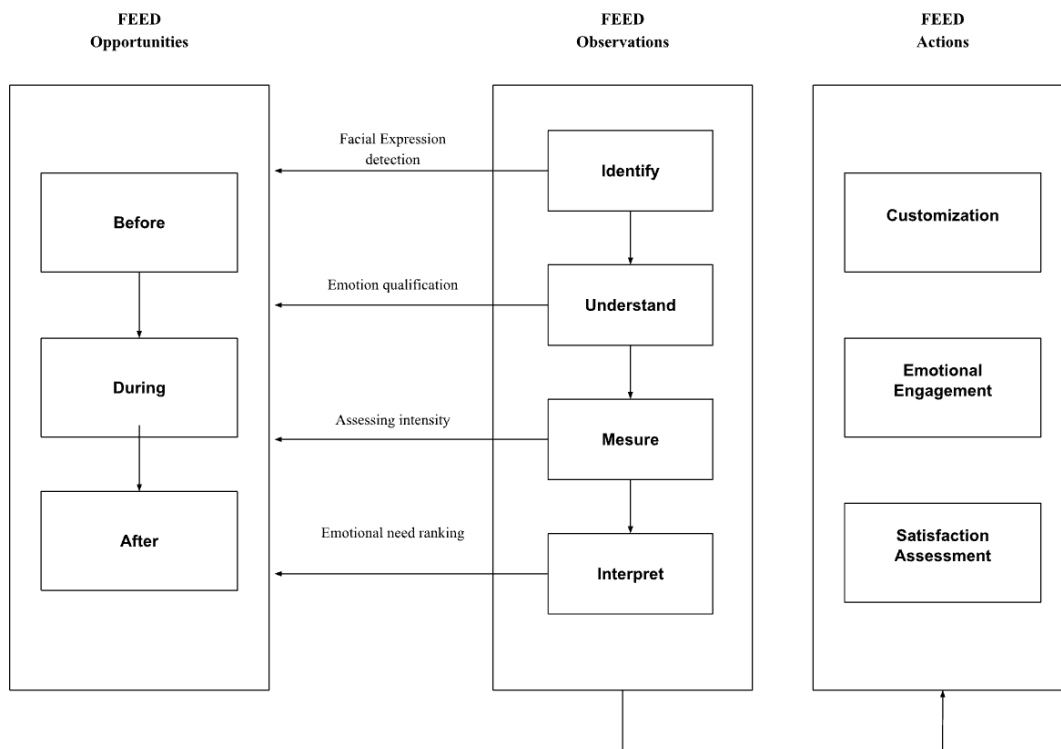
## The FEED Method as a Research Agenda

The research agenda proposes a structured approach in four steps to harness the possibilities of exploring the use of facial expressions in the tourism and hospitality sector. Firstly, emotional diagnosis through facial expressions aims to understand, assess, and measure individuals' emotional states to better target customer needs and preferences.

Secondly, using facial expressions for pre-experience personalization explores how these reactive expressions can be leveraged to tailor offerings and services based on individual preferences, thus enhancing customer satisfaction and engagement.

Subsequently, emotional engagement during the experience seeks to investigate how to integrate facial expressions to stimulate customers' emotional engagement during their tourist experience, thereby promoting their emotional well-being and satisfaction.

Finally, using facial expressions as a customer measure tool examines how these expressions can be used non-intrusively to gather information about customers' experiences, enabling businesses to better understand their needs and opinions and improve their services accordingly. This holistic approach provides a comprehensive framework for exploring the opportunities presented by the use of facial expressions in the tourism and hospitality field, opening up new avenues for research and innovation.



**Figure 1. Facial Expression As Emotional Diagnostic (FEED) Model**

## 5. DISCUSSION

### 5.1. Theoretical implications

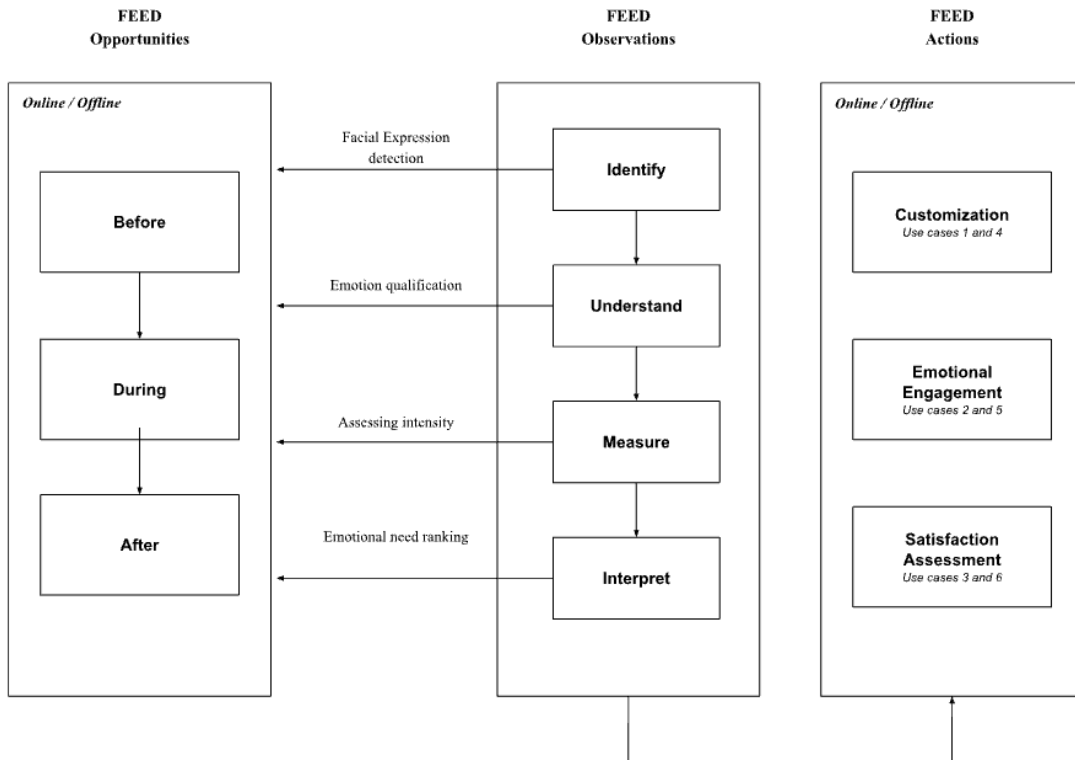
First, this study expands and deepens the theory of emotions in tourism, once again highlighting the significance of emotions at various stages of the journey (Volo, 2021). This study aligns with other theoretical frameworks that demonstrate the importance of tourist emotions from the planning phase through to post-travel experiences (Luigi et al., 2019). It builds upon prior research that has shown the impact of emotions on travel motivations (Volo, 2021), destination choices (Aziz et al., 2018; Kwortnik & Ross, 2007), and overall traveler satisfaction (Barger & Grandey, 2006; Prayag et al., 2017; Yu & Dean, 2001).

Moreover, the study contributes to the theory of personalizing tourist experiences by proposing the use of facial expressions to tailor offers and services based on customers' emotions (Phelps et al., 2014). By enriching the discussion on how digital technologies can be leveraged to personalize tourist experiences and by providing a framework for utilizing facial expressions, it builds on Gupta's study (2023), which demonstrates how facial expressions can personalize, secure, and streamline travel services.

Lastly, the study also aligns with efforts to address the shortcomings of current satisfaction, intention, or customization measurement tools that primarily rely on verbal data (Zhang et al., 2020). It draws from work such as the development of a Destination Emotion Scale (DES), which is a reliable and valid scale for measuring tourist emotions across different cultures and destinations (Hosany et al., 2015). It confirms the usability of facial expressions as a measurable indicator of traveler emotions, thereby offering new insights into understanding and interpreting tourist motivations and behaviors.

### 5.2. Managerial implications

This study highlights multiple managerial implications that are pertinent across different stages of the customer journey (Fig. 2). These implications offer valuable insights applicable in both online (as depicted in Table 1) and offline (as shown in Table 2) scenarios. The findings suggest actionable strategies and recommendations that can enhance customer engagement, optimize operational efficiencies, and improve overall customer satisfaction. By examining these implications within the context of online and offline environments, organizations can tailor their approaches to effectively address diverse customer needs and preferences throughout their journey.



**Figure 2. Application of the FEED Method with use cases**

**Table 1**

The possibility of FEED Method for online situations

Use cases for online situations	
1	<p>While browsing a hotel booking website, facial recognition within the customer's device assesses their emotional responses to various accommodation options, allowing the site to recommend hotels aligned with their emotional state, such as suggesting relaxing accommodations for those exhibiting signs of stress.</p> <p>The website utilizes facial recognition to assess customers' emotional responses to travel options, tailoring personalized activity suggestions that align with their enthusiasm and interests, ranging from museum visits to outdoor excursions.</p>
2	<p>The platform employs facial recognition during virtual tourist destination tours to gauge emotional engagement, offering supplementary information or interactive content to enhance the experience if the customer displays fascination with specific aspects of the tour.</p>
3	<p>Following the virtual tour's conclusion, the platform prompts customers to share their evaluation by capturing a brief video of their facial reactions, offering valuable insights into the most memorable or least satisfying aspects of their visit, thereby enhancing the authenticity and depth of customer investigation.</p>



**Table 2****The possibilities of FEED Method for offline situations**

<b>Use cases for offline situations</b>	
4	<p>In hotels, facial recognition cameras at check-in analyze guests' expressions to assess satisfaction and excitement levels, aiding staff in anticipating needs and customizing experiences; for instance, offering free upgrades or spa services to relax tired or stressed guests.</p> <p>Prior to booking a trip, a travel platform employs facial recognition to evaluate visitors' emotional responses while perusing various travel options, leveraging these expressions to suggest destinations and activities aligning with their interests and preferences; for instance, recommending seaside destinations to customers exhibiting enthusiasm when viewing beach images.</p>
5	<p>Throughout a guided tour, the tour guide utilizes facial expressions to assess participants' emotional engagement, adapting their narration accordingly; for instance, if they perceive boredom or disinterest among participants, they may pivot topics or integrate more captivating anecdotes to sustain attention and engagement throughout the tour.</p>
6	<p>Following a tourist experience, a theme park implements camera-equipped feedback kiosks to instantly gather visitors' facial reactions, offering insights into their satisfaction levels and identifying the most and least memorable aspects of their visit; for instance, expressions of surprise and delight at a new attraction may indicate its success, prompting the park to consider further investments in similar attractions.</p>

**CONCLUSION**

Our research highlights the vast potential of using facial expressions in the dynamic sector of tourism and hospitality. By describing and illustrating the comprehensive FEED approach, we show how this method can be used at different stages of the customer interaction. In fact, Facial Expression as Emotional Diagnostic (FEED) allows to personalize experiences, enhance emotional engagement, and gather valuable customer measure.

A promising aspect of this facial expression approach is its potential scalability, due to the increasing proliferation of cameras in various contexts such as interactive kiosks, computers, and smartphones.

However, it is essential to acknowledge the technical limitations associated with facial recognition, such as algorithmic biases and limitations related to the accuracy and reliability of emotional analyses, which may require further studies. By carefully navigating these challenges, the FEED method provides precise insights for tourism and hospitality experiences.

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