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Memorable tourism experience in the context of astrotourism

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Abstract

Astrotourism is a niche tourism that has been emerging in the last years. This type of tourism evolves a diversity of activities developed at night, being necessary a deeper knowledge about the cognitive process and emotions tourists have during an experience of this nature which lead to a memorable experience and loyalty. Based on the insights from 304 questionnaires applied at an astrotourism event, it is explored how (i) astrotourism stimuli are associated to cognitive states designed by knowledge and involvement, (ii) cognitive states enhance emotional states of hedonism and refreshment, and (iii) emotional states generate response as recommendation and loyalty. This study contributes to extend the S-O-R framework by integrating the cognitive appraisal theory and incorporate stimuli and above all cognitive and emotional states not employed in prior research, usually devoted to dominance, pleasure and arousal. Recommendations for astrotourism destination managers are also discussed.

Keywords: Memorable Tourism Experience, Astrotourism experience, S-O-R approach, cognitive appraisal, loyalty

Introduction

Astrotourism evolves in low density territories, with low levels of light pollution and not massified in terms of tourism. Astrotourism can be defined as “... tourism using the natural resource of unpolluted night skies, and appropriate scientific knowledge for astronomical, cultural and environmental activities” (Fayos-Solà et al., 2009, p. 5). This special interest tourism is considered a form of sustainable tourism since it implies a mitigation of light pollution to be developed. Although, astrotourism activities can be developed during day (sun observations) most of the activities are experience at night such as stargazing with or without high-tech equipment, astrophotography, arqueoastronomy amongst others (Rodrigues, 2020). The perception of the space-time continuum of the day is different from the night. Darkness seems to have its own personality (Galinier et al, 2010), creating perceptions that can merely occur when light fades away, as if darkness becomes an entity with the capacity to reconfigure and challenge the ways familiar spaces are perceived (Edensor, 2015). This double perception of the same reality, a reality that unfolds in various sceneries, is quite enriching for tourist destinations, since the same destination can provide different sceneries and function as a double target, the sight of a destination during daytime versus nighttime can be seen as two distinctive tourism experiences. The dark landscape is surrounded by imaginaries based in legends and stories, media representations and memories (Cook & Edensor, 2017). Therefore, an experience of astrotourism is expected to be memorable, unique in its kind and meaningful.

In academia there are many studies about memorable tourism experience on a day light environment, but there no studies evolving night environments such as astrotourism experiences. A memorable tourism experience (MTE) as proposed by Kim, Ritchie, and McCormick (2012) is multidimensional.

Different scholars attempt to analyze MTE in different context and considering all of them aggregated as a whole, such as marine tourism (Jonas, Radder, & Van Eyk, 2020), festival (Soehadi, & Ardianto, 2019) or international tourism (Zhang, Wu, & Buhalis, 2018). Yet, each of them as a specific meaning. Some are more emotional (e.g., hedonism or refreshment), others more cognitive (e.g., knowledge or involvement) or even can represent the stimuli lived in an event (e.g., novelty or meaningful). Thus, how the MTE dimensions are related among them? Although important to understand the mechanism that led tourists to recommend or become loyal to an event at a destination (e.g., astrotourism), the answer for such question is still missed.

Based on the cognitive appraisal theory, the stimuli received through an experience (such as astrotourism) will generate a cognitive and emotional evaluation in the tourist' mind. The interiorization of the stimuli can trigger a positive or negative response by the tourist. Thus, combining the cognitive appraisal theory with the S(stimuli)-O(organism)-R(response) framework, one can argue that the stimuli received in an astrotourism event will develop cognitive and emotional states in the tourist' mind and those states will lead to a response, as the recommend to others and the loyalty to the astrotourism. With this assumption in mind, the current study aims to explore how (i) astrotourism stimuli are associated to cognitive states designed by knowledge and involvement, (ii) cognitive states enhance emotional states of hedonism and refreshment, and (ii) emotional states generate response as recommendation and loyalty.

This study will contribute to extend the S-O-R framework by integrating the cognitive appraisal theory and incorporate stimuli and above all cognitive and emotional states not employed in prior research, usually devoted to dominance, pleasure and arousal (e.g. Eroglu Machleit & Davis, 2001, 2003; Kawaf & Tagg, 2012; Loureiro, 2015). Managers of astrotourism can also benefit with a deeper knowledge about the cognitive

process and emotions they have during an event of this nature which lead to a memorable experience and loyalty.

Proposed Model and Hypotheses Development

Cognitive appraisal theory and S-O-R Framework

Cognitive appraisal theory (CAT) has been widely applied as a comprehensive framework to study the causes and influences of emotions on consumer or tourist behavior (Bastiaansen et al, 2019; Hosany, 2012, Prayag, Hosany & Odeh, 2013; Hosany, Martin, Woodside, 2020; Manthiou, Kang & Hyun, 2017; Skavronskaya et al, 2017; Zheng, Ritchie, Benckendorff, & Bao, 2019; Zheng, Ritchie, & Benckendorff, 2020). S-O-R framework explains that the stimuli of an experience can be interiorized by and organism, as cognitive and emotional states, which in turn, lead to a response (e.g., Jiang, 2020; Kim, Lee & Jung, 2018; Loureiro, 2015; Loureiro, Stylos & Bellou, 2021).

The cognitive appraisal approach of emotions is widely accepted as a theoretical standpoint for understanding emotional reactions induced during the consumption context (Johnson & Stewart, 2005). An appraisal can be defined as a “cognitive process (and) the way an individual defines and evaluates relationships with the environment” (Lazarus, 1991, p. 3). CAT of emotions has become the dominant approach used to study consumer emotions because of its explanatory power (Jiang, 2019; Johnson & Stewart, 2005). According to Bagozzi, Gopinath and Nyer (1999) CAT can explain why individuals’ various emotions would be elicited to the same or similar event, and it provides a more extensive analysis of how specific emotions are evoked and impacted on human behaviors. In other words, CAT helps to apprehend the subtle traces of emotions by processing different cognitive appraisals as consequence of an appraisal stimuli in relation to a person’s goals, motives, wants and needs. (Zheng, Ritchie, Benckendorff &

Bao, 2019). Emotions are elicited and differentiated on the basis of the subjective evaluation of a stimulus or event on a set of standard criteria or objectives such as novelty, intrinsic pleasantness, goal conduciveness, and normative significance, as well as the coping potential of the organism (Brosch, Pourtois & Sandur, 2010). What ultimately generates emotion is not the objective facts of a situation, but instead their appraisal which arises from the cognitive processing of environmental and subjectively experienced data. Lazarus (1991) define the concepts of primary appraisal which is related with the evaluation of a stimulus as significant to the individual, secondary appraisal is related with the resources an individual as disposable to face the situation and reappraisal that can lead to changes of the primary and/ or secondary appraisal.

Following the S-O-R framework, the stimuli of an astrotourism event -such as that in Dark Sky® Alqueva- will generate cognitive and emotional states of the tourists who lived such experience (organism) (Eroglu et al., 2001, 2003; Loureiro, Stylos & Bellou, 2021). Appraisal theory claims that in the individuals' mind, cognitive changes generate emotional states (Zheng, Ritchie, Benckendorff, & Bao, 2019; Zheng, Ritchie, & Benckendorff, 2020). Therefore, the proposed model (see figure 1) suggests that cognitive states – knowledge and involvement– are associated to emotional states, as hedonism and refreshment. The response (R) of tourists is achieved after they interiorize the stimuli cognitively and emotionally.

Novelty, local culture and meaningfulness as Stimuli

Stimuli develop individuals' cognitive and emotional states (organism) which in turn determine behavioral responses of approach or avoidance (Rajuguru, 2014). In this study, Novelty, local Culture and Meaningfulness are considered stimuli.

Novelty can be defined as the quality of not being previously experienced or encountered, being the extent to which stimulus is different or familiar for the individual compared to the typical information that the person possesses (Barto, Mirolli & Baldassarre, 2013, Skavronskaya, Moyle, Sthapit, 2017; Scott & Kralj, 2019). Emotion psychologists such as Fredrickson (1998) describe novelty as a specific, innate trigger for the positive emotion of interest, and it is possible that this specific emotion drives the positive emotion peaks that occur during tourism experiences (Mitas & Bastiaansen, 2018). Novelty in the appraisal theory evaluates the unexpectedness of an experience (Ma et al (2013).

Kim et al. (2010) in a study developed to test a model to investigate the effects of memorable tourism experiences on future behavioral intentions reported empirical evidence of the contribution of local culture (analyzed through social interaction) to a memorable experience, wherein respondents who experienced local culture during their travel experiences had high levels of recollection of their past experiences that enhanced their existing knowledge.

Meaningfulness refers to a sense of great value or significance or broadening one's thinking about life and society (Courdonaris & Sthapit, 2017). According to Kirillova, Cai and Letho (2017) the human–environment interaction during travel has a unique role in tourism experience. Thus, natural environments are perceived as more restorative and are better able to evoke the sense of fascination and awe, which has been associated with meaningfulness.

Knowledge, Involvement, Hedonism and refreshment as Organism

Organism refers to the internal and the intervening process which consists of perceptual, physiological, feeling, and thinking activities (Kumar & Kim, 2014), such as acquiring new knowledge, involvement hedonism and refreshment. Knowledge can be defined as the cognitive aspect of a tourist's experience and involves learning and education (Morgan & Xu, 2009). For Boswijk, Thijssen, and Peelen (2007) the experience of learning in tourism could lead to meaningful experiences, consumers do not want to buy products, but rather stories and the experience behind the product (Jensen, 1999). To learn new knowledge is one common motivation to travel (Dias & Dias, 2014; Hsu, Lee & Chen, 2016). By other side, Tung and Ritchie (2011) find that intellectual development and gain new knowledge was one of the most significant components of memorable experiences.

Involvement is defined as the extent to which tourists are interested in an activity and the extent to which their affective responses are aroused by the activity (Manfredo, 1989). Involvement is evoked by a particular stimulus or situation and has driven properties. Within consumer theory involvement reflects the extent to which a person associates him or herself with an activity or product (Trauer, 2006), indicating the degree to which an individual is devoted to an activity, product, or experience. According to Hightower, Brandy and Baker (2002) involvement leads to positive emotions which strengthens the importance of consumer involvement on the hedonic experience. As the cognitive appraisal theory proposes a perception of a particular experience is followed by an evaluation (appraisal) based on appraisal dimensions, from which a particular emotion is elicited with the potential to influence a person to have a certain behavior (action) (Skavroskaya, Moyle & Scott, 2020). Cai, Lu and Gorsoy (2018) claim that in the primary evaluation the appraisal begins with a comparison between the environmental stimuli (astrotourism) and the predicted goal of an individual. The primary appraisal presents to the individual signals that situation has potential to elicit cognitive and emotional

responses. In this study knowledge and involvement are considered cognitive appraisals since primary appraisal involves the assessment of motivational relevance (is what is happening relevant to my goals?) and motivational congruence (if yes, does it foster or hinder the achievement of my goals?) (Mansted & Fischer, 2001). The answer to these questions could be achieved through the awareness and familiarity gained by the experience (Knowledge) and by the involvement of the individual in the experience.

Therefore, we propose the following hypotheses (see Figure 1):

H1: Novelty is positively associated with knowledge

H2: Novelty is positively associated with involvement

H3: Local culture is positively associated with involvement

H4: Meaningfulness is positively associated with knowledge

H5: Meaningfulness is positively associated with involvement

H6: Meaningfulness is positively associated with knowledge

INSERT FIGURE 1 ABOUT HERE

According Fennel (2006) hedonism can be seen has the goal that renders participation in an activity worthwhile allowing the tourist to determine what is pleasurable. Hedonism is the aspect of consumption experience that relates to the multi-sensory, imaginative and emotive elements perceived by consumers (Hirscham & Holbrook, 1982). The concept of hedonism is closely related to emotions and pertains to the affective state and sensory experience of pleasure (Grappi & Montanari, 2011). In the pursuit of pleasurable experiences, people tend to seek moments with the absence of negative stimuli (Borges, Mondini, Domingues & Lavarda, 2016), beyond pleasure, the fun is also part of the hedonism understanding (Holbrook & Hirschman, 1982). For O' Shaughnessy and O' Shaughnessy (2007) every person is somewhat

hedonistic simply because everyone, in some form, prefers to experience a pleasurable life. Hedonic feelings in pleasurable shopping experiences increase the perception of the service value and the propensity to spend more on the acquisition (Clubs & Chaudhuri, 2012; Saayman & Merwe, 2014). Zeithaml (1988) adds that higher perceived value held by consumers results in higher likelihood for favorable behavior intentions and Butz and Goodstein (1996) find that hedonic value is important for to achieve loyalty amongst the consumer. Individuals highly value refreshment as a psychological benefit from their travel experiences (Coudouranis & Statpit, 2017). Kim, Ritchie, and McCormick (2012) identified refreshment as being a feeling that enhanced the memorability of tourism experiences. Past studies as those from Maeng, Jang & Li (2016) and Yoo, Lee & Lee (2015) find that refreshment and getting away from daily routine is one of the major motivations for tourists attend special events and festivals. Goossens (2000) shows that exists a link between motivations and emotions. According to Salomon (2007), hedonic motivation refers to experiential and emotional incentives for consumers to engage in shopping-related activities. In this study hedonism and refreshment are considered second appraisals. Secondary appraisal involves an assessment of whether resources (internal and external) can be used to cope with a situation. Thus, we suggest the following hypotheses:

H7: Knowledge is positively associated with hedonism

H8: Knowledge is positively associated with refreshment

H9: Involvement is positively associated with hedonism

H10: Involvement is positively associated with refreshment

Behavioral intentions as Response

Within service marketing and tourism literature, behavioral reactions have been mostly accepted in measuring consumers' response. The behavioral perspective measures consumers' response in terms of loyalty (Courdounaris & Sthapit, 2017), and behavioral intention (Chang, 2016). In the tourism context, behavioral intentions are analyzed through two factors, namely, revisit intentions (loyalty) and willingness to recommend the experience to others. Revisit intentions can be defined as the tourist's intentions to have the same experience in the near future (Park, Bufquin & back, 2019; Shoemaker & Lewis, 1999) and the tourists' willingness to recommend the experience to others is linked to positive word of mouth (Bubacar & Mavondo, 2014; Coudouranis & Sthapit, 2017; Taheri, Chalmers, Wilson & Arshed, 2021). Behavioral intentions can be increased as a result of positive emotions (Lee et al., 2009; Prayag, Hosany, Muscat & Del Chiappa, 2015; Pestana, Parreira & Moutinho, 2019; Serra-Cantallops, Ramon-Cardona & Salvi, 2018). Emotions can be defined as an affective state of a person arising from appraisals of self-relevant interactions with the environment, emotion is deemed essential in understanding human-environment interaction, tourism, festivals and events are full refreshing and hedonic moments as consequence of multisensory-based interactions between human and environment, being undoubtedly emotional laden (Zhang, Shen & Hsu, 2021). Therefore, the following hypotheses are suggested:

H11: Hedonism is positively associated with loyalty

H12: Hedonism is positively associated with recommendation

H13: Refreshment is positively associated with loyalty

H14: Refreshment is positively associated with recommendation

Method

Measures

Memorable Tourism Experiences was measured with 16 items. The proposed scale is the scale to measure memorable tourism experiences developed by Kim, Ritchie and McCormick (2012) and that has been previously validated by several studies (Coudouranis & Statpit, 2017; Jonas, Radder, & Van Eyk, 2020; Soehadi & Ardianto, 2019; Statpit & Courdouranis, 2018; Wei et al, 2019). Respondents were asked to provide their opinions on a 7-point Likert scale, ranging from '1 = strongly disagree' to '7 = strongly agree' (Azzara, 2010).

Intention of loyalty and recommendation: loyalty was measured with 3 items that measure revisit intentions and recommendation was also measured with 3 items based on Chi and Qu (2008), Su, Cheng and Huang (2011) and Sun, Chi and Xu (2013). Similar to MTE scale, respondents were asked to provide their opinions on a 7-point Likert scale, ranging from "1 = strongly disagree" to "7 = strongly agree".

Sampling Procedure and data collection

The field research study was undertaken during the astrotourism event Dark Sky Party Alqueva 2019 at 27 and 28 of July, where the main motivation of the participants is to experience astrotourism activities, such as day and night sky observations, astrophotography, night kayaking, wine tasting experiences at night amongst others. The event had a single entrance and for participants to enter on the event area they had to

travel by bus provided by the event's organizer. In this way, it was possible to account for the entry of 1852 people. Participants were interviewed after having enjoyed at least one night sky observation of celestial phenomena. The questionnaire was administered by 5 field researchers first the field researchers outlined the research purpose and invited them to participate in the survey. Following their consent, a self-administered questionnaire was provided to those who preferred to complete it themselves, or the field researchers helped them complete the questionnaire. Of the 620 questionnaires distributed, by the five field researchers only 304 questionnaires were completely filled out and used in this study giving a response rate of 65%.

INSERT TABLE 1 ABOUT HERE

The sample is composed by 53, 9% of female and 43,6% of male; 46,8% were between the ages of 15 and 35; the majority of the respondents went to the event with friends 41,3% and in couple 24,7% and had a full-time job 70,3% or were students 19,3%.

Results

The partial least squares (PLS) approach was employed to test the hypotheses. PLS is based on an iterative combination of principal component analysis and regression to explain the variance of the constructs in the model. PLS makes lower demands on sample size, residual distributions, measurement scales, avoids inadmissible solutions and factor indeterminacy, and minimizes the variance of the dependent variables (Chin, 1998; Fornell & Bookstein, 1982).

In using PLS the adequacy of the measures should be analyzed first. Thus, the reliability of the individual measures (see table 1) are all above 0.7 and all Cronbach's alpha and composite reliability values are equal or above 0.7 and so the constructs are

reliable. The values of AVE above 0.5 reveal convergence validity (Wetzels, Odekerken-Schröder, & van Oppen, 2009) (see table 2).

INSERT TABLE 2 ABOUT HERE

Concerning discriminant validity, two criteria were used: Fornell-Larcker and Heterotrait-Monotrait Ratio (HTMT). For the first the square root of AVE of construct is greater than the correlation between that construct and other constructs in the model (see table 3). The second demonstrated that the HTMT value is below 0.90, discriminant validity has been established between two constructs (see table 4).

INSERT TABLE 3 ABOUT HERE

INSERT TABLE 4 ABOUT HERE

Hypotheses were analyzed using a non-parametric approach, known as Bootstrap (500 re-sampling). All path coefficients are significant at the 0.001, except the relationship Novelty -> involvement, which is supported at a significant level of 0.10 ($\beta=0.177$, $p=0.054$). Finally, two relationships are not supported: Local culture -> Involvement and Local culture -> Knowledge (see table 5).

INSERT TABLE 5 ABOUT HERE

We also analyze the predictive validity (such as R^2 and Q^2). The values of Q^2 (squared of the Stone–Geisser criterion) are positive indicating the relations in the

model have predictive relevance (Fornell & Cha, 1994). The model has also a good level of predictive power (R^2) because the modelled constructs explained 61.1% of the variance in knowledge, 52.8% of the variance in involvement, 50.2% of the variance in hedonism, 41.7% of the variance in refreshment, 35.0% of the variance in loyalty and 30.1% of the variance in recommendation. The value of SRMR is below 0.08, revealing a good fit (Hair et al., 2017).

When analyzing the mediating effects, we find twenty-two partial mediations (see Appendix A) according to Hair et al. (2017) because the value of total path is larger than the value of total path. Therefore, involvement exercise a partial mediation effect between meaningfulness and hedonism or refreshment. Knowledge partially mediates between meaningfulness or novelty and hedonism or between meaningfulness or novelty and refreshment. Hedonism partially mediates between knowledge or involvement and loyalty or recommendation. Refreshment partially mediates between knowledge and loyalty or recommendation and between involvement and recommendation (see table 5).

When considering the double mediations, involvement and hedonism partially mediate between meaningfulness and loyalty or recommendation. Involvement and refreshment partially mediate between meaningfulness and recommendation. Finally, knowledge and refreshment and knowledge and hedonism have a partial mediating effect between novelty or meaningfulness and loyalty or recommendation.

Discussion

This study makes three contributions to the existing literature on tourism experiences. First, this study contributes to extend the S-O-R framework by integrating the cognitive appraisal theory and incorporate stimuli and above all cognitive and emotional states not

employed in prior research, usually devoted to dominance, pleasure and arousal. Stimuli encompass not only object stimuli but also social psychological stimuli (Su, Hsu & Boostrom, 2020). Second, MTE (Kim, Ritchie & McCormick , 2012) is analyzed under the S-O-R framework concluding that in the stimulus of an astrotourism event leads to loyalty and recommendation. Third, the seven dimensions of MTE are tested in a new tourism experience context, astrotourism with the experiences happening at night in an outdoor rural setting. The 2012 Kim, Ritchie and McCormick's study concluded that individuals who perceive a tourism experience as memorable would more often recall the seven experiential dimensions (hedonism, novelty, local culture, refreshment, meaningfulness, involvement and knowledge). In the present study all the MTE dimensions are reorganized into a new model where novelty, local culture and meaningfulness act as stimuli (S), knowledge and involvement are the first appraisals (cognitive state), hedonism and refreshment act as the second appraisal (emotional state) and loyalty and recommendation are the response (R).

The first direct relationship between hedonism and refreshment with behavioral intentions show that both dimensions contribute for tourist loyalty and recommendation. To point out that hedonism plays an important role in creating the desire for tourists to return and become loyal. This model supports previous research findings regarding the positive link existing between positive emotions and tourist loyalty and WOM (Hosany, 2012; Serra-Cantallops, Ramon-Cardona & Salvi, 2018). According to path analysis all the hypothesis are confirmed except social culture which does not have positive relationship with involvement and knowledge. Although some previous studies consider social culture a dimension that contributes for memorable experiences (Kim, Ritchie & McCormick , 2012; Morgan and Xu, 2009; Szarycz, 2010), others (Tung & Ritchie, 2011; Wei, Zhao, Zhang, & Huang, 2019) quote that only social interaction which leads to the

development and sublimation of the tourist relationships can help to recollect travel experience. An astrotourism experience occurs in a dark setting and generally people try to stay quiet and in silence to focus on the observation and contemplation of the sky. For Edensor (2013) “the apprehension of darkness is conditioned by the propensities of the human eye to discern aspects of place and landscape in little or no light, as well as the position of the head at the top of the body with its two eyes looking forward as it moves through space” (p. 452). Aspects that imply the need of adaptation to the dark environment and also focus and concentration. Local culture is a dimension that becomes with interpersonal relationships may involve dialogue, physical contact and it is not possible within this context. Astrotourism is a niche ecotourism activity that involves contemplation. Previous studies such as Breiby and Slatten (2014) concluded that observing the aesthetic qualities of a nature-based setting had significant effects on positive emotions towards nature-based experiences and that that wilderness environments can heighten sensory awareness, creating more meaningful and deeper affective experiences (Frederickson & Anderson, 1999; McDonald Wearing & Ponting, 2009; Pearce, Strickland-Munro & Moore, 2017).

Managerial implication

Rural tourism destinations are facing an increasing competition creating the need to innovate and develop new tourism products to diversify the offer (Campón-Cerro, Hernandez-Mogollón & Alves, 2017). A wide range of different activities can contribute to increase the tourist's stay in these destinations. According Benur and Bramwell (2015) to diversification offers varied and customized experience products, flexibility in the planning and design of the destination experience and competitiveness through creating more complementarities, synergies, and economies of scope. Astrotourism is a tourism

activity that has been gaining an increase interest by rural destinations and there is an increasing number of destinations developing this type of tourism increasing also the competition among astrotourism destinations. Thus, a better understanding of the drivers of tourism loyalty is a very important requirement for astrotourism destinations to succeed in the tourism marketplace.

The findings of this research provide specific implication for practitioners such as astrotourism destination managers, tourism entrepreneurs and local authorities operating in astrotourism to attain success in this special interest tourism. Findings suggest that in order to create astrotourism loyalty entities developing astrotourism should not just focus on the development of the product but also offer a satisfying and highly valued tourist experience. The investment should be linked to valued tourist experiences, especially those that provide learning and uniqueness. Due to the importance of tourists' participation in learning experiences, astrotourism managers must create experiences that enable tourists to learn something new from the activities.

Astrotourism being developed at night aloud to create an attraction that places tourist in an environment that is totally different from their normal life and also that could provide some peace-of-mind for tourists while they experience the attraction. To do so, it is important that the managers provide safe, secure, environment in an easily accessible location. Since, the activities are developed at night it is important that tourists could feel safe at the destination and during the development of the activities.

Most astrotourism activities such as night sky observation do not imply social interaction between the group that is experiencing the activity because it is focused on the observations and explanations that the tour guide offer. Having qualified, skillful, and service- oriented staff is imperative. This is especially important because the knowledge necessary to provide interpretation (Weiler & Black, 2015) is very technical and specific

and by other side, most of the tourism entrepreneurs at rural destinations do not have much experience serving tourists. In such cases, destination tourism managers or local government, local associations or other specific entities could help to provide training to increase tourist relations skills among the astrotourism staff and other tourism entrepreneurs at the destination.

Limitations and directions for future research

Although the results of the current research provide pertinent theoretical as well as practical contributions to the field, this research has limitations that suggest future study directions. First, the current model was tested with visitors from Portugal, but astrotourism is a new tourism experience that is growing fast. Future studies may need to apply this model to other cultures and settings to determine if exist cultural differences. Second, astrotourism destinations develop tourism activities related to this theme also during the day, future research should also be developed including day and night activities for to understand differences between the dimensions of MTE. This study does not analyze the impact on satisfaction, future studies can add these constructs and paths in the model. Third, the research undertaken in tourism based on appraisal determinant emotions is very prolific in analyzing positive emotions such as in this study (Hosany, 2012; Kim & Chen, 2020; Loureiro, Stylos & Bellou, 2021; Prayag, Hosany & Odeh, 2013; Prayag, Hosany, Muscat, & Del Chiappa, 2015; Sthapit, 2019; Weiler & Chen, 2016), would be interesting future studies to study in which conditions a tourism experience could be stressful or bring negative emotions (Nawijn & Biran, 2019). Fourth, due to results of the present study future studies in astrotourism should focus on meaningfulness dimension of MTE focusing specifically in constructs such as awe (Pearce, Strickland-Munro, & Moore (2017) and peak experience (Maor & Mayseless,

2017) with comparison between different destinations and cultural background of the tourists.

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