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Examining the predictive validity of SUS-TAS with maximum parsimony in developing island countries

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ABSTRACT

The Sustainable Tourism Attitude Scale (SUS-TAS) has been used as a tool to gauge the sentiment of local residents toward sustainable tourism development. This scale has been validated in cross-cultural settings by several scholars. In a like manner, in order to validate this scale, data were collected in the Cape Verde islands (off the coast of Africa) and the results showed (1) a parsimonious version of the 21-item SUS-TAS that facilitates the process of data collection without compromising its robustness and psychometric properties, (2) a validated second-order factor model, confirming that the seven factors of SUS-TAS can be loaded in two broader dimensions named "perceived tourism impacts" and "expected tourism sustainability", (3) a SUS-TAS second-order factor model with validity in predicting residents' support for sustainable tourism development, (4) that SUS-TAS can be interpreted by seven individual factors and/or as a global factor as indicated by the hierarchical measurement model and predictive validity. Methodological and theoretical interpretations are discussed and future refinement and applications are also offered.

Introduction

Research on residents' attitudes concerning support for or opposition of tourism development is a ubiquitous topic in the tourism literature (Nunkoo, Smith, & Ramkissoon, 2013) and precedes the initial discussion of sustainable tourism (Boley & Perdue, 2012). However, it goes without saying that tourism is a global phenomenon which produces a massive number of social, economic and environmental impacts on the destination (Smallman & Moore, 2010). Since these impacts occur from global to local perspectives, they influence how host communities actually perceive tourism as well as their level of support for its development (Sinclair-Maragh & Gursoy, 2015). The effort to understand these impacts on host communities has led to the creation of scales to gauge host community attitudes toward sustainable tourism development (Choi & Sirakaya, 2005; Lankford & Howard, 1994). As such, Choi and Sirakaya (2005) developed and tested a Sustainable Tourism Attitude Scale (SUS-TAS), addressing a new paradigm shift that gauges the tenets of sustainable tourism development in a tourist destination. The authors argue that "sustainable tourism as an emerging paradigm seems to enhance the existing conceptual frameworks on tourism planning and development by making the residents its focal point" (p. 381).

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SUS-TAS is anchored in social exchange theory (SET) (Ap, 1992) and the new environmental paradigm (NEP) (Dunlap, Van Liere, Mertig, & Jones, 2000). In light of the support that each of these frameworks provides for the SUS-TAS, research has revealed some shortcomings with SET (Ward & Berno, 2011; Woosnam & Erul, 2017) and the NEP (Dunlap, 2008; Noblet, Anderson, & Teisl, 2013). Since its development, SUS-TAS has been replicated and validated across cultures and in different settings to test its robustness and psychometric properties (Sirakaya-Turk, 2007; Sirakaya-Turk & Gursoy, 2013; Sirakaya-Turk, Ekinci, & Kaya, 2008; Yu, Chancellor, & Cole, 2011; Zhang, Cole, & Chancellor, 2015). However, most of these studies have been carried out in developed countries and/or mature destinations rather than developing ones such as African island countries that are predominately emerging tourism destinations (Ribeiro, Valle, & Silva, 2013). Additionally, a lack of research exists regarding residents' attitudes and support for sustainable tourism in the developing world (Lee, 2013; Ribeiro, Pinto, Silva, & Woosnam, 2017). Such work would provide an accurate comprehension of residents' attitudes toward sustainable tourism and level of support. Tourism is an important socioeconomic sector for many developing islands countries and, in many cases, it is commonly regarded as the sole option for development. In this regard, the literature shows that a difference exists in residents' attitudes about tourism development when comparing studies in developing island countries and those in developed, mature destinations. This gap in the literature reinforces the need for more empirical research to be conducted on residents' attitudes in the developing world.

SUS-TAS was proposed as a new tourism paradigm to engage host communities in the process of sustainable tourism development and planning. In this way, residents must be encouraged to participate in and take great ownership throughout the sustainable tourism process within destinations, in essence, acting as the primary tourism stakeholder (Choi & Sirakaya, 2005). The involvement of host communities in the process of sustainable tourism development is important for the planning and success of development (Simmons, 1994), safeguarding a balanced and harmonious tourism development product. The new sustainable development paradigm, according to Choi and Sirakaya (2005), aims to include residents in full participation throughout the planning process and management for the destination. Ultimately, all parties involved can benefit as residents are actively involved in planning for tourism businesses and governments gain residents' support, and visitors' satisfaction is enhanced.

Tourism is a worldwide industry with recognized positive and negative impacts. The introduction of the principles of sustainable tourism development in destinations is paramount and has drawn the attention of managers, scholars and stakeholders of such destinations. Many studies examine local communities' support for tourism; their participation in tourism development and planning; sustainability of tourism development; sustainable tourism indicators; and economic, cultural and environmental impacts of tourism development (e.g. Nunkoo & Gursoy, 2012; Nunkoo & Ramkissoon, 2011; Stylidis & Terzidou, 2014; Twining-Ward & Butler, 2002); however, studies concerning residents' support for sustainable tourism development, specifically those in developing island countries, appear to have received little attention in the literature. Hence, there is a need for the understanding of residents' attitudes toward tourism and their behavior toward sustainable tourism development in these destinations.

In line with previous studies that successfully applied and validated SUS-TAS in different destinations and settings (e.g. Sirakaya-Turk & Gursoy, 2013; Sirakaya-Turk et al., 2008; Yu et al., 2011; Zhang et al., 2015), this study continues the process of validation and application of SUS-TAS by (1) creating a shortened version of the scale without compromising its psychometric properties and robustness, (2) proposing and testing a second-order factor model that allows a global interpretation, and (3) predicting the verification of SUS-TAS in residents' support for sustainable tourism development as a new criterion variable in a developing island country. In doing so, this study advances the current literature on residents' support for sustainable tourism and contributes to the further interpretation of SUS-TAS as a global factor.

Theoretical background

SUS-TAS dimensions and validation

Developed to gauge the central tenets of residents' attitudes toward sustainable tourism development in Western societies, SUS-TAS integrates the canons of SET, the NEP and sustainability (Choi & Sirakaya, 2005). This social measurement tool appears to have captured the major principles of the new paradigm of sustainable tourism. It was originally developed with data gathered randomly from 427 residents in a tourist city in Texas, using 44 items. The original 44-item scale encompasses seven dimensions with sound psychometric properties intending to capture host community attitudes toward sustainable tourism development: (1) social costs, (2) environmental sustainability, (3) long-term planning, (4) economic benefits, (5) ensuring visitor satisfaction, (6) community-based tourism, and (7) maximizing community participation. These seven dimensions of SUS-TAS seek to include the aspects of tourism development that should be consistent to accomplish sustainability in tourism growth that is "ecologically responsible, socially compatible, culturally appropriate, politically equitable, technologically supportive, and finally economically viable for the host community" (Choi & Sirakaya, 2005, p. 382).

SUS-TAS was originally developed in 2005, and Sirakaya-Turk et al. (2008) were the first to revalidate the scale in a cross-cultural setting using Turkish and Cypriot residents. In their study, the scale was reduced to 33 items. Sirakaya-Turk et al. (2008) found that the shortened version of SUS-TAS fit the data reasonably well in terms of its reliability and validity. However, when these authors analyzed each destination separately, the values of some indices were below the cut-off value recommended by Hu and Bentler (1999). In a new attempt, Yu et al. (2011) re-examined the 44-item SUS-TAS among residents in a rural setting in the USA. These authors validated the scale in terms of reliability and validity and developed a parsimonious version of the instrument with 27 items that showed a good fit of data. In the same way, Sirakaya-Turk and Gursoy (2013) created a shortened version of SUS-TAS with 21 items, and the model showed a satisfactory reliability and validity, despite the fact that two fit indices presented values below recommended cut-off values. Most recently, Zhang et al. (2015) reassessed SUS-TAS in an attempt to create and validate a parsimonious version with predictive validity and explored some global facilitation and interpretation of SUS-TAS. With data collected in 11 Midwestern counties in the USA, these scholars created a maximum parsimonious 20-item SUS-TAS with strong psychometric properties. This new shortened version fit the data well and demonstrated robust reliability and validity. Concomitantly, they concluded that SUS-TAS was better interpreted by using the seven factors individually rather than as one unique dimension.

Since SUS-TAS has been validated in different cultural settings, several scholars have applied the newly created tool in different research contexts to understand residents' attitudes toward sustainable tourism development. Some of these studies concentrate on a descriptive analysis of the attitudes of host communities and other stakeholders toward tourism. Hung, Sirakaya-Turk, and Ingram (2011), using the 33-item SUS-TAS validated by Sirakaya-Turk et al. (2008), made use of cluster analysis to profile and identify three typologies of residents in Turkey regarding their attitudes toward sustainable tourism. Likewise, in a study in Cyprus, Kvasova (2011) identified variations on environmental concerns and behavior between Swedish and Russian visitors based on tourism-related environmental attitudes of the original 44-item SUS-TAS. Prayag, Dookhony-Ramphul, and Maryeven (2010) selected some items from SUS-TAS and from the perceived tourism impacts scale from Dyer, Gursoy, Sharma, and Carter (2007) to analyze the sustainability-oriented perceptions of hoteliers in Mauritius.

It is widely recognized that validation is an imperative first step before a scale can be taken seriously as a valuable research instrument and recommended in theory development (Hinkin, Tracey, & Enz, 1997). Therefore, some researchers, including Sirakaya-Turk (2007), recommended that SUS-TAS should be used as an independent variable to predict other theoretically related variables, as a necessary precondition to verifying the predictive validity of SUS-TAS. Similarly, Sirakaya-Turk and Gursoy (2013) partially verified the predictive validity of the 21-item SUS-TAS, resulting in a significant relationship between five SUS-TAS dimensions (environmental sustainability and perceived social cost were statistically insignificant) and two pro-sustainability factors. Likewise, Zhang et al. (2015) fully

confirmed the predictive validity of the 20-item SUS-TAS by analyzing the correlation of the seven SUS-TAS dimensions on residents' level of intentions to be involved in tourism planning. These authors found that the SUS-TAS dimensions all showed a significant relationship with the outcome variable, which validated the predictive validity of the scale. Since these criterion variables are not an end concerning pro-sustainability behaviors, additional research should re-examine the predictive validity of SUS-TAS using other alternative, sustainable, supportive tourism development behaviors for cross-validation.

Maximizing the parsimony of SUS-TAS

Creating shortened versions of saturated and complex scales in research has increased considerably in the last decade in order to improve the efficiency of testing (Kruyen, Emons, & Sijtsma, 2013). This strong interest in parsimonious versions of scales is partially because of their practical advantages in reducing respondent burden of time (Leite, Huang, & Marcoulides, 2008), as well as to allow for the inclusion of additional questions within survey instruments. Furthermore, a large and complex scale is questionable because it is heavily dependent on the valuation of data and is thus less rigorous in terms of theory (Messick, 1995; Mulaik et al., 1989). The factor structure should be as simple as possible, comprising a reasonable number of items that effectively gauge the essence of the construct (Thurstone, 1947). In this sense, several scholars (i.e. Burisch, 1997; Gerbing & Anderson, 1988; Rossiter, 2002) encourage the use of shorter scales. Burisch (1997) demonstrated empirically that shorter versions of scales (three to eight items) can outperform much longer scales. However, Mowen and Voss (2008) pointed out that if a scale has constructs, each construct should have three to five items. These same scholars additionally argue that shorter scales are necessary when a hierarchical approach is under consideration. Ideally, a minimum of three items should be retained for most constructs, but the ultimate decision should be determined by the scale's construct validity (Raubenheimer, 2004). As recommended by several authors (e.g. Coste, Guillemin, Pouchot, & Fermanian, 1997; Smith, McCarthy, & Anderson, 2000; Stanton, Sinar, Balzer, & Smith, 2002) to create a shortened version of an extant scale, the combined use of statistics-driven strategies and a judgmental approach should be employed.

Initially, the definition of the construct needs to be such that the most important items for assessing the construct can be identified. Using this definition, experts should assess the validity of each item, and statistical methods should assess the experts' degree of agreement (see also American Educational Research Association, 1999, p. 19). Following this, researchers should decide which items to include in the shortened version based on the judgment of these experts and additional statistical evidence with respect to the contribution of every item to the reliability and the validity of the restricted scale. In said indication, the 21-item SUS-TAS (Sirakaya-Turk & Gursoy, 2013) and 20-item SUS-TAS (Zhang et al., 2015) demonstrated good parsimony. As such, further attempts should be made to develop a version of this model with reasonable parsimony of the 21-item SUS-TAS and guarantee that all constructs have at least three items (Mowen & Voss, 2008), and good model fit, while retaining the psychometric robustness and conceptual identity of the full-length scale.

SUS-TAS predictive validity in predicting residents' support for sustainable tourism development

Sustainable tourism development is one of the most researched topics within the tourism literature and has been at the heart of tourism planning and management throughout the last two decades. The genesis of sustainable tourism is rooted in the concept of sustainable development that emerged in the global arena through the Brundtland Report (WCED, 1987). Therefore, the concept of sustainable development outcomes remains problematic and continues to evoke emotive debate. According to Jayawardena, Patterson, Choi, and Brain (2008, p. 258), "Sustainable tourism works to strike a balance between protecting the environment, maintaining cultural integrity and promoting

economic benefits in both developed and emerging nations". However, Choi and Sirakaya (2006, p. 1286) proposed a concept which broadens the components for some further aspects, emphasizing that, "Sustainable tourism development should be ecologically responsible, socially compatible, culturally appropriate, politically equitable, technologically supportive and, finally, economically viable for the host community". Despite these concepts of sustainable tourism, its definition is still the objective of vigorous debate (Sharpley, 2000) and it "has become something of a cottage industry in the academic literature of late" (Garrod & Fyall, 1998, p. 118). However, the residents' attitudes toward tourism have been an important tool for sustainable tourism (Choi & Sirakaya, 2005).

In the past, tourism was focused in maximizing the economic benefits while ignoring the negative impacts that affect the environment and the residents' life (Andereck & Nyaupane, 2011). However, the success of tourism is dependent on the active support of residents (Gursoy & Rutherford, 2004) without which the sustainability of tourism is threatened (Nunkoo & Ramkissoon, 2011). Recently, sustainable tourism has emerged as a new paradigm, and, according to Choi and Sirakaya (2005), this paradigm shift "seems to enhance the existing conceptual frameworks on tourism planning and development by making the residents its focal point" (p. 381).

Notwithstanding the existence of a consolidated body of research providing a thorough examination of residents' attitudes and support for tourism development (i.e. Akis, Peristianis, & Warner, 1996; Gursoy & Rutherford, 2004; Nunkoo & Gursoy, 2012; Nunkoo & Ramkissoon, 2011; Pan, Zhang, Gursoy, & Lu, 2017; Ribeiro et al., 2013, 2017; Sinclair-Maragh & Gursoy, 2015; Sirakaya, Teye, & Sönmez, 2002; Stylidis & Terzidou, 2014; Vargas-Sánchez, Valle, Mendes, & Silva, 2015), comprehensive analyses of residents' support toward sustainable actions in tourism development are relatively recent (Choi & Murray, 2010; Kitnuntaviwat & Tang, 2008; Lee, 2013; Nicholas, Thapa, & Ko, 2009). Studies investigating residents' support for tourism development have considered SET as the primary theoretical framework for explaining relationships among variables within numerous models (Nunkoo et al., 2013). As stated by Ap (1992), SET provides a conceptual basis by which to understand the exchange of resources between individuals and groups, and it is also an effective framework for analyzing residents' attitudes toward sustainable tourism development (Kitnuntaviwat & Tang, 2008). Based on this theory, the level of benefit from such exchanges will influence residents' attitudes toward sustainable tourism, and they are expected to support and participate in additional sustainable community tourism development (Poudel, Nyaupane, & Budruk, 2016). However, if residents perceive that sustainable community tourism development creates more negative than positive impacts, they will oppose this kind of development (Ap, 1992; Choi & Sirakaya, 2005; Gursoy, Jurowski, & Uysal, 2002; Jurowski, Uysal, & Williams, 1997; Lee, 2013; Nunkoo & Ramkissoon, 2011).

In light of this theory (at the individual level, those persons with tourism-related jobs or having a closely related family member employed in the industry show a more positive attitude toward tourism development and are more likely to support it (Haley, Snaith, & Miller, 2005; Haralambopoulos & Pizam, 1996; Ribeiro et al., 2013, 2017)). At the community level (besides the economic benefits), both environmental and sociocultural aspects have been noted as important influences on attitudes about tourism development (Andriotis & Vaughan, 2003; Gursoy & Rutherford, 2004). Many scholars have found that the benefits of tourism significantly and positively affect support for tourism development (Gursoy & Kendall, 2006; Gursoy & Rutherford, 2004; Gursoy et al., 2002; Kaltenborn, Andersen, Nellemann, Bjerke, & Thrane, 2008; Nicholas et al., 2009; Ribeiro et al., 2017), whereas the negative impacts significantly and negatively influence support for tourism development (Gursoy & Kendall, 2006; Gursoy & Rutherford, 2004; Gursoy et al., 2002; Nicholas et al., 2009; Nunkoo & Gursoy, 2012; Nunkoo & Ramkissoon, 2011; Ribeiro et al., 2017; Stylidis & Terzidou, 2014). Despite these findings, as far as we know, no study exists that focuses on attitudes toward tourism development examining the use of the seven SUS-TAS factors (as predictors to measure residents' support for sustainable tourism) within developing island countries that are emerging tourist destinations. Such work would address the recommendation to do so by Sirakaya-Turk et al. (2008). However, in analyzing SUS-TAS dimensions (and in line with Zhang et al., 2015), the seven constructs should represent two dimensions of residents' attitudes toward sustainable tourism development. The first dimension,

perceived tourism impacts (*PTIs*), is composed of three constructs: *perceived economic benefits*, *perceived social costs* and *perceived environmental sustainability*. The second dimension, *expected tourism sustainability* (*ETS*), is made up of the remaining four constructs: *community-centered economy*, *long-term planning, ensuring visitor satisfaction* and *maximizing community participation*. The use of SUS-TAS goes beyond the perceived costs and benefits as antecedents of residents' support toward sustainable tourism development. Both PTI and ETS are likely to predict residents' support toward sustainable tourism development.

Methods

Study setting

Cape Verde is a small archipelago of ten islands (one uninhabited) situated in the Atlantic Ocean, 550 km off the coast of Western Africa, with an estimated population of 491,475 people (National Institute of Statistics [NIS], 2011). Since its independence from Portugal 1975, the economy of Cape Verde has been heavily dependent upon foreign aid for development, migrant remittance and small-scale fishing and agriculture industries (López-Guzmán, Borges, Hernandez-Merino, & Cerezo, 2013; Ribeiro et al., 2017). In order to mitigate the Cape Verdean economic dependency and reduce the flux of migrant workers, the country developed an initiative to develop the Indigenous economy by opening up to foreign direct investments (specifically in the way of air transport infrastructure, energy, and private sector tourism investments) as a means to achieve sustainable growth and development (Mitchell & Li, 2017). By doing so, large hotels and resorts have been built mainly on the islands of Sal and Boa Vista, driven mostly by foreign investors. In addition, the government has invested heavily in the tourism sector as a primary driver of economic development, building infrastructure like roads, international airports (on the islands of Santiago, Boa Vista, and, more recently, São Vicente), ports for cruise ships, transport systems, security, reforms in law, new regulations and tax incentives for investors in an effort to boost this industry.

Cape Verde has received a significant amount of international tourists, growing from 145,000 arrivals in 2000 to 599,487 in 2016 (NIS, 2016). Historically, tourists have originated primarily from European countries, such as the United Kingdom (20.5%), Germany (11.1%), Portugal (10.1%), France (10.1%) and the Netherlands/Belgium (9.7%) (NIS, 2016). The tourism industry is heavily concentrated on the islands of Sal and Boa Vista, which most recently welcomed 77.2% of the country's international tourists in 2016 (NIS, 2017). The tourism industry is the pillar of economic and social development, comprising approximately 20.8% of the GDP while employing 20.1% of the workforce (NIS, 2015).

Survey instrument

In order to measure the 44-item SUS-TAS (Choi & Sirakaya, 2005) on the Cape Verde islands, a survey instrument was designed for residents. Participants were asked to state their level of agreement with a number of questions on a five-point Likert scale (1 = strongly disagree and 5 = strongly agree). In order to evaluate support for sustainable tourism development, five items were utilized from the work of Nicholas et al. (2009) and Lee (2013) to assess their intentions to support sustainable tourism development in Cape Verde. Moreover, general sociodemographic variables were also included in the questionnaire to profile the sample respondents. Questionnaire items were originally written in English and were translated into Portuguese by the researchers and then back-translated into English by a native speaker. Following this, two tourism experts, proficient in both English and Portuguese, reviewed the translation to ensure that the translated version reflected the meaning and intent of the original items (following recommendations by Brislin, 1970). Prior to data collection, the questionnaire was pre-tested among 50 residents on the island of Boa Vista. Results revealed no major problem with items, only minor modifications regarding administration of instruments.

Data collection and sample profile

In order to demonstrate that SUS-TAS is a useful instrument in capturing residents' attitudes toward sustainable tourism, a survey was applied to individuals at least 18 years of age residing in Cape Verde. The survey was carried out on the islands of Boa Vista and Sal using a quota sampling approach with the sample distributed in proportion to the population's distribution by gender and age group. Questionnaires were administered to residents face-to-face by the first investigator of this paper over a four-week period during August and September 2013. Respondents were approached at random in streets, residents' houses, coffee shops, terraces, offices, public parks, etc. A total of 446 surveys were administered to residents on these two islands. However, incomplete surveys were discarded from the analysis with knowledge that missing data has the potential to create bias in statistical results (Hair, Black, Babin, & Anderson, 2014). A total of 28 surveys were discarded with 418 remaining for statistical analysis.

The sample comprised nearly equal percentages of men and women (Table 1). The majority of respondents (72.2%) were between 18 and 39 years old, and 48.3% were married or living with a

Table 1. Descriptive summary of sociodemographic profile of respondents.

Demographic	n	%
Gender (n = 418)		
Male	208	49.7
Female	210	50.3
Island of residence		
Boa Vista	200	47.8
Sal	218	52.2
Age (n = 418, M = 32.3 years of age)		
$\leq$39	304	72.7
40–64	96	23.0
$\geq$65	18	4.3
Marital status		
Married/Living with a partner	202	48.3
Single	197	47.1
Divorced/Separated	15	3.6
Widowed	4	1.0
Education (n = 418, median = Secondary education)		
Elementary education	64	15.3
Secondary education	282	67.5
Higher education	72	17.3
Training/Qualification in tourism (n = 418)		
Yes	97	23.2
No	321	76.8
Job (n = 415)		
Tourism-related job	207	49.1
Non-tourism-related job	208	50.9
Place of birth (n = 418)		
Boa Vista or Sal	201	48.1
Other islands	196	46.9
Abroad	21	5.0
Years lived on the island (n = 206)		
$\leq$5 year of residence	93	45.1
6–10 years	54	26.2
11–15 years	37	18.0
$\geq$16 years of living	22	10.7
Reasons for change (n = 214)		
Professional	167	78.0
Family	28	13.2
Personal	11	5.1
Educational	8	3.7

partner. Slightly more than two out of three individuals studied up to the secondary level. Nearly one-fourth of the sample had some qualification/training in tourism, and 49.1% had a tourism-related job. Regarding place of residence, 51.9% were born on other Cape Verdean islands or abroad and 78.0% moved to these islands for professional reasons. From those who moved to these two islands, 45.1% had lived on the islands for less than 6 years. Finally, only 5% of participants held foreigner passports and had a tourism-related job.

Results

Validation of SUS-TAS with maximum parsimony: a CFA

Construct validity is an essential condition for theory testing and development of quality measures in social sciences (Brown, 2015; Steenkamp & van Trijp, 1991). Therefore, in order to provide further evidence of the validity of the SUS-TAS instrument in the Cape Verde islands, confirmatory factor analysis (CFA) was undertaken to provide a test of validity and reliability for the various constructs (Hair et al., 2014). CFA provides a rigorous test of the proposed scales in analyzing how well the measured items represent a reduced number of constructs (Hair et al., 2014). CFA has similar characteristics to EFA but philosophically it is distinctly different (Brown, 2015). The former provides information to the researcher about "how well one's theoretical specification of the factors matches reality (actual data). In a sense, CFA is a tool that enables researchers to either validate or reject one's preconceived theory" (Hair et al., 2014, p. 603). Using data collected in the Cape Verde islands ($n = 418$), CFA was performed on SUS-TAS using the maximum likelihood (ML) method in AMOS 22.0. The overall fit for the measurement model was assessed using a number of goodness-of-fit indices. According to Hair et al. (2014, p. 576), "goodness-of-fit indicates how well a specified model reproduces the observed covariance matrix among the indicator terms". The measurement model for the 44-item SUS-TAS was assessed by examining the overall model fit of CFA. The chi-square (χ^2) test and several goodness-of-fit indices were examined, including the normed χ^2, comparative fit index (CFI), Tucker–Lewis Index (TLI), root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMR) (Hair et al., 2014). A ratio of 2.5 to 3 is recommended for the χ^2/df and the recommended cut-off values for a good model fit are TLI > 0.95, CFI > 0.95, RMSEA < 0.08 and SRMR < 0.08 (Hair et al., 2014; Hu & Bentler, 1999).

In order to reduce the data with maximum parsimony into a smaller and more meaningful set of items, several CFAs (see Table 2) were conducted through data collected on Boa Vista and Sal, using the original 44-item SUS-TAS of Choi and Sirakaya (2005). However, prior to undertaking the CFA, normality assumptions were checked, analyzing the value of both skewness and kurtosis of the measures. The values of these two measures of asymmetry were well below their recommended cut-off of 2 and 7, respectively (Curran, West, & Finch, 1996), confirming the suitability of the data collected in Cape Verde.

The CFA for the measurement model with the original 44 items revealed an acceptable fit index to the data collected in Cape Verde ($\chi^2/df = 1.54$; TLI = 0.97; CFI = 0.97; RMSEA = 0.038, SRMR = 0.034). Although the fit indices were within an acceptable range, the standardized weight of one item in the perceived cost of tourism was extremely low (0.25 for Item PSC8). In an attempt to improve the model fit and develop a parsimonious version of this instrument, some items with loading above

Table 2. Fit indices of measurement comparisons ($n = 418$).

SUS-TAS	χ^2	df	p-Value	TLI	CFI	RMSEA	SRMR	AIC	BCC
44-Item	1319.5	859	0.001	0.97	0.97	0.038	0.034	1581.45	1613.14
33-Item	746.7	465	0.000	0.97	0.98	0.036	0.030	938.69	955.64
27-Item	384.27	294	0.000	0.99	0.99	0.027	0.027	552.53	564.62
21-Item	216.23	168	0.007	0.99	0.99	0.026	0.025	342.23	349.25
Second-order	248.01	178	0.000	0.99	0.99	0.031	0.045	354.01	359.91
One-factor	3589.00	189	0.000	0.35	0.41	0.208	0.146	3844.89	3677.68

0.70 and R^2 lower than 0.55 were deleted and modification indices produced by AMOS were used to improve the fit of the measurement model (Hair et al., 2014). Next, the revised CFA was conducted on the remaining set of items and a 33-item scale was retained maintaining the seven factors of SUS-TAS (Table 2). Compared with the results obtained in Sirakaya-Turk et al. (2008), the 33-item SUS-TAS obtained in our study showed a better statistical fit, indicating that the model adequately fit the data ($\chi^2/df = 1.61$; $p = 0.000$; TLI = 0.97; CFI = 0.98; RMSEA = 0.036; SRMR = 0.030). Based on these fit indices, the 33-item SUS-TAS showed a good fit of the sample data collected in Cape Verde.

In line with some recommendations to reduce the items of SUS-TAS and with the intent of improving the fit indices associated with the 33-item model, a 27-item model was generated. Based on the previous model, six items with lower factor loadings were deleted to better fit the indices. Therefore, in comparison with the study developed by Yu et al. (2011) suggesting a 27-item model, the data setting of the current study also shows better overall fit indices with $\chi^2/df = 1.31$; $p = 0.000$, TLI = 0.99, CFI = 0.99, RMSEA = 0.027, SRMR = 0.027. Furthermore, in an attempt to create a shortened version of SUS-TAS with improved parsimony as recommend by Sirakaya and Gursoy (2013) and Zhang et al. (2015), a 21-item SUS-TAS with seven factors was developed by deleting six items with lower factor loadings. The data for the current study show better overall fit indices than those for the 21-item model presented by Sirakaya and Gursoy (2013) and the 23-item and 21-item models presented by Zhang et al. (2015): $\chi^2/df = 1.29$; $p = 0.007$; TLI = 0.99; CFI = 0.99; RMSEA = 0.026; SRMR = 0.025. Since all regression weights were significant ($p < 0.001$), no modification was made.

Further comparison of SUS-TAS$_{44\text{-item}}$, SUS-TAS$_{33\text{-item}}$, SUS-TAS$_{27\text{-item}}$ and SUS-TAS$_{21\text{-item}}$ suggested that SUS-TAS$_{21\text{-item}}$ was the best-fitting model. Furthermore, goodness-of-fit measures that take parsimony into account as well as fit, such as the Akaike information criterion (AIC) (Akaike, 1987) and the Browne–Cudeck criterion (BCC) (Browne & Cudeck, 1989), "can also be used regardless of whether models can be ordered in a nested sequence or not" (Jöreskog, 1993, p. 306). Furthermore, SUS-TAS$_{21\text{-item}}$ had the lowest AIC and BCC of all models considered, suggesting that it was the best-fitting and most parsimonious measurement model.

Twenty-one-item SUS-TAS validation: first-order CFA

A primary reason to perform CFA is to assess the construct validity of a proposed measurement model. According to Bagozzi and Yi (2012), construct validity "is the extent to which indicators of a construct measure what they are purported to measure" (p. 18). In this study, construct validity was assessed in terms of content, convergent and discriminant measures. Despite content validity being measured in prior studies (see Choi & Sirakaya, 2005; Sirakaya-Turk et al., 2008), here content validity was assessed by having the researchers translate items into Portuguese and a native English speaker back-translate them before they were reviewed by two tourism experts and Cape Verdeans residents to guarantee the translated version reflected the same content (meaning) as the original one, which was confirmed (Brislin, 1970; DeVellis, 2012).

Convergent validity is the logical implication that multiple measures of the same phenomenon should be highly correlated (Bagozzi & Yi, 2012) and that all factor loadings should be equal to or higher than the cut-off value of 0.50 and statistically significant (Fornell & Larcker, 1981). As depicted in Table 3, all items exceeded 0.50, ranging from 0.75 to 0.92 and were statistically significant at the 0.001 level (two-tailed). Convergent validity is also verified if the average variance extracted (AVE) for all constructs is greater than the cut-off value of 0.50 (Fornell & Larcker, 1981; Hair et al., 2014). Table 3 shows the results of SUS-TAS$_{21\text{-item}}$, indicating that the AVE values for the seven constructs of SUS-TAS exceeded the 0.50 cut-offs, ranging from 0.61 to 0.84, with R^2 in good order. The other criterion to measure convergent validity is calculating the construct reliability (CR). The reliability of SUS-TAS$_{21\text{-item}}$ was then measured by examining Cronbach's alpha (α) and by checking the values of composite reliability estimates. Cronbach's alpha, ranging from 0.82 to 0.94, indicated an acceptable internal consistency across the items. Hair et al. (2014) recommend the use of CR when using CFA analysis because CR incorporates measurement error into the calculations. These authors point to

Table 3. Summarized results of the 21-item SUS-TAS CFA.

Factor and items	Factor loading	Error variance	R^2	AVE	(CR)	MSV	ASV
Perceived environmental sustainability ($\alpha = 0.93$)				0.82	0.93	0.01	0.00
Our environment must be protected now and for the future	0.93[*]	0.13	0.87				
Tourism must protect the community environment	0.92[*]	0.15	0.85				
Tourism must improve the environment for future generations	0.87[*]	0.25	0.75				
Perceived economic benefit ($\alpha = 0.94$)				0.84	0.94	0.32	0.16
Tourism is a strong economic contributor to the community	0.95[*]	0.11	0.89				
Tourism diversifies our economy	0.94[*]	0.12	0.88				
Tourism benefits other industries in the community	0.86[*]	0.26	0.74				
Perceived social costs ($\alpha = 0.83$)				0.75	0.90	0.24	0.12
My quality of life has deteriorated because of tourism	0.92[*]	0.16	0.84				
Tourists in our community disrupt my quality of life	0.89[*]	0.20	0.80				
I feel uncomfortable or unwelcome in local tourism businesses	0.78[*]	0.39	0.61				
Long-term planning ($\alpha = 0.91$)				0.78	0.91	0.27	0.15
We need to take a long-term view when planning for tourism development	0.90[*]	0.18	0.82				
Successful management of tourism requires advanced planning strategy	0.91[*]	0.17	0.83				
When we plan for tourism, we cannot be shortsighted	0.83[*]	0.31	0.69				
Community-centered economy ($\alpha = 0.91$)				0.78	0.92	0.12	0.05
Communities' residents should receive a fair share of benefits from tourism	0.89[*]	0.20	0.80				
Communities' residents should be given more opportunities to invest in tourism development	0.88[*]	0.23	0.77				
Tourism industry must contribute to community improvement	0.88[*]	0.22	0.78				
Ensuring visitor satisfaction ($\alpha = 0.87$)				0.70	0.88	0.44	0.17
Tourism industry must ensure good quality tourism experiences for visitors	0.88[*]	0.23	0.77				
It is the responsibility of tourism businesses to meet visitor needs	0.82[*]	0.33	0.67				
Community attractiveness is a core element of ecological "appeal" for visitors	0.82[*]	0.33	0.67				
Maximizing community participation ($\alpha = 0.82$)				0.61	0.82	0.44	0.20
Full participation by everyone in the community is a must for successful tourism development	0.83[*]	0.31	0.69				
Communities' residents should have an opportunity to be involved in tourism decision-making	0.75[*]	0.43	0.57				
Tourism decisions must be made by all in communities regardless of a person's background	0.75[*]	0.43	0.57				

α = Cronbach's alpha; AVE = average variance extracted; CR = composite reliability; MSV = maximum shared squared variance; ASV = average shared squared variance.

[*]$p < 0.001$.

0.70 as the cut-off value. As depicted in Table 3, CR values for all latent variables exceeded 0.70, ranging from 0.82 to 0.94, and thus indicating a significant level of internal consistency for the constructs, which shows that the seven factors of SUS-TAS$_{21\text{-item}}$ have a robust convergent validity.

Discriminant validity refers to the degree to which the measures of different concepts or constructs are divergent (Hair et al., 2014). To further assess the discriminant validity of SUS-TAS$_{21\text{-item}}$, the procedures created by Fornell and Larcker (1981) were followed. The AVE value for each construct was compared with the squared correlations between paired constructs (see Table 4), demonstrating that each construct is statistically different from the others, suggesting evidence for discriminant validity (Fornell & Larcker, 1981; Hair et al., 2014). With support for content validity, convergent validity and discriminant validity, construct validity for the SUS-TAS$_{21\text{-item}}$ model is therefore adequately established (O'Leary-Kelly & Vokurka, 1998).

Table 4. Discriminant validity for the 21-item SUS-TAS first-order CFA.

Constructs	1	2	3	4	5	6	7
1. Perceived economic benefits	**0.87**						
2. Perceived environmental sustainability	0.52	**0.79**					
3. Perceived social costs	0.32	0.28	**0.74**				
4. Community-centered economy	0.39	0.67	0.16	**0.85**			
5. Long-term planning	0.47	0.54	0.26	0.51	**0.90**		
6. Ensuring visitor satisfaction	0.48	0.36	0.29	0.24	0.33	**0.87**	
7. Maximizing community participation	0.22	0.21	0.40	0.22	0.19	0.33	**0.89**

Note: The bold diagonal elements are the square root of the variance shared between the constructs and their measures. Off-diagonal elements are the correlations between constructs.

Twenty-one-item SUS-TAS validation: second-order CFA

In order to test the second-order measurement model, a hierarchical CFA with *PTIs* and *ETS* was modeled as an interrelated construct. The results presented in Table 2 show that the second-order measurement model fit the data well: $\chi^2 = 248.01$; $df = 178$; $\chi^2/df = 1.39$; $p < 0.001$; CFI = 0.99; TLI = 0.99; RMSEA = 0.031; SRMR = 0.045. Since the construct validity and reliability of all seven factors of SUS-TAS were measured in the first-order CFA, here the focus of the analysis is mainly on the assessment of the two second-order factors: *PTIs* and *ETS*. As depicted in Table 5, the standardized loadings of three dimensions of *PTIs* were all significant ($p < 0.001$). Similarly, the four underlying dimensions of *ETS* showed similar results. In a like manner, the moderated high *t*-values show that these first-order factors were significant indicators of their corresponding second-order constructs ($p < 0.001$). Additionally, the AVEs of both *PTIs* and *ETS* are above the recommended threshold of 0.50 (Hair et al., 2014), giving support to convergent validity. These two second-order factors also achieved discriminant validity, as the square root of the AVE for each construct was higher than its correlation with other constructs (Fornell & Larcker, 1981).

Predictive validity of SUS-TAS in determining residents' support for sustainable tourism development

After the measurement model (first- and second-order) validity was confirmed, the predictive validity of SUS-TAS$_{21\text{-item}}$ loaded onto a second-order sustainable attitudinal factor was examined by assessing how this multidimensional construct is associated with other conceptually related variables. Predictive validity "is the ability of a measuring instrument to estimate some criterion that is external to the measuring instrument itself" (Sirakaya-Turk, 2007, p. 1082). This study used residents' support toward sustainable tourism as a predictive variable. In the questionnaire, residents were asked to rate their level of support or opposition toward sustainable tourism development using five items:

Table 5. Second-order measurement model for perceived tourism impacts and expected tourism sustainability.

	β	*t*-Value	AVE	CR
Perceived tourism impacts			0.71	0.87
Perceived economic benefits	0.69	N/A[a]		
Perceived environmental sustainability	0.29	4.74[*]		
Perceived social costs	−0.35	−5.18[*]		
Expected tourism sustainability			0.71	0.88
Community-centered economy	0.85	N/A		
Long-term planning	0.74	11.15[*]		
Ensuring visitor satisfaction	0.42	6.85[*]		
Maximizing community participation	0.62	9.80[*]		

AVE = average variance extracted; CR = composite reliability.
[a]In AMOS, one loading needs to be fixed to 1; therefore, the *t*-value for this dimension cannot be computed.
[*]$p < 0.001$.

Table 6. Results from SUS-TAS predicting residents' support for sustainable tourism.

Path	β	t-Value
Perceived economic benefits → Perceived tourism impacts	0.61	N/A
Perceived environmental sustainability → Perceived tourism impacts	0.29	4.74[*]
Perceived social costs → Perceived tourism impacts	−0.35	−5.18[*]
Community-centered economy → Expected tourism sustainability	0.85	N/A
Long-term planning → Expected tourism sustainability	0.74	11.15[*]
Ensuring visitor satisfaction → Expected tourism sustainability	0.42	6.85[*]
Maximizing community participation → Expected tourism sustainability	0.62	9.80[*]
Perceived tourism impacts → Support for sustainable tourism	0.29	7.93[*]
Expected tourism sustainability → Support for sustainable tourism	0.34	7.97[*]

Model fit statistics							
χ^2	df	χ^2/df	p-Value	TLI	CFI	RMSEA	SRMR
438.96	255	1.72	0.000	.097	0.97	0.042	0.069

CFI = comparative fit index; TLI = Tucker–Lewis Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.
[*]$p < 0.001$.

development of community-based tourism initiative, regulatory environmental standards to reduce the negative impacts of tourism, cultural exchange between residents and visitors, cooperation and unity in tourism planning, and promotion of environmental education and conservation. However, one item had to be discarded as the factor loading was lower than 0.40. Internal consistencies of the remaining items were satisfactory ($\alpha = 0.82$). In line with the contemporary development, the sustainable tourism paradigm can be a powerful development tool for a better future world for both residents and visitors (Blancas, Lozano-Oyola, González, & Caballero, 2016; Choi & Sirakaya, 2005). As such, residents may express supportive pro-sustainable tourism development behavior for long and equitable development in these islands.

The correspondence between the predictive variable support for sustainable tourism development and the second-order factor model of SUS-TAS$_{21\text{-item}}$ was examined through structural equation modeling (SEM). Results of the standardized coefficients and the t-statistics are depicted in the upper part of Table 6. Model fit indices of the structural model are shown in the bottom part of the same table. The results showed a good fit for the structural model: $\chi^2 = 238.96$, $df = 255$, $p < 0.001$, CFI = 0.97, TLI = 0.97, RMSEA = 0.042 and SRMR = 0.069). Thus, the predictive validity of second-order factors of SUS-TAS was confirmed while examining the relationship between the two hierarchical factor dimensions of SUS-TAS and support for sustainable tourism.

In theory, each SUS-TAS dimension should be significantly related to support for sustainable tourism through PTIs and *ETS*. The results suggest that of the seven dimensions of SUS-TAS, six significantly and positively predict support for sustainable tourism development via hierarchical factors. Conversely, however, *perceived social cost* exerted a negative and significant influence on PTIs. Accordingly, these findings were consistent with the theoretical conceptualizations used in this study and provide additional validity for SUS-TAS in relation to support for sustainable tourism development.

The seven-dimensional structure of SUS-TAS$_{21\text{-item}}$ was assessed for the potential existence of common method variance (CMV) bias. This was undertaken since each questionnaire was completed by a single respondent. In doing so, *Herman's single factor test* was used to examine CMV (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The test requires loading of all 21-item into a single common latent factor to examine whether a single factor can explain the majority of the variance in the data. Table 2 depicts the fit indices of one factor-model ($\chi^2 = 3589.00$; $df = 189$; $\chi^2/df = 18.99$; $p < 0.001$; CFI = 0.35; TLI = 0.41; RMSEA = 0.208; SRMR = 0.146) showing that the proposed seven dimensions of SUS-TAS$_{21\text{-item}}$ fits meaningfully better than the common factor model, suggesting that CMV is not a pervasive issue in this study.

Discussions

The aim of this study was to describe the development and validity of a psychometrically robust short-form of SUS-TAS, considering a non-Western context. As noted in the literature, most studies on attitudes to the impacts or impact scales to date have been developed using data collected in the developed world (Choi & Sirakaya, 2005; Dyer et al., 2007; Lankford & Howard, 1994). Despite the fact that the tourism literature includes many studies of residents' attitudes toward tourism development, the first- and second-order validation of a parsimonious version of SUS-TAS and the more insurgent form of validity (i.e. predictive validity) with residents' support for sustainable tourism development are largely non-existent in the literature. As recommended by Choi and Sirakaya (2005) and corroborated by several other scholars (i.e. Sirakaya-Turk, 2007; Sirakaya-Turk & Gursoy, 2013; Sirakaya-Turk et al., 2008; Yu et al., 2011; Zhang et al., 2015), this instrument should be tested in different cultures, contexts and destinations at different levels of tourism development before recommending it as a universal tool for measuring residents' attitudes toward sustainable tourism. As SUS-TAS has shown strong psychometric properties (see Choi & Sirakaya, 2005; Sirakaya-Turk, 2007; Sirakaya-Turk et al., 2008; Yu et al., 2011; Zhang et al., 2015), it is widely recognized as a comprehensive instrument to measure sustainability from the perspective of local residents. This study is the first attempt to examine the merit of a shorter version of SUS-TAS within the residents' behavior model in a developing island country. However, the current study analyzes and tests several versions of the model in order to develop and test a shorter version of the seven-factor SUS-TAS fitting in a second-order factor model and acting as an antecedent of residents' support for sustainable tourism development.

Initially, to develop a parsimonious SUS-TAS, systematic validities were assessed for numerous models (i.e. with 44 items, 33 items, 27 items and 21 items). Results of this study confirm the external validity of seven factors of SUS-TAS for 33 items, 27 items and 21 items from data collected among Cape Verde residents. Results provide clear support for the validity of several versions of SUS-TAS in a small, developing island country, demonstrating sufficient evidence of its reliability and validity. Likewise, the current study further creates a final version of SUS-TAS and concludes with a 21-item scale with maximum parsimony. The proposed 21-item SUS-TAS fits the data collected in the Cape Verde islands well without compromising its psychometric properties. As argued by Zhang et al. (2015), a shorter version of SUS-TAS "facilitates the effectiveness of data collection and is thus ordered for its extensive application in large scope tourism practices" (p. 753).

Subsequently, a hierarchical structural factor model was also supported. The seven SUS-TAS$_{21-item}$ factors (the first-order latent variables) are explained by two broader dimensions of PTIs and *ETS* (the second-order latent variables). Likewise, the hypothesis that the three factors of SUS-TAS$_{21-item}$ related to the tourism impacts are loaded into a broader dimension called PTI was confirmed. Similarly, the remaining four SUS-TAS$_{21-item}$ factors loaded onto another broader dimension called ETS. This result contradicts the Zhang et al. (2015) findings that were unable to establish a higher order factor model of the SUS-TAS construct. Our study is the first to demonstrate a hierarchical structure, providing support that SUS-TAS$_{21-item}$ factors belong to a broader dimension and offering some clues for its global interpretation.

However, in line with previous research (i.e. Choi & Sirakaya, 2005; Sirakaya-Turk, 2007; Sirakaya-Turk et al., 2008; Yu et al., 2011; Zhang et al., 2015), the present study provides further evidence that PTI (perceived economic impacts, perceived social cost and perceived environmental sustainability) and ETS (community-centered economy, long-term planning, ensuring visitor satisfaction and maximizing community participation) are important factors that influence residents' support for sustainable tourism development. However, as stated in previous studies (e.g. Gursoy & Rutherford, 2004; Gursoy et al., 2002; Vargas-Sánchez et al., 2015), the relationship between social impacts and support for sustainable tourism development was not significant. A plausible explanation for this finding might be related to the fact that in a developing island country like Cape Verde, residents are eager for economic profitability and they see tourism as an economic vehicle to improve their personal economic situation (Allen, Hafer, Long, & Perdue, 1993; Gursoy & Rutherford, 2004) while underestimating its social cost (Akis et al., 1996; Stylidis & Terzidou, 2014).

Findings from the CFA (first- and second-orders) and SEM show that SUS-TAS is a useful tool to measure residents' attitudes toward sustainable tourism development in small islands and developing countries.

Methodological and theoretical implications

The findings of this study contribute to theoretical and methodological debates on the measurement of residents' attitudes and support for sustainable tourism development. First, appropriate measurement of constructs is of greatest importance (Day & Montgomery 1999) and constitutes a significant field of enquiry (Lee & Hooley, 2005). However, similar to other areas of research, a plethora of studies have been conducted that develop and validate scales within the tourism literature (i.e. Boley & McGehee, 2014; Choi & Sirakaya, 2005; Hosany & Gilbert, 2010; Kim, Ritchie, & McCormick, 2012; Pan et al., 2017; Woosnam & Norman, 2010). However, little attention has been paid to *scale cross-validation* within this line of tourism research. Exceptions to this are the work involving SUS-TAS scale that was cross-culturally validated (Sirakaya-Turk et al., 2008) and later shortened (Sirakaya-Turk & Gursoy, 2013; Yu et al., 2011; Zhang et al., 2015); the Memorable Tourism Experience Scale, developed by Kim et al. (2012) and cross-culturally validated (Kim & Ritchie, 2014); and recently, the Destination Memorable Scale (Hosany & Gilbert, 2010) was cross-culturally validated in the context of hedonic holiday destinations (Hosany, Prayag, Deesilatham, Caušević, & Odeh, 2015). Validation is important for the development of quality measures (Schmitt & Klimoski, 1991). This study advances the literature by presenting a systematic process to create and validate a shortened version of a well-known scale with the aim of establishing the most parsimonious measure to be used in future tourism studies. Following guidelines concerning scale development and validation, SUS-TAS$_{21\text{-item}}$ was tested using data collected from residents in the Cape Verde islands. The stringent steps to create and validate an abridged version of SUS-TAS offer scholars a useful process for further refinement and cross-validation. Despite recommendations for reducing the length of an existing scale abound in the general literature on methods and scale development (see Coste et al., 1997; Leite et al., 2008; Stanton et al., 2002), studies applying these recommendations for reducing the length of an existing scale are scarce within tourism studies. This paper sheds light on shortening and validating scales which ultimately serve to facilitate the theory development and testing within tourism research. Also, it facilitates the data collection process and allows the inclusion of more questions in the survey without causing the "survey fatigue" of the respondents.

Second, one of the most important theoretical contributions this study makes is that it develops and tests (in the context of developing island destination) a parsimonious version of a scale designed and validated in western societies and mature tourism destinations. This study meaningfully fills the void of a customized measure of residents' attitudes towards sustainable tourism scale targeting highly visited destinations, developing island countries. Most of the previous studies (see Sirakaya-Turk et al., 2008; Yu et al., 2011; Zhang et al., 2015) have cross-validated the SUS-TAS in developed countries and/or mature destinations (USA and Turkey). Yet, those studies, apart from Zhang et al. (2015), only presented the first-order factorial validity of SUS-TAS. However, Zhang et al. (2015) failed to demonstrate the hierarchical structure of SUS-TAS, since some of the correlations between its seven dimensions were not significant. In doing so, we provide a better representation of residents' attitudes towards sustainable tourism through a more robust structural model. We are not claiming that the use of a second-order factor model is suitable in all circumstances. Instead, we argue that when embedded in a more stringent form of validity which previous studies have failed to do, a second-order SUS-TAS model leads to a theoretically robust and more parsimonious structural model (Koufteros, Babbar, & Kaighobadi, 2009). Yet, this study is the first to present the validity of a second-order and parsimonious version of SUS-TAS and achieve its global interpretation. As the inter-correlations among all seven dimensions of SUS-TAS were significant ($p < 0.001$) in this study, it meets the assumption of a hierarchical structure and identifies the existence of a global attitude index that interprets the seven SUS-TAS dimensions. Therefore, we conceptualize SUS-TAS as a second-order

construct reflected in two dimensions: *PTI* and *ETS*. This conceptualization aims at strengthening theoretical understanding of SUS-TAS by outlining its domain of content, detailing its dimensionality and clarifying its connection to theoretically related constructs (notably support for sustainable tourism development) and provides strong evidence for its construct and predictive validity. In doing so, both higher order constructs should be used as predictors in comprehensive models of pro-sustainable tourism behavior. Thus, a higher order SUS-TAS model provides a more parsimonious and interpretable model than a first-order factor model and, therefore, has considerable potential for advancing research on a multidimensional construct like residents' attitudes towards sustainable tourism. In addition, the justification to develop and validate a second-order SUS-TAS model is in line with consistent literature pointing out that "researchers have to conduct analyses at the construct level if the conclusions drawn are about the overall multidimensional construct instead of its dimensions" (Wong, Law, & Huang, 2008, p. 746). In conclusion, the results show that assessing SUS-TAS as a second-order factor model is not only conceptually justified but also empirically supported.

Third, the study assesses the predictive validity of SUS-TAS by examining its relationship with a new criterion variable, residents' support for sustainable tourism development. The predictive validity is assessed for the shortened second-order factor model, given the significant correlation between the two second-order factors of SUS-TAS and residents support for sustainable tourism development. However, the second-order SUS-TAS model explained only 44% of variance in residents' support for sustainable tourism. This means that other potential variables beyond attitudes about sustainable tourism may explain the variability in this relationship, such as community attachment (Nicholas et al., 2009), personal economic benefits from the tourism industry (Ribeiro et al., 2017), residents' empowerment (Boley & McGehee, 2014) and residents' perceived power and knowledge in tourism (Nunkoo, 2015). Future studies should consider the examination of these possible constructs to assess the comparative predictive power of SUS-TAS against others constructs.

Managerial implications

From a practical perspective, the results provide tourism authorities and planners in developing island countries, such as Cape Verde, with important insights for implementing adequate planning policies and strategies in order to achieve long-term sustainable and equitable tourism development. Findings suggest that efforts invested in promoting sustainable tourism development by including residents in the planning process will be rewarded by enhancing tourists' satisfaction and loyalty with the destination (Ribeiro et al., 2017). In this sense, residents can be stimulated and educated according to the principles of sustainable tourism that are proactively promoted by tourism authorities and planners.

The predictive validity of SUS-TAS in an emerging small island destination within the Global South provides tourism authorities, planners and practitioners with better insights to develop better tourism policies and strategic plans that include the residents' voices and their commitment in supporting sustainable tourism initiatives.

Destination authorities can use this shortened version of SUS-TAS and the hierarchical structure to permanently monitor residents' attitudes towards sustainable tourism development since residents' attitudes change over time (Gursoy & Rutherford, 2004). Yet, it can be part of a regular residents' attitudes survey to monitor residents' perceptions of the current status of tourism development and ETS status. The validity of the higher order factor model clearly allows authorities and planners to measure and monitor residents' perceptions versus expectations regarding tourism sustainable development in an emerging destination where residents are eager for tourism economic profitability (Ribeiro et al., 2017). These insights can help planners and policy-makers understand the impacts caused by the tourism sector and understand whether residents will support or oppose sustainable tourism development initiatives. For authorities to better manage the destination and pursue a sustainable and equitable tourism development, they must educate the host community in order to understand the importance of tourism, not only in terms of job creation and personal or community

economic gain, but also environmental preservation and long-term sustainability in fragile destinations like small island developing countries.

Limitations and directions for further research

As with other studies, some limitations exist that should be considered when interpreting results. First of all, data were collected on the islands of Boa Vista and Sal where the main tourism product is "sun and sea", mostly offered under the all-inclusive system. Consequently, the findings limit the generalizability of these results to other islands in the country with different tourism products. Second, the length of the questionnaire was long that it impeded the inclusion of other variables in the model. In addition, this is a baseline study which could be useful for future comparisons with studies in similar destinations like Cape Verde. In this sense, the shortening process of SUS-TAS$_{21\text{-item}}$ could also be improved by cross-validating SUS-TAS$_{21\text{-item}}$ using an independent sample, as recommended by Stanton et al. (2002) who proposed recommendations in the scale-reduction process. Despite continued calls for creating abridged versions of lengthy scales (i.e. Burisch, 1997; Gerbing & Anderson, 1988; Kruyen et al., 2013; Mowen & Voss; 2008; Rossiter, 2002), this process should be done cautiously. Some reasons for caution are related with psychometric weakness of shorter versions or one-item measures and the random measurement error that decrease internal consistency of the scale. Also, shorter versions run the risk of not capturing the construct in its entirety, potentially explaining a compromised degree of variance.

As such, future studies should cross-validate this shorter version of SUS-TAS in different settings, contexts and cultures and recommend it as universal instrument that examines the sentiments of local residents within a sustainable tourism strategy. Additionally, future studies should use this shorter version of SUS-TAS as a predictor variable in its relationship with support for sustainable tourism development and include some mediator variables such as residents' quality of life and well-being (Uysal, Sirgy, Woo, & Kim, 2016) and life satisfaction (Bimonte & Faralla, 2016), since it is arguably accepted that sustainability, tourism activities, quality of life and life satisfaction are all interconnected (Uysal et al., 2016). Overall, this study confirms that SUS-TAS in its parsimonious and hierarchical version is a useful, reliable and robust tool for researching residents' attitudes and support for sustainable tourism development.

Disclosure statement

No potential conflict of interest was reported by the authors.

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