Research paper

Modeling residents' perceptions of tourism development: Linear versus non-linear models

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ABSTRACT

This paper aims to investigate the linearity of the relationship between residents' perceptions of and support for the development of tourism. The links between residents' support for the development of tourism and their perceptions have been investigated across a large number of studies, most of which assume a linear path. The current study found that a non-linear algorithm exists between residents' negative perceptions and their support for tourism development, which in some cases could increase the effectiveness of the existing model. This finding marks a significant and unique theoretical contribution of current study. Additionally, by identifying a non-linear pattern of relationships akin to that seen in vivo, these findings can assist local authorities in managing the support of residents and in promoting the sustainability of tourism development.

1. Introduction

Residents' support for and willingness to sustain tourism development activities is conditional upon how they perceive such developments impacting the communities where they reside (Andereck, Valentine, Knopf, & Vogt, 2005; Nicholas, Thapa, & Ko, 2009). Early research on perceptions of residents towards development of tourism suggest the impacts of tourism development are perceived both positively and negatively (Rasoolimanesh, Roldan, Jaafar & Ramayah, 2017). In the event of residents having a positive perceptions of tourism, they will be encouraged to support such developments and to look for opportunities to benefit by offering tourism-related services and products; the perception of negative impacts, however, has the opposite effect of discouraging residents from supporting such developments (Sharpley, 2014). Consequently, most resident-perception research assumes a linear association between the perceptions of residents and their support for the development of tourism (Choi & Sirakaya, 2006; Gursoy, Jurowski, & Uysal, 2002; Jaafar, Noor, & Rasoolimanesh, 2015; Ko & Stewart, 2002; Nicholas et al., 2009). However, studies from the field of tourism pertaining to residents' perceptions suggest the presence of more complex and non-linear relationships between constructs (Allen, Long, Perdue, & Kieselbach, 1988; Bowen & Chen, 2001). These non-linear relationships suggest that how residents behave when they are supportive for tourism development in their communities might be more heterogeneous than

previously thought. The assumption of linear relationships between constructs in a model can lead to the results of a study being misunderstood. Therefore, not only is the actual relationship between variables non-linear; but if the relationship is erroneously assumed to be linear then not only will the true relationship will be underestimated, but the effects of this relationship might register as weak or non-significant.

The objective of the current study is thus to examine the effects of residents' positive and negative perceptions toward tourism development in relation to their support for such development, assuming linear and non-linear relationships in three Malaysian destinations and to compare the results of each set of analysis. Data were collected from residents of Lenggong Valley, Bujang Valley and George Town heritage sites, and subject to analysis by way of partial least squares–structural equation modeling (PLS-SEM), with WarpPLS 5.0 software used to analyse the relationships and to compare the results. WarpPLS 5.0 allows linear and non-linear algorithms to be assessed simultaneously in order to gain a better understanding of the relationships between these constructs.

2. Residents' perceptions toward tourism development

Many studies have been conducted to investigate how residents perceive the impacts of tourism development at various tourism destinations (Kim, Uysal, & Sirgy, 2013; Látková & Vogt, 2012; Nunkoo &

Ramkissoon, 2010, 2011; Nunkoo, Smith, & Ramkissoon, 2013; Rasoolimanesh, Jaafar, Kock, & Ramayah, 2015; Vareiro, Remoaldo, & Cadima Ribeiro, 2013; Wang & Pfister, 2008). These impacts can be perceived positively or negatively (Jaafar et al., 2015). The tourism development can result in an increase in a family's income, increased employment opportunities, improved living standards and can significantly boost a destination's tax revenues from the positive side (Ko & Stewart, 2002; Nunkoo & Ramkissoon, 2011). Similarly, availability of recreational and entertainment facilities often increases in line with the development of tourism (Rasoolimanesh et al., 2015). The growth of indigenous tourism can help to elucidate residents' cultural identity and can contribute to the preservation and revival of their traditional arts, crafts and culture (Jaafar, Rasoolimanesh, & Ismail, 2017; Kim, 2002). On the downside, the development of local tourism can also result in an increase in the cost of living (Rasoolimanesh, Roldán, Jaafar, & Ramayah, 2017), raising the price of property, products and goods (Andereck et al., 2005). Local tourism development can also affect the value systems that underpin many families and the relationships between family members (Jaafar et al., 2017). Previous studies have also identified that the tourism developments can contribute to the overcrowding of local businesses and worsening traffic congestion (Ko & Stewart, 2002), can be associated with an increase in the rate of crime and drug use (Deery, Jago, & Fredline, 2012), and can increase the amount of visible litter and public alcohol consumption (Látková & Vogt, 2012).

Ultimately, predicting residents' support for tourism development is a function of they perceive tourism affecting them and their community (Telfer & Sharpley, 2008). In the event of having positive perceived impacts of tourism development, there is a higher chance of residents to support it. Conversely, should residents perceive an abundance of negative impacts, they risk withdrawing their backing from development of tourism (Kim et al., 2013).

Several studies that have tried to understand whether residents' support for tourism is influenced by their perceptions. These studies have mainly relied upon the Social Exchange Theory (SET) as a theoretical base (Látková & Vogt, 2012; Rasoolimanesh et al., 2015). As per the SET, if residents' perceived tourism development benefits outweigh its costs, they will interact with tourists and be supportive of tourism development (Telfer & Sharpley, 2008). Conversely, should their perception of tourism development's negative impacts offset positive impacts, they risk becoming disenchanted with the idea of tourism development and may refuse to support any such development (Nunkoo & Ramkissoon, 2011).

Previous SET studies have reported that residents' support for tourism development (SUP) is positively impacted by their positive perceptions (PP) (Gursoy et al., 2002; Nunkoo & Ramkissoon, 2010). Notwithstanding, regarding the effect of residents' negative perceptions (NP), previous studies have reported inconsistent findings. Some studies, consistent with SET, have confirmed a negative relationship between negative perceptions of residents about tourism development and their support for it (Rasoolimanesh et al., 2015; Wang & Pfister, 2008), while other studies have identified not significant impacts (Nunkoo & So, 2015).

3. Linear and non-linear relationship

Most studies of residents' attitudes and perceptions assume a linear relationship between variables in the model and have used a range of approaches to statistically examine these relationships (Gursoy et al., 2002; Jaafar et al., 2015). Multiple regression analysis (Látková & Vogt, 2012), covariance-based SEM (Gursoy et al., 2002; Nicholas et al., 2009) and PLS-SEM (Jaafar et al., 2015; Rasoolimanesh et al., 2015) have been used to assess linear relationships between residents' perceptions and other variables, such as community participation (Jaafar et al., 2017), support for tourism development (Gursoy et al., 2002; Nicholas et al., 2009) and quality of life (Ko & Stewart, 2002).

However, several studies have suggested the possibility of non-linear relationships between the variables mediating residents' perceptions (Allen et al., 1988; Gursoy et al., 2002; Nepal, 2008). For instance, Allen et al. (1988) found a negative quadratic relationship between tourism development and residents' perceptions toward community services and opportunities. This would suggest that increasing the number of tourists in the community in the early stages of tourism development can lead to improved community services and economic opportunities for residents. However, as the number of tourists continues to rise, the local community will eventually grow to become concerned about availability of services and lack of opportunities in their community, as well as damage to the surrounding environment. Therefore, according to Allen et al. (1988), the relationship between tourism development and residents' perceptions of the impacts of tourism follows a non-linear or quadratic relationship. Moreover, Gursoy, Chi, Ai, and Chen (2011) and Nepal (2008) propose that support for tourism among community members might be heterogeneous, based on their perceptions and attitudes toward the impacts of tourism and the likelihood of non-linear and quadratic relationships.

Consequently, the possibility of non-linearity should be examined. If the relationship between variables is assumed to be linear, while in all actuality these relationships are non-linear, the true nature of these relationships will be underestimated and the effect size may be weak or non-significant (Osborne & Waters, 2002). Several approaches to the detection of non-linearity have suggested in the literature, including: (a) analysis of previous studies, (b) examination of residual plots, and (c) analysing for both linear and non-linear relationships and comparing the results and relationship plots (Berry & Feldman, 1985; Cohen & Cohen, 1983; Osborne & Waters, 2002; Pedhazur & Kerlinger, 1997). The current study focuses on the third method of analysis; consequently, this paper analyzes the relationship between residents' positive and negative perceptions of tourism development and their level of support for such development using linear and non-linear functions in three case studies. The results and models are then compared.

4. Research method

4.1. Instrument and data collection

Data pertaining to residents' positive and negative perceptions, as well as their level of support for tourism development, were collected using a self-administered questionnaire. Items for the questionnaire were taken from the literature (Látková & Vogt, 2012; Wang & Pfister, 2008). Respondents answered these questions on a five-point Likert scale where 1 was anchored at *strongly disagree* and 5 was anchored at *strongly agree*. Systematic sampling was used to identify potential respondents from the residents of three destinations in Malaysia, i.e. George Town, Lenggong and Bujang Valley. A number of students from the Universiti Sains Malaysia were hired to distribute and collect the questionnaires. Data collection was performed according to the following schedule: January–February 2015 (George Town), May 2014 (Lenggong) and March–June 2014 (Bujang). The surveyors approached residents' houses systematically, asking whether the occupant was a resident and, if so, if they were willing to complete the questionnaires. If a resident declined to participate, the adjacent house was selected. In total, 410, 221 and 141 questionnaires were returned from the respondents residing in George Town, Lenggong and Bujang, respectively. Different sample sizes reflect the size and the density of the population in each location. The George Town historical site contains 2500 households and 9425 residents; the population of villages near Lenggong totalled 3826, living among 775 households; and in Bujang, approximately 1400 villagers live within the vicinity of the archaeological site, spread over 320 households.

Having sample sizes of 141, 221 and 410 for three cases was considered suitable for performing PLS based SEM analysis, which requires a cut-off sample of 100 (Reinartz, Haenlein, & Henseler, 2009). In