The significance of environmental values for destination competitiveness and sustainable tourism strategy making: Insights from Australia's Great Barrier Reef World Heritage Area

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Abstract

Sustainable destinations must deliver products that perform better than their competitors and at the same time protect key environmental drawcards. This research explores the environmental – economic interface of a major destination, both as a case study in how to approach this complex relationship, and as a contribution to the methodology of tackling the need for understanding competitive pressures as part of sustainable tourism strategy creation. Using the Great Barrier Reef World Heritage Area (GBRWHA) as an example, the paper assesses 21 key environmental values, including indigenous culture, against market-based factors, in terms of their importance for visitors as regional drawcards, satisfaction with them and the way in which changes in them might affect trip numbers and duration across different regions. While the natural values of the GBRWHA are found to be the most important drawcards, satisfaction scores were significantly lower than importance scores for a number of these values. Visitors responded more negatively to the prospect of environmental degradation than to the prospect of a 20% increase in local prices: the detailed impact depends, however, on location and visitor mix. Clear ocean, healthy coral reefs, healthy reef fish and lack of rubbish were the top four most important values.

Keywords: Great Barrier Reef World Heritage Area; destination competitiveness; environmental values; visitor perceptions; importance, satisfaction

Introduction

Tourism is renowned as a resilient industry, able to bounce back despite economic challenges and natural crises. Such resilience is manifested in the billions of arrivals globally. According to the latest figures, international arrivals peaked at 1,087 million in 2013 – 52 million more than in the previous year (UNWTO, 2014). Driving this growth are many factors, but the core appeal for travel remains natural and man-made attractions, acting as pull factors in tourists' destination choice (Malhotra, 2012). Australia, particularly Northern Australia, is one example where nature-based experiences 'dominate' the tourism market (Chandler et al., 2014). Amongst several well-known natural attractions are the Great Barrier Reef and the Wet Tropics World Heritage Areas (GBRWHA and WTWHA) – the only two world heritage areas to exist side-by-side. The GBRWHA, in particular, is a major drawcard for the region, attracting over 80% of the Northern overnight visitors (Deloitte Access Economics, 2013). Inevitably, this Australian icon supports a successful tourism industry injecting AUS$5 billion into the economy and generating around 64,000 fulltime equivalent jobs (Deloitte Access Economics, 2013). Commercial tourism activities on the GBR range from day trips to live-aboard to longer cruises (Moscardo et al., 2003). Such is the importance of the industry that local authorities continue to seek ways of further promoting tourism in the region. The recent completion of an AUS$85 million state-of-the-art cruise ship terminal in Townsville and an upgrade of the port's berthing capabilities are clear examples of the desire to expand visitation to the area (Sparkes, 2014). The need to increase tourism numbers is also supported by the proposal for a AUS $4.2 billion resort and casino complex near Cairns (Deloitte Australia, 2014).

Given the significant economic contributions of tourism, it is not surprising to find the growth of the industry at the forefront of development policy agendas of governments worldwide. However, to ensure a viable tourism industry, destinations must maintain or improve their natural, physical and social assets (Chandler et al., 2014). Simplistically, it is crucial that a destination's competitiveness is retained. This is especially important, given observed stagnation in several destinations, including the GBRWHA (Deloitte Access Economics, 2013).[1] A destination must not only ensure its overall attractiveness, but the integrity of the experiences it delivers to tourists must equal or surpass that of alternative destinations open to potential visitors (Dwyer and Kim, 2003).

Despite competitiveness being both a *relative* and *multi-dimensional* concept (Spence and Hazard, 1988), few studies have considered the *relative* importance of the different dimensions of competitiveness. For example, how important are natural resources compared to more development? How important is having more tourists compared to price competitiveness? In the context of natural resources, how important is, for example, ocean clarity, compared to coral reefs?

Are visitors satisfied with these attributes? How would changes in these attributes affect the decision to visit? As noted by Dwyer and Kim (2003), questions like these cannot be answered without a specific destination being studied and without exploring specific visitor market segments to that destination. The more informed policy makers become about the interrelationships between visitor preferences and destination attributes, the better decision-making will be for the benefit of the tourism industry. Accordingly, this paper considers the different ways of identifying key success factors in determining destination competitiveness,[2] using the GBRWHA as a case study.

More specifically, this paper examines visitors' perceptions of the *relative* importance of a range of key ecosystem goods and services (hereafter 'values') connected with the GBRWHA, and the likely consequences of deterioration in some of those values on the overall decision to visit the area. Driving these investigations are the notions that the GBRWHA has 'value' far above and beyond that which is reflected in the marketplace, and that there are likely to be many different ways in which people relate to, or interact with and benefit from the GBRWHA. Data received from 2743 visitors provided answers to the four key research questions developed in this study:

1) *a. What values of the GBRWHA did tourists find the most important?*
   b. Which values were important to whom?

Visitors are seeking inspiring experiences which connects them in a personal way with special places, people and cultures. The ability of the GBRWHA to truly engage with visitors is crucial for its competitiveness. Information about which values are most important to visitors when deciding to choose the GBRWHA as their destination is thus necessary. Fundamentally, why does a person visit? This information will help explain the goals, the loves and the needs of the visitor (Bushell et al., 2007), thereby providing tourism marketers and operators with better information about their customers. Since different travellers have different priorities, knowledge of which values are important to whom will facilitate a suitable marketing strategy and fulfil visitors' expectations.

Admittedly, this sort of information is not necessarily lacking. Indeed, there is a plethora of studies which have examined the motivations of visitors to the GBRWHA (Coghlan, 2012, Kragt et al., 2009, Coghlan and Prideaux, 2008, 2009). However, the point of difference in this paper is that it provides information on the *relative* importance of a broader range of values (e.g. recreation AND production AND bequest)[3] – and combines information about the importance of these drawcards with other types of information, as described below.

2) *a. Are tourists satisfied with these values while on their trip?*
   b. Who were the most satisfied with which values?

While information about important values is essential, it is equally useful to identify which values satisfy the visitor who visits the GBRWHA. Hence, the second piece of information required in formulating an appropriate strategy to attract more tourists, is visitor satisfaction. Satisfaction or dissatisfaction with one of the values will lead to satisfaction or dissatisfaction with the overall destination (Pizam et al., 1978). Broadly, satisfaction is defined as *"an overall customer attitude towards a service provider, or an emotional reaction between what customers anticipate and what they receive, regarding the fulfilment of some needs, goals or desire"* (Hansemark and Albinson, 2004, Zineldin, 2006). In the context of the GBRWHA, as a protected area, satisfaction scores are an important component in assessing its success, or failure, to deliver a high quality visitor experience (Coghlan, 2012). If travellers to the GBRWHA are satisfied with the experience, then they are more likely to extend their stay, visit again or make recommendations to friends and family (Kozak, 2003, Vetitnev et al., 2013). In the case of the latter, Angelova and Zekiri (2011) note that endorsement of a product (or sharing of information about the experience) to others is in the order of five or six people for satisfied customers. However, dissatisfied customers are more likely to tell another 10 people of their experience. Hence, without visitors, without satisfied visitors in particular, tourism in the GBRWHA may cease to exist.

3) *Are visitors satisfied with the things that are most important to them?*

Looking at importance and satisfaction separately, although significant in their own right, does not allow for a more holistic examination of values since important questions remain unanswered (e.g. Is the effort given to different values mirroring the importance attached to each?). By simultaneously looking at both, policy makers and tourism marketers can identify which factors require the most attention and rectify them accordingly - the aim being to improve those values deemed highly important but which visitors have expressed dissatisfaction with, while also maintaining or enhancing core strengths (i.e. those values which are important and which visitors are satisfied with) (Esparon et al., 2014, Angelova and Zekiri, 2011).

4) *a. What changes would impact most on future visitations to the GBRWHA?*
   b. Which visitors would the region lose if there were deteriorations in these values?
   c. Which region would lose most visitors?

The relative importance of key GBRWHA-based values can also be understood by examining how they might be impacted by a particular change or management decision (e.g. reductions in ocean water clarity, caused by increased sedimentation and nutrient loads, or increases in tourism),

and their likely implications on visitor's decision to come to the region. That is, identifying values that exert the strongest influence.

As noted earlier, there is a strong push towards investing in facilities that support greater tourism numbers. Driving such investments is the rapidly expanding Asia market. China, in particular, is the fastest growing market in Australia, with inbound visitors increasing by more than 14% between 2011/12 and 2012/13 and generating the largest spending per visitor (Tourism Research Australia, 2014). Japan is another prominent Asian source market (Tourism Research Australia, 2012). Since most Chinese and Japanese visitors to northern Australia go to the Cairns/Port Douglas area (Chandler et al., 2014) and given the latest AUS$4.2 billion investment proposal for a resort and casino complex there, it would be ideal to better understand what their salient values are and the potential consequences of changes on these visitor segments and others. This information, including more knowledge of impending repercussions across regions, is thus necessary when considering strategies to maintain GBR's competitiveness.

In sum, a destination must ensure that it delivers goods and services that perform better than its competitors on those aspects of the tourism experience deemed to be important by tourists. The aim of this study, therefore, is to examine different ways of identifying key success factors in determining destination competitiveness, using the GBRWHA as a case study. Cognisant that competitiveness is multi-faceted, a series of indicators are used to identify the strengths and weaknesses of the GBRWHA as a nature-based destination. This is done by looking at the importance of, and satisfaction with, various values of the GBRWHA and the potential ramifications of change to those values on future visitations across visitor segments and regions.

What has this study to do with sustainable tourism? Typically, commentators on sustainable tourism concentrate on the socio-cultural and environmental issues of the "triple bottom line". The economic issues, and the issue of being both sustainable *and* competitive, are, however, both essential parts of the sustainable destination planning equation (see Pulido-Fernández et al., 2015; Ritchie and Crouch, 2000). This research explores the environmental – economic interface of a major destination, both as a case study in how to approach this complex relationship, and as a contribution to the methodology of tackling the need for understanding competitive pressures as part of sustainable tourism strategy creation (see Wray, 2011; Moyle et al., 2014). Specific details are presented next.

Materials and methods

Case study area

The GBRWHA, located in the Coral Sea, off the coast of Queensland, Australia is one of the richest[4] and most diverse of ecosystems worldwide, having satisfied all four natural criteria for World Heritage listing: natural beauty, earth's history, ecological processes and biological diversity (UNESCO, 2013). Such recognition obliges the Australian Government to ensure its identification, protection, conservation, presentation, and transmission to future generations (Stoeckl et al., 2011). Over 2300km long, it includes reefs and more than 900 islands and cays which support over 200 species of birds, several beaches, estuaries and mangroves (Figure 1).

The GBRWHA is also culturally significant to traditional owners with 70 Aboriginal and Torres Strait Islander clan groups having ongoing traditional connections to their land and sea country for traditional resources and customary practices. Such is the importance of these heritage values, that the GBR has been included on Australia's *National Heritage Listing* (GBRMPA, 2011).

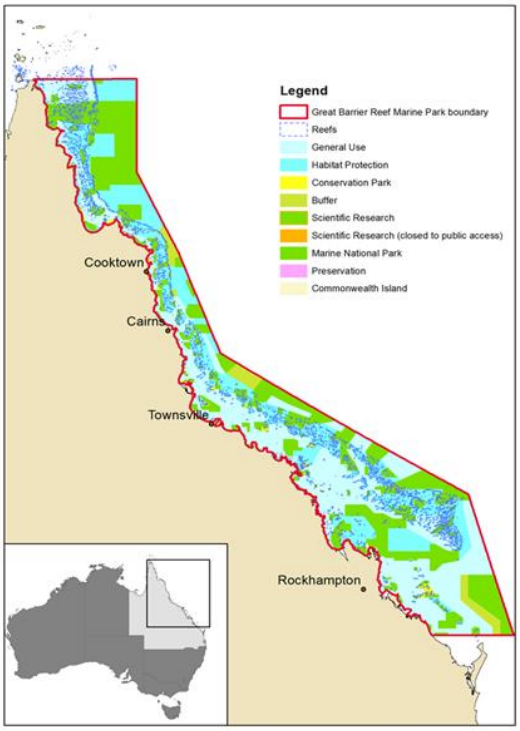

Figure 1. The Great Barrier Reef World Heritage Area (GBRWHA)
(Map produced by Vanessa Adams, Charles Darwin University)

Historically, the GBRWHA holds a good record, being held up as one of the healthiest and best managed reef systems worldwide (GBRMPA, 2009, Coghlan and Prideaux, 2009, Tourism and Events Queensland, 2014). However, the state of the reef is worsening. Key threats have been attributed to the deterioration of the reef, namely: climate change, pollution from agricultural run-off and development, including ports, mining and tourism. There is much documented evidence linking observed declines in coral cover and water quality, with increases in sediment, nitrogen and phosphorus loads in the GBR lagoon (Brodie et al., 2012, Fabricius et al., 2013). Unless corrective

measures are undertaken, the GBR will likely be added onto the *List of World Heritage in Danger* (UNESCO, 2012).

Questionnaire design

Determining which values and management issues to assess

As mentioned earlier, there are many types of environmental values, and different people are likely to value the environment in different ways. In this context, an understanding of Lancaster's *Theory of Characteristics* seems relevant if wanting to improve our understanding of the demand for tourism in the GBRWHA. Lancaster (1966), postulated that a product constitutes many properties or characteristics and it is the perceived utility of those characteristics that drives consumer choice, not the goods *per se.* Demand for and/or satisfaction with visiting the GBRWHA (as a tourism product) will therefore depend upon its attributes and perceived values. Accordingly, the first task of this research was to determine which key values and management issues should be assessed. This was done via extensive consultations with key stakeholders.

Three workshops were organised, to gain the perspectives of different stakeholder groups including those in: (1) management; (2) fisheries and state government departments; and (3) the tourism industry. Stakeholders identified the important values of the GBRWHA, drivers of change and key management decisions for consideration in the context in which they were operating. These workshops were thus aimed to ensure the relevance of the data collected to key stakeholders. Participants were asked to record and priority rank these values. The resulting list was further tested for suitability and relevance via a cognitive mapping exercise with members of the public at various locations. Recognising that respondents to our survey were unlikely to be willing to assess excessively long lists of values, the cognitive mapping exercise allowed us to identify values that could be presented collectively (e.g. swimming and snorkelling; fishing and boating), hence, shortening the long list of values generated from the workshops. Table 1 depicts the final list of GBRWHA-based values (21 in total) and key management challenges considered in the study. These were used to assess (1) importance; (2) satisfaction; and (3) implications of 'change' on tourists' decision to come to the region. The questionnaire was translated into Chinese and Japanese, which collectively, covered an estimated 90% of the international tourism market in the Far North (Tourism Research Australia, 2012). A copy of the questionnaire can be found as Supplemental Data 1 on the web based version of this paper.

Table 1. GBRWHA-based values and key management challenges
(in brackets, abbreviations used in this paper)

Selected values
Visiting friends and/or relatives (Friends) Attending to business, going to a meeting and/or conference (Business) Visiting a place which is close to where I live (Close) Finding a place where the price matched my budget (Budget) Having good quality accommodation, shops and restaurants (Accommodation)
Being able to: • eat fresh local seafood (Seafood) • go fishing, spear-fishing or crabbing (Fishing) • spend time on the beach, go swimming, diving, etc (Beach/Swimming) • go boating, sailing or jet-skiing (Boating)
Enjoying • Indigenous cultural experiences (Indigenous) • Sunshine and warmth (Sunshine) • "Bragging rights" – being able to say "I have been to the GBR" (Bragging)
Seeing/Experiencing: • undeveloped and uncrowded beaches and islands (Undeveloped) • beaches and islands without visible rubbish (No rubbish) • healthy coral reefs (Coral reefs) • healthy reef fish (Reef fish) • iconic marine species: whales, dugongs, turtles, etc (Iconic species) • clear ocean water-with good underwater visibility (Clean ocean) • the Wet Tropics World Heritage rainforest (Wet tropics) • iconic land species: kangaroos, cassowaries, etc (Iconic land species) • mangroves and wetlands (Mangroves)
Selected management challenges
Twice as much rubbish on the beaches and islands (No rubbish) Half as much chance of catching fish (Fishing) Half as many fish and less variety to look at (Reef fish) Half as much live coral (Coral reefs) Twice as many tourists (Tourists) Ocean changed from clear to murky (Clean ocean) Twice as many oil spills, groundings and waste spills (oil spills, groundings and waste spills) *Local prices rose by 20% compared to the rest of Australia (Increase in prices) **

* Used as a benchmark for comparison

For each of the selected values in Table 1, respondents were asked how important each was to their overall decision to visit the region (measured on a 5-point Likert scale where 2= Very important and -2= Very unimportant). Similarly, for each of the selected values in Table 1, respondents were asked how satisfied they were with each on this trip (measured on a 5-point Likert scale where 2 = Very satisfied and -2= Very unsatisfied).

As regards the selected management challenges, tourists were asked about their response to eight potential (hypothetical) 'changes' related to those challenges. Specifically, respondents were asked how the change would have affected their overall decision to visit the region. Here, responses were elicited on a scale of: (1) I may have stayed longer; (0) this would not have affected my decision at all; would have visited but reduced the length of my stay by about (-1) 25%, (-2) 50%, (-3) 75%; and (-4) I would not have come here at all.

Sampling and data collection

To achieve a temporally and geographically stratified sample of visitors, respondents were approached over a one year period (June 2012-2013) via two avenues: (1) by being intercepted at key locations in the region (airports, ferry terminals, caravan parks, beaches and lagoons), and (2) through tourism operators who agreed to distribute the questionnaires. Approach (2) allowed the collection of data from those not frequenting key locations and as such, the sample contains responses from different market segments (e.g. international and domestic fly-in fly-out visitors, backpackers, drive visitors, etc.). Geographically, the focus was on visitors to the Cairns/Cooktown and Townsville/Whitsunday Local Government Areas of the GBR catchment, since these regions receive c. 90% of visitors to the Reef (GBRMPA, 2013). In our sample these regions yielded around 50% and 40% of all respondents, respectively, thereby matching visitation patterns reported by the Great Barrier Reef Marine Park Authority (GBRMPA, 2013).

A total of 2743 visitors participated in the study, of these, 225 and 243 were from China and Japan, respectively. Overall, the sample can be described as predominantly international (55%), female (55%), young (53% being 20-40 years old), university educated (52%), travelling as a couple (36%), and first time visitors to the region and to the Reef (57%).

Data analysis

In the first instance, we visually inspected charts showing the distribution of responses to the importance, satisfaction, and management challenges questions. Responses to the 'importance' and 'satisfaction' questions were then compared, using the (non-parametric) Wilcoxon signed-rank test to highlight statistically significant differences. When doing so, we ensured that only those who responded to both the importance and satisfaction questions were considered for comparison. This allows for an accurate assessment of satisfaction with values (note that some respondents were approached early during their stay, hence had not yet been to the reef and were unable to respond to the satisfaction questions). Both ordinary least squares regression (OLS) and seemingly unrelated regression (SUR) were employed to examine the socio-economic determinants of (a) the importance

scores assigned to each value; and (b) respondent stated reaction (in terms of altered trip duration) to the hypothetical changes.

More specifically, responses to each question (about importance and satisfaction) was regressed against several socio-demographic variables[5] using SUR models, advisable for use when error terms between equations are highly correlated (Zeebari et al., 2012). Given the high correlations, we also performed Categorical Principal Component Analysis (CATPCA), a popular data reduction technique, to identify which values and which 'changes' grouped together. These factor scores were then regressed against the socio-demographic variables using OLS. Both the SUR and OLS models produced similar results, in terms of resulting determinants, and as such, we are confident in the robustness of these findings. Given similarity of results, only results of the OLS regression using CATPCA are presented in the main body of the text and those of SUR in Supplemental Data 2 (individual values) on the web based version of this paper.

Finally, the data set was divided into three groups based on geographic location, corresponding to the (1) Cairns/Port Douglas; (2) Townsville/Whitsunday; and (3) Mackay/Rockhampton management regions. For each region, estimates of current mean length of stay and the mean stated reduction in trip duration following each hypothetical 'change' were used to generate estimates of the relative regional economic impact such changes could potentially make. The (non-parametric) Kruskal-Wallis test and *post-hoc* procedures were used to identify statistically significant differences across these regions.

Results

Importance of and satisfaction with the GBRWHA-based values

The values that tourists rated as being most important when deciding to come to the area were those relating to the environment (Figure 2). Clarity of water (Clear ocean) was identified as the most important value. Healthy coral reefs, healthy reef fish and lack of rubbish were also very important. The clear message here, is that environmental factors are more important 'draw-cards' to the region than market-based factors (e.g. availability of good quality accommodation, and local prices – here termed budget).

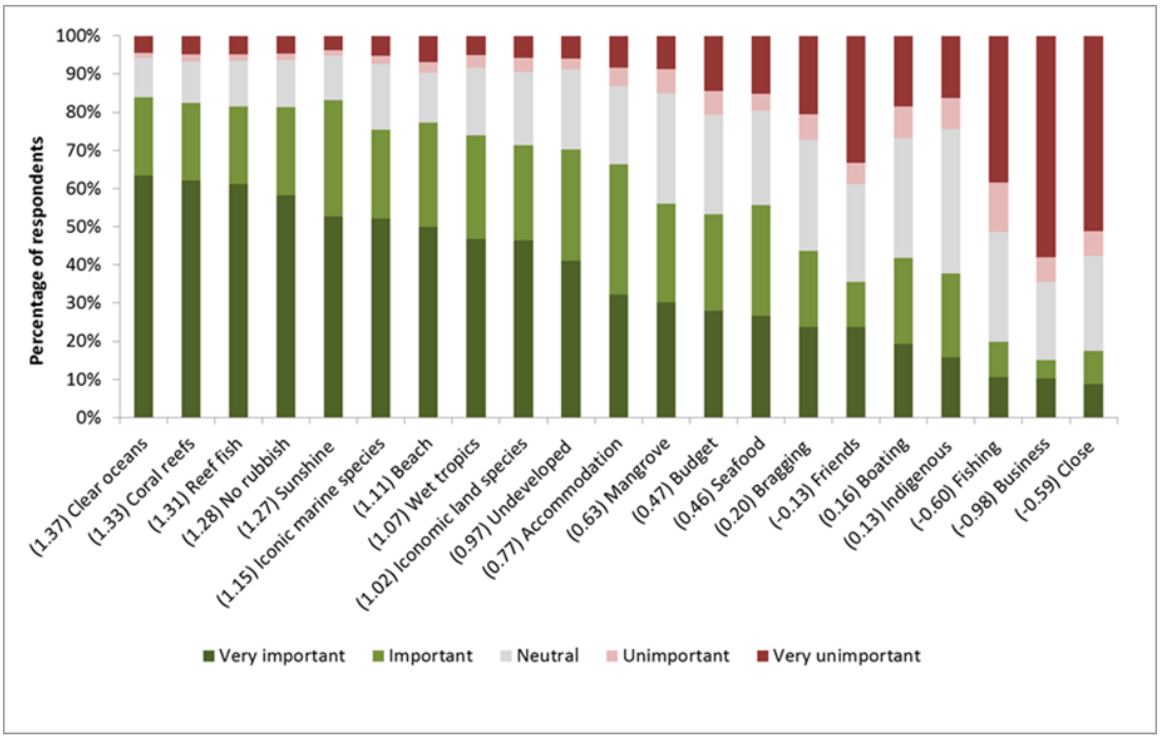

Figure 2. Importance of various GBRWHA-based values as a reason for coming to the region
Note: Mean shown in brackets, scale from -2 to 2

When asked how satisfied they were with these values, it appears that tourists were generally satisfied with the majority of environmental factors (most received more than 1 point, where 1= satisfied, however, satisfaction scores were lower than importance scores) (Figure 3). For most environmental values, the Wilcoxon signed rank test revealed that differences between importance and satisfaction were statistically significant, with importance exceeding satisfaction. That is, satisfactions with these values were perceived as significantly less compared to the level of importance ascribed to them.

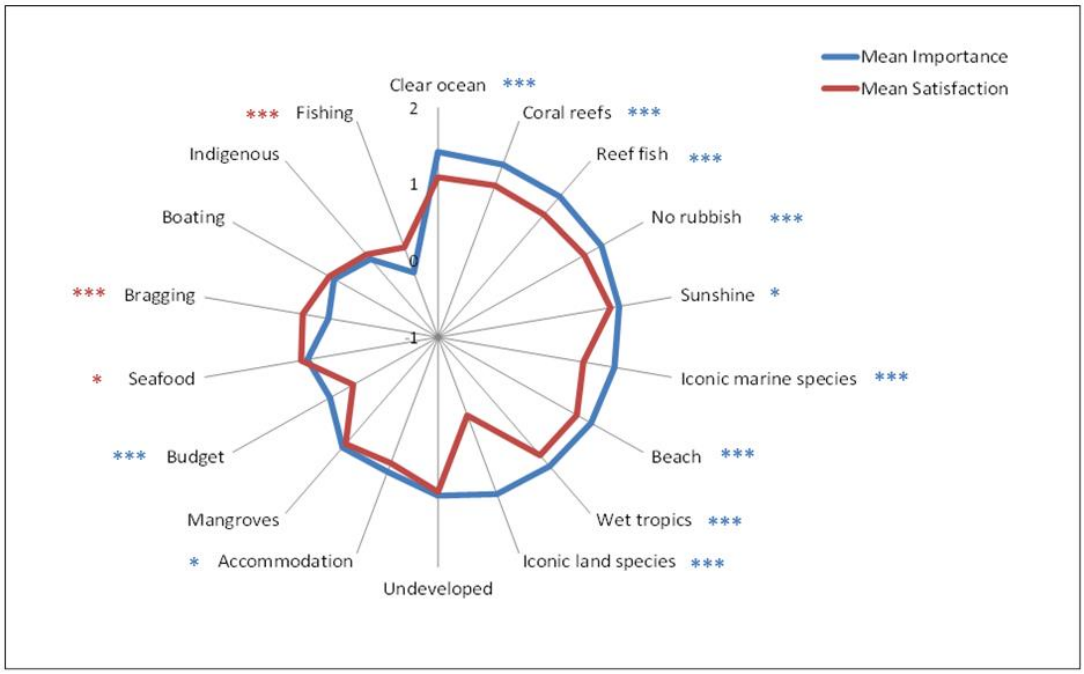

Figure 3. Mean importance and satisfaction scores compared

Note: Single and triple asterisks (∗) denote significance of the difference between the distributions relating to importance and satisfaction at 10% level and 1% level respectively. Blue asterisk depicts significantly higher importance than satisfaction. Red asterisk depicts significantly higher satisfaction than importance.

The CATPCA that was conducted on 'importance' scores yielded three groups of factors from the original 21 attributes. There was a clear distinction between those who came for business in one group, those who came for nature, Indigenous culture, fresh seafood and recreation, in another group; and those who preferred to be somewhere close to suit their budget, to see friends and go fishing (Table 2). Interestingly, all environmental values fell in the same group.

Table 2. Factors created using CATPCA on importance scores

Nature, culture, seafood & recreation	Business	Socialising & value for money
Coral reefs (0.966)	Business (2.290)	Friends (0.708)
Reef fish (0.960)		ccommodation (0.607)
Clear ocean (0.919)		Budget (0.535)
No rubbish (0.852)		Close (0.458)
Iconic marine species (0.837)		Fishing (0.399)
Wet Tropics (0.803)		
Iconic land species (0.757)		
Undeveloped (0.719)		
Mangroves (0.657)		
Beach (0.593)		
Sunshine(0.529)		
Seafood (0.508)		
Bragging (0.401)		
Boating (0.362)		
Indigenous (0.357)		

Factor loadings in brackets

Table 3. Characteristics of respondents determining importance scores for groups of values tested (OLS)

Variable	Nature, culture, seafood and recreation	Business	Socialising & value for money
Male	(-)**	(+)***	(-)**
Single			
Age			(+)**
Indigenous			
Education	(-)***		(-)***
Household Income		(+)*	
Household size			
Visitor QLD		(+)***	
Visitor from the rest of Australia		(+)**	
China			
Japan			
Traveling as a couple		(-)***	(+)***
Traveling as a family with children		(-)***	(+)***
Traveling with friends		(-)***	(+)***
Traveling with a tour group		(-)***	
Visitor to Mackay/Rockhampton area			(-)***
Visitor to Townsville/Whitsunday area		(+)***	(-)***

A plus sign (+) indicates that the variable was found to have a positive and statistically significant relationship with the score assigned to the corresponding value; a negative sign (-) indicates the relationship was negative and statistically significant.*** significant at 1% level ** significant at 5% level * significant at 10% level.

Regressing these factor scores against various socio-demographic variables revealed that different people do, as expected, consider different things to be important (Table 3). Compared to females, males placed lower importance on nature, culture, seafood and recreation, and on socialising and value for money as a reason to come to the region. Coming to do business was a higher priority for males than females. Overall, socio-demographic variables were found to be weaker determinants of importance for nature and its associated values, compared to the other two groups of values.

Reaction to hypothetical change

Responses to questions about the way in which various 'changes' would have affected people's decision to visit the region reinforce the message from above: environmental values are important to overall decisions, and some types of environmental degradation would have a stronger adverse impact on tourists' decision to come to the GBRWHA than the prospect of a 20% increase in local prices. The worst thing that could happen is having oil spills, groundings and waste spills – with 48% of respondents saying that they would not come at all in this situation. The next biggest 'turn-off' was water clarity. Should the ocean become murky, about 45% of visitors would consider reducing their stay. About 35% would not have come at all (Figure 4).

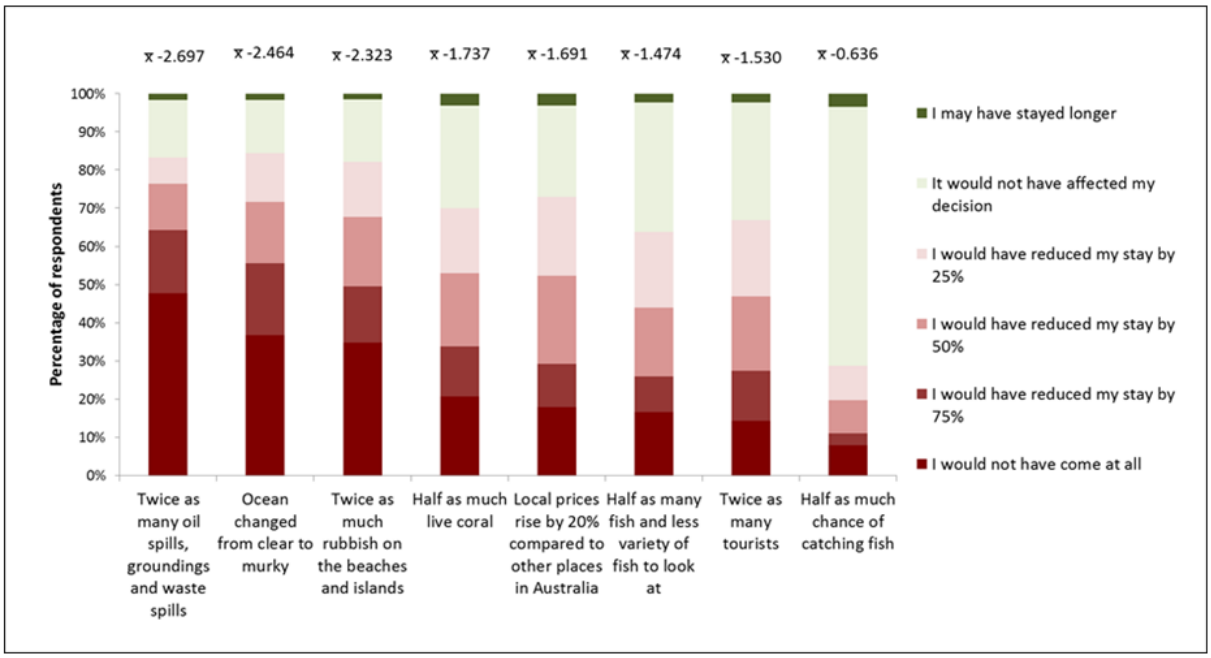

Figure 4. Stated response to hypothetical changes in the GBRWHA

Note: Mean is calculated on the following scale: =1 if might have stayed longer; =0 if almost no impact; =-1 if still visited but reduced the length of stay by 25%; =-2 if still visited but reduced the length of stay by 50%; =-3 if still visited but reduced the length of stay by 75%; =-4 if would not come at all.

Table 4. Factors created using CATPCA on 'change' scores

Environment & tourism	Budget	Fishing
Coral reefs (0.847)	Increase in prices (1.197)	Fishing (0.736)
Clean ocean (0.836)		
Reef fish (0.809)		
No rubbish (0.785)		
Oil spills, groundings & waste spills (0.748)		
Tourist (0.686)		

The CATPCA that was conducted on answers to the hypothetical change questions also revealed that responses relating to environmental factors grouped together; fishing and prices were different (Table 4). Regressing these factor scores against socio-demographic variables likewise revealed that different types of visitors are likely to respond differently to various 'changes' (Table 5). Those who were Indigenous, highly educated, from China and Japan, were more likely to reduce their stay (or not come at all) if there were environmental deteriorations and/or if there were more tourists. As might have been expected, if such degradations were to occur, they would less likely impact on the business visitors' decision to come to the area. Those who were single were less sensitive to higher prices than those who were in a relationship. Similarly, visitors to the Townsville/Whitsunday region appeared to be less sensitive to price changes than those in other regions. If there was less chance of catching fish, visitors to the Mackay/Rockhampton area were more likely to reduce their stay (or not have come at all).

Table 5. Characteristics of respondents determining reaction to change (OLS)

Variable	Environment & tourism	Budget	Fishing
Male			
Single		(-)**	
Age		(-)*	(-)**
Indigenous	(+)*		
Education	(+)**		
Household Income			
Household size			
Visitor QLD			
Visitor from the rest of Australia			
China	(+)***		
Japan	(+)*		
Traveling as a couple			
Traveling as a family with children			(-)**
Traveling with friends			
Traveling with a tour group			
Business Visitor	(-)***		
Visitor to Mackay/Rockhampton area			(+)**
Visitor to Townsville/Whitsunday area		(-)*	

A plus sign (+) indicates that the variable was found to have a positive and statistically significant relationship with the score assigned to the corresponding value; a negative sign (-) indicates the relationship was negative and statistically significant. *** significant at 1% level ** significant at 5% level * significant at 10% level.

Table 6 provides more detailed information about the likely impact of different hypothetical 'changes' to the three core regions of the GBR catchment. It gives mean length of stay in each region, as well as details of the (mean) percentage reduction in length of stay that would occur in response to the different hypothetical changes. Overall, visitors to the northern regions responded more negatively to questions about environmental degradation and more tourists than those in the south. That said, southern visitors tend to have longer visits. So the average days lost per visit is greater in the south, than in the north. The magnitude of these responses might be impacted by the hypothetical nature of the question, resulting in an over-statement of response, however, this occurrence would have no impact on relative comparison between regions.

The non-parametric tests used indicate that differences in the potential percentage reduction in length of stay are statistically significant across the three regions for a number of hypothetical changes, such as clean ocean, no rubbish, reef fish, coral reefs, fishing, tourists and oil spills, groundings and waste.[6] Visitors to the Cairns/Port Douglas region were found to be more sensitive to environmental degradation than those in the Mackay/Rockhampton region, in particular for changes in ocean clarity, rubbish levels, reef fish, coral reefs, and oil spills, groundings and waste. However, visitors to the Mackay/Rockhampton region were more sensitive to the prospect of catching fewer fish than those in the north (Table 6).

Table 6. Mean length of stay and potential % reduction in days for each respective change across regions

	Cairns/Port Douglas	Townsville/Whitsunday	Mackay/Rockhampton
	Current mean length of stay =11.2	Current mean length of stay =13.4	Current mean length of stay =27.7
	Potential % loss (mean)	Potential % loss (mean)	Potential % loss (mean)
Clean ocean	0.96	0.58	0.49
Increase in prices	0.46	0.42	0.44
No rubbish	0.64	0.55	0.49
Fishing	0.16	0.16	0.29
Reef fish	0.43	0.35	0.32
Coral reefs	0.51	0.41	0.35
Tourists	0.42	0.37	0.36
Oil spills, groundings & waste spills	0.75	0.65	0.51

Discussion

In highly competitive industries like tourism, delivering high quality service is key for achieving a sustainable competitive advantage and at the same time, enhancing destination competitiveness. For the GBRWHA, the challenges and opportunities this represents have never been so great: for many years, it has been advertised as a must-see destination, but its condition has recently been the subject of much concern, both locally and globally. Therefore, using the GBRWHA as a case study, this research sought to develop an insight into the different ways of identifying key success factors determining destination competitiveness. Information was sought on the following: which values of the GBRWHA visitors perceive to be important; to whom are these values important; how satisfied visitors are with these values; who are the most satisfied; what changes would impact the most on future visitations; who would the GBRWHA lose following certain types of deteriorations; and where would the most impact be felt. A broad range of values were considered, using the same methodological approach so as to facilitate comparisons of potentially competing values.

Environmental values were found to be the most important drawcards. Clear ocean, healthy coral reefs, healthy reef fish and lack of rubbish were ranked top four most important values, out of a total of 21. Similar observations were made by Saltzer (2002) who found that experiencing the beauty of nature, being in a natural place, experiencing an undeveloped environment, water quality, fish, corals, and other marine life, are important reasons for visiting the GBRWHA. In a parallel study of residents' perception of key GBRWHA-based values, Larson et al. (2014) found environmental factors to be most important to their overall quality of life *relative* to commercial activities, such as mining, agriculture and fishing. Indeed, there is ample evidence that the environment has positive influences on wellbeing and quality of life (Vemuri, 2004, Kopmann and Rehdanz, 2013). This linkage holds true in tourism as well, perhaps best explained by the *Push and Pull Theory*. Rest and

relaxation are key push factors for holidaying, whereby people seek to escape from the daily routine. The natural environment acts as a key pull factor, offering, for example, scenery and tranquillity, thereby facilitating visitors' need for restoration (Hammitt, 2000, Ulrich et al., 1991).

When importance and satisfaction scores are compared, satisfactions with the majority of environmental values are significantly lower than importance scores. This is potentially bad news for tourism operators, marketers and those tasked with protecting and managing the GBRWHA. It is these core values that attract visitors to the GBRWHA. Accordingly, urgent and focused attention is required; major competitive weaknesses in these values would be quite difficult to overcome despite competitive strengths in other areas (Fishing, Bragging, Seafood).

Whilst it may be argued that tourists' perceptions are subjective and are not generally based on objective and scientifically verifiable facts (Janssen and Hamm, 2012), in this study, this view does not hold. For example, water clarity (Clear ocean) was deemed the most important value but the level of satisfaction with it was low. This value in particular, has been the subject of much concern amongst many scientists, with evidence of increased sedimentation and nutrient loads (Butler et al., 2013, Brodie et al., 2008). There is also confirmation that low water quality contributes to the decline in coral biodiversity (De'ath and Fabricius, 2010, Schaffelke et al., 2012) and fish species composition (Fabricius et al., 2005). These findings thus reflect the perceptions of visitors in this study who attributed lower satisfaction than importance to healthy coral reefs and reef fish.

Interestingly, visitors had a stronger negative reaction to the prospect of four different types of environmental degradation (oil spills, water clarity, rubbish and coral cover) than to a hypothetical 20% increase in local prices. This is an important finding as tourism is prone to the risk of currency fluctuations, as well as many other economic risks, with a high Australian dollar having an impact on Australia's tourism competitiveness, leading towards both lower visitor numbers and lower expenditures (Deloitte Access Economics, 2013). However, this research indicates that deterioration of environmental features of the GBR, as a nature destination, might have more profound impact on visitations than changes in costs, be that due to exchange rates, prices or otherwise.

Our analysis also clearly indicates that different types of visitors are likely to respond differently to change. Indigenous tourists, for example, indicated that environmental deterioration would have had a larger negative impact on their decision to visit this region than their non-Indigenous counterparts. This accord with expectations: it is widely acknowledged that Indigenous people have deep connections to 'country' (Garnett and Sithole, 2007, Ganesharajah, 2009).

Finally, our analysis indicates that the repercussions of lower visitation arising from the degradation of environmental values of the GBRWHA would be greater in the Cairns/Port Douglas region. In fact, potential damages to all of the environmental values considered were found to be highly sensitive in this region. These are important findings for this highly nature-tourism dependent region, which is known to account for the largest proportion of tourism-related expenditure and employment (Deloitte Access Economic, 2013). Interestingly, some respondents in this study were opposed to having more tourists, with indications of lower length of stay in the far north. The Cairns/Port Douglas region is said to be well-positioned to take advantage of the burgeoning Asian market (China being the most prominent) and there is a proposal for a new AUS$4.2 billion resort and casino complex in that region. However, responses from both the Chinese and Japanese visitors in this study suggest that either environmental degradation or more tourists would have led this cohort to spend less time in the region. Evidently such changes will attract new visitors, but do not appeal to all.

More research into the loss of other values not considered in this paper is needed, however, the clear message is that environmental values of the GBRWHA are more important *relative* to market factors such as changes in prices, and their consequential decline will severely impact on the entire Reef catchment's economy. Future research would benefit from the consideration of additional market factors, other than prices, such as marketing, quality of services, accessibility and investments in tourism infrastructures, etc.

Conclusion

This study has contributed to the body of knowledge on destination competitiveness. Although it was focused on the GBRWHA, the methodological approaches demonstrated here can be used elsewhere and in different destination specific context, such as: a rainforest area (nature-based), a museum or festival event (culture-based), or between Reef destinations, to identify the relative strengths and weaknesses of competing destinations. It provided information on a set of competitiveness indicators (values) to identify the aspects of the destination (GBRWHA) that influences visitors' decision to visit a place (i.e. what values they find to be important). Performance on these indicators (i.e. satisfaction with each value) can be monitored over time to compare different policy measures and to identify the best strategy for increasing tourism flows. This study has also demonstrated an alternative way of assessing the way in which management decisions (i.e. 'changes' in different values) can impact on the decision to visit an area, thereby impacting on tourism numbers and, ultimately, expenditures. Although the assessments of change are hypothetical and thus cannot be used as absolute predictions, they do nonetheless provide

(regional) information useful for comparative purposes. The key message from these findings is that tourism success in this region is contingent upon the existence of a healthy ecosystem. The paper provides essential material and methodologies for regional tourism strategy makers, and both practical and political reasons for the support of sustainable tourism strategy making in the GBRWHA.

Notes

1. Although the GBRWHA remains a key natural attraction for many visitors, it has not been immune to the characteristically volatile nature of the tourism industry, and is experiencing stagnation. Since the last economic contribution study conducted for the Reef in 2007, total visitor days/nights grew by only 4% to 42.8 million over the five years to June 2012. International visitor nights in particular, fell by 10% over the period, with more overseas tourists visiting the capital cities. However, developments in the domestic market compensated for this weakness, with a 9% growth rate over the five year period, making domestic overnight visitors the key source of tourism revenue (Deloitte Access Economics, 2013). Various factors have been attributed to this downturn in visitation and, inevitably, contributing to the decline in expenditures in the Reef catchment: a high exchange rate, the impact of the global financial crisis on incomes domestically and abroad, and the impact of natural disasters in Queensland (floods and cyclones).

2. Managing a destination's competitiveness is by no means simple, given the fact that tourism destination, by nature, differs from most competitive products: (1) unlike simple products, managed by a single firm, the tourism product is an experience, delivered by a variety of players (tourism enterprises, supporting industries and organisations, destination management organisations, the public sector, local residents, etc.); (2) the product itself is made up of a number of attributes; (3) each tourist experience is unique; and (4) unclear and incompatible goals, where some goals aim for economic returns and others for environmental and social outcomes (Crouch, 2007).

3. Bequest value is the 'value' that the current generation places on the availability of such values to future generations (Hernández et al., 2014; Lazo et al., 1997) (e.g. preserving the GBRWHA either for its own sake or for future generations).

4. The GBRWHA is home to the largest collection of coral reefs in the world, 1500 species of fish, 1500 varieties of sponges and over 4000 types of mollusc. It is a significant entity for biodiversity conservation supporting extensive sea grass beds and a variety of algae, critical for dugongs and turtles – both of which have been internationally recognised as vulnerable. It is also a breeding area for humpback whales migrating from the Antarctic to give birth in the warm waters (Department of Environment, 2014).

5. Variables such as length of stay, number of previous visits, return to the region and contribution to conservation were found to be endogenous, thus were not included in the model. It was difficult to control so many things at the same time (e.g. endogeneity, the proportional odds assumption, multicollinearity, correlation between the residuals), thus it was decided not to include endogenous variables in the models.

6. Kruskal-Wallis test was performed first: clean ocean ($H(2) = 38.75$, $p < .05.$), no rubbish ($H(2) = 19.26$, $p < .05.$), reef fish ($H(2) = 15.37$, $p < .05.$), coral reefs ($H(2) = 24.34$, $p < .05.$) and oil spills, groundings and waste ($H(2) = 35.83$, $p < .05.$), tourists ($H(2) = 6.50$, $p < .05.$), and fishing ($H(2) = 11.07$, $p < .05.$). Mann-Whitney tests were then used, with a Bonferroni correction (implying a new critical value of .0167) to make pair-wise comparisons.

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Supplemental data 2. Characteristics of respondents determining importance, satisfaction and reaction to change (SUR model)

	Friends (I,S)	Business (I,S)*	Close (I)	Budget (I,S)	Accommodations (I,S)	Seafood (I,S)	Fishing (I,S,C)	Beach (I,S)	Boating (I,S)	Indigenous (I,S)	Sunshine (I,S)	Bragging (I,S)	Undeveloped (I,S)
Male	-,	+,				-,	+,,	-,-		,-	-,-	,-	,-
Single		-,+				-,							,+
Age	+,	+,+		-,	,+	+,+		-,-	-,-			-,-	
Indigenous	-,									+,			
Education	-,	-,	-	-,	-,			+,		+,-	,-		+,
Household Income				-,						-,	-,	-,	
Household size													
Visitor Queensland	+,	+,	+	+,+	+,		+,+,	-,	-,	-,-	-,	-,-	-,-
Visitor from the rest of Australia		+,	+	+,+	+,	+,	+,,		-,	-,-		-,-	-,
China		+,	+	-,+	-,	+,	+,,			,+	-,	,-	
Japan		+,	+	+,	-,	+,+	,+,	-,		-,	-,	,+	-,
Traveling as a couple	-,	-,		+,	+,			+,+		-,	+,+		+,+
Traveling as a family with children		-,+	+	+,	+,			+,			+,		+,
Traveling with friends		-,-		+,		+,	+,,	+,	+,	,-	+,	+,	
Traveling with a tour group	-,	-,-		-,									
Business Visitor													
Visitor from Mackay/ Rockhampton area	+,	+,			-,-		+,+,	,-	+,		-,-	+,	
Visitor from Townsville/ Whitsunday area	+,	+,			,-				+,+		,-		

Cont' of Supplemental data 2	No rubbish (I,S,C)	Coral reefs (I,S,C)	Reef fish (I,S,C)	Iconic marine species (I,S)	Clean ocean (I,S,C)	Wet tropics (I,S)	Iconic land species (I,S)	Mangroves (I,S)	Tourists (C)	Oil spills, groundings & waste spills (C)	Increase in prices (C)
Male	-,-,			-,	-,,		-,				
Single					,,+						
Age		,,+	,,+	-,				+,			+
Indigenous		,,-	,,-		,,-	+,	+,	+,			
Education	+,,	+,,-	+,,	+,	+,,-		-,-		-	-	-
Household Income		-,,-	-,,	-,		-,	-,				
Household size						-,					
Visitor Queensland	-,-,	-,-,	-,-,	-,	-,-	-,	-,-	-,	-		
Visitor from the rest of Australia		-,-,	-,-,	-,	-,-	,-	-,-	-,			
China	,+,			,+	,,-						
Japan	-,,	-,,	-,,	-,		-,	-,	-,+			
Traveling as a couple	+,+,	+,+,	+,+,+	+,+	+,	+,+	+,	+,+			
Traveling as a family with children	+,,	+,+,	+,+,	+,	+,+	+,+	+,	+,+			
Traveling with friends	+,,	+,,	+,,	+,-	+,		+,	,-			
Traveling with a tour group							,+				
Business visitor	,,+	,,+	,,+		,,+				+	+	+
Visitor from Mackay/Rockhampton area						-,-	-,-	,-		+	
Visitor from Townsville/Whitsunday area						-,-	-,	,-	+	+	

* For Satisfaction Friends + Business combined; no Close variable for satisfaction.

(+) indicates the relationship was positive and statistically significant; (-) = negative and statistically significant; a blank field indicates no statistically significant relationship.