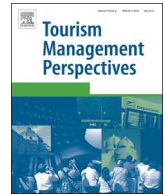




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# Tourism Management Perspectives

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## Human value co-creation behavior in tourism: Insight from an Australian whale watching experience

Jinghua Xie<sup>a</sup>, Aaron Tkaczynski<sup>b,\*</sup>, Nina K. Prebensen<sup>c</sup><sup>a</sup> Norwegian Hotel College, The Faculty of Social Sciences, University of Stavanger, Norway<sup>b</sup> School of Business, Faculty of Business, Economics & Law, University of Queensland, Cnr Blair Drive & Campbell Street, St Lucia, QLD 4072, Australia<sup>c</sup> School of Business and Economics, The Faculty of Biosciences, Fisheries and Economics, The Arctic University of Norway, Tromsø, Norway

## ARTICLE INFO

## Keywords:

Human value co-creation  
Behavior  
Perceived value  
Satisfaction  
Tourism  
Whale watching

## ABSTRACT

This study explores and tests a comprehensive model of co-creation in creating value and tourist satisfaction. In addition to being the first study to empirically test the customer value co-creation behavior scale developed by Yi and Gong (2013), the present work adds to theory by revealing the importance of tourists' mental co-creation and employees' active participation in creating value and satisfaction for the customer. Factor analyses and econometric models of logit model and multivariable ordinary least squares regression are applied to a sample of 1024 whale watching tourists. The study finds that tourists' participation is more important in influencing their perceived value during the experience than their satisfaction. Employees' input is key to the experience in enhancing tourists' value and satisfaction. The main contribution of the study is the inclusion of co-creation behaviors from different human actors including tourists and employees. Opportunities for future research are outlined.

### 1. Introduction

Ever since the development of pioneering service quality models such as SERVQUAL (SERvice QUALity) (Parasuraman, Zeithaml, & Berry, 1988) and the Nordic service quality model (Grönroos, 1982), knowledge regarding the financial and strategic importance of human involvement in the service delivery consideration for tourism providers has amplified. Research (Pralhad & Ramaswamy, 2004; Prebensen, Woo, et al., 2013) has provided information regarding how various actors participate in creating and co-creating value in different consumption settings. In tourism, both the host (e.g. tour operators) and guests (e.g. tourists) are resource instigators (Arnould, Price, & Maishe, 2006; Vargo & Lusch, 2008) and are actively involved in creating and co-creating the tourism experience (Buoincontri, Morvillo, Okumus, & van Niekerk, 2017; O'Sullivan & Spangler, 1998).

Co-creation, which is researched in contexts such as cultural (McCartney & Chen, 2020; Richards, 2011) and nature-based (Prebensen & Foss, 2011; Prebensen et al., 2013b) tourism, is delineated by Prahalad and Ramaswamy (2004, p. 8) as "joint creation of value by the company and the customer". Although an organization is required to provide the necessary resources such as location and employees for an experience to happen (Campos, Mendes, do Valle, & Scott, 2018), the literature stresses the role of the tourist and their

antecedents (e.g. involvement, creative skills) and outcomes (e.g. satisfaction, repurchase intentions) to the success of a co-created tourism experience (McCartney & Chen, 2020). From an organizational perspective, tourists' antecedents and outcomes from a co-created experience can provide a viable and sustainable approach to tourism management and development (Buoincontri et al., 2017; McCartney & Chen, 2020).

During an experience, tourists' participation in value co-creation may reflect interactions with front-line employees such as guides and service staff (Grönroos, 2006, 2011) and/or other tourists (e.g. people on the same tour but not personally known to a tourist) experiencing the same tourist offering (Malone, McKechnie, & Tynan, 2017; Richards, 2014). Interaction between front-line tourism providers and tourists will greatly impact on an individual tourist's evaluation of a tourism experience (McCartney & Chen, 2020; Prahalad & Ramaswamy, 2004).

Even though research pinpoints the imperative of the customer holding a set of key resources (e.g. Vargo & Lusch, 2004; Yi & Gong, 2013) and the concept of co-creation is widely and variously adopted by tourism scholars (Campos et al., 2018; Prebensen, Vittersø, & Dahl, 2013), few studies (e.g. McCartney & Chen, 2020; Richards, 2014; Yi & Gong, 2013) provide precise composition of customer value co-creation behavior. Furthermore, despite employees' and other tourists' input

\* Corresponding author.

E-mail addresses: [jinghua.xue@uis.no](mailto:jinghua.xue@uis.no) (J. Xie), [a.tkaczynski@uq.edu.au](mailto:a.tkaczynski@uq.edu.au) (A. Tkaczynski), [nina.prebensen@uit.no](mailto:nina.prebensen@uit.no) (N.K. Prebensen).

potentially providing positive or negative influences on a tourism experience (Arnould et al., 2006; Arnould & Price, 1993), these concepts are often ignored in the co-creation literature. There is the potential that tourists' value co-creation together with front-line employees of the tourism provider and other tourists experiencing the same offering would impact on tourists' value evaluation of the tourism experience (Blazquez-Resino, Molina, & Esteban-Talaya, 2015; Hsiao, Lee, & Chen, 2015).

### 1.1. Research Aim

To identify the relative importance of host and guest participation in co-creating experience value and satisfaction for the tourists, this study aims to test the customer value co-creation behavior scale developed by Yi and Gong (2013) within a comprehensive model that integrates theoretical related constructs of perceived value and satisfaction (e.g. Buonincontri et al., 2017; Prebensen, Kim, & Uysal, 2016). The behaviors formulated by Yi and Gong (2013), either required or voluntary, only occur when the customer is physically interacting with an employee or other tourists. These inputs are bodily contribution required for the co-creation of a tourism experience and are, therefore, called customer physical co-creation behaviors (Buonincontri et al., 2017).

The literature suggests co-creation practice consists of not only physical magnitudes as previously discussed, but also mental magnitudes (e.g. Minkiewicz, Evans, & Bridson, 2014; Rodie & Kleine, 2000). Mental participation reflects an individual tourist's personal interest in the co-creation of the tourism experience (Campos et al., 2018; Prebensen & Xie, 2017). Consequently, both elements are augmented into this study's model. Furthermore, in the interaction between tourists, employee and other tourists, the roles of employees and other tourists can be both active and passive. Active involvement means employees and other tourists actively seek to communicate with, respond to or co-operate with tourists. For example, employees are friendly, and are willing to help customers. Conversely, passive means employees and other tourists only interacts with tourists when required or approached (Binkhorst & Dekker, 2009; Loureiro, 2014). For example, a tourist may be friendly to the employee and assist other tourists if the other tourists needed help. In the study, both employees' active and passive involvement are measured.

This research is conducted at an Australian destination that specializes in whale watching tours. Considerable co-creation research (Prebensen et al., 2016; Prebensen, Vittersø, and Dahl, 2013) has been conducted within similar contexts (e.g. outdoor) to this study. By employing first Yi and Gong's (2013) customer value co-creation scale which has been successfully applied within related fields such as accommodation (Pera, 2017; Revilla-Camacho, Vega-Vázquez, & Cossío-Silva, 2015) and second perceived value and satisfaction literature within the contexts of whale watching, the outlined research aim can be answered; specifically to gain insight into the importance of host and guest participation in determining both tourist co-creation experience value (e.g. personal interaction, responsible behavior, feedback) and satisfaction from an Australian whale watching experience.

## 2. Literature review

### 2.1. Human inputs

Human interaction between the tourist and an organization represents the essence of the co-creation of a tourism experience (Campos et al., 2018; Prebensen & Foss, 2011). Whilst tourism providers may control certain elements such as the core service elements of an activity (e.g. transport, ticketing, serving), the success of a tourism experience as perceived by the tourist is based on not only the environment in which the experience is consumed, but also the active and positive participation and interaction of all tourists and employees (Li & Petrick, 2008; Morgan, Elbe, & de Esteban Curiel, 2009). Furthermore, the

unruly or negative behavior of individual tourists may also inhibit the tourism experience (O'Sullivan & Spangler, 1998; Prebensen, Woo, & Uysal, 2014). Thus, both tourists and tourism providers are co-creators of value and co-producers of a tourism experience (Li & Petrick, 2008; Sørensen & Jensen, 2015).

#### 2.1.1. Tourists' physical and mental co-creation

Yi and Gong (2013) propose a scale of customer value co-creation behavior consisting of two dimensions including customer participation behavior and citizenship behavior. The components of customer participation behavior include information seeking, information sharing, responsible behavior, and personal interaction. Similarly to previous research that makes slight modifications to the scale to better reflect the co-creation experience (e.g. Pera, 2017; Revilla-Camacho et al., 2015), Yi and Gong's (2013) model is used in the present study with the following adjustment. Since the focus is on on-site co-creation experience (whale watching trip), the dimensions measuring customer participation before or after on-site activities (e.g. Jamilena, Peña, & Molina, 2016) are not adopted in this study as they are not co-produced by tourists and employees. They are information seeking and information sharing in the factor of customer participation behavior and advocacy in the customer citizenship behavior. Consequently, after adjustment, the study includes responsible behavior and personal interaction in customer participation behavior and feedback, and helping and tolerance in customer citizenship behavior.

The interactions of tourists with employees and other tourists are identified by the components of personal interaction and helping, respectively. As previously discussed, since the measurements in personal interaction and helping are how tourists behave towards employees or other tourists such as they are friendly to employees or other tourists, the scales only measure the passive involvement of employees and other tourists in tourist value co-creation. The active involvements of employees are discussed in the next section (2.1.2).

The definitions of the scales proposed by Yi and Gong (2013) are discussed in their study as follows. Responsible behavior is where customers recognize their duties and responsibilities as partial employees (Ennew & Binks, 1999). They are to follow the service provider's directives or orders, and co-operatively complete the expected behaviors and tasks. Personal interaction is interpersonal relations between customers and employees of the company, such as where the customer is friendly and courteous to employees. Responsible behavior and personal interaction denote the in-role behavior customer performed to achieve value through co-creation behavior. Feedback means positive or negative information about activities delivered by customers to employees. Helping is assistance, advice and help of one customer to other customers. Tolerance is customer patience with an employee's mistake or unexpected service quality. Feedback, helping and tolerance are customer citizenship behavior, which is the spontaneous extra-role behavior not necessarily required but voluntarily performed by customers (Yi & Gong, 2013).

The behaviors mentioned previously, either required or voluntary, only occur when the customer is physically participating in tourism activities or interacting with an employee or other tourists. They are, therefore, customer physical co-creation behaviors (Buonincontri et al., 2017). However, Rodie and Kleine (2000) categorize value co-creation practices as mental; physical; and emotional participation. Minkiewicz et al. (2014) divide value co-creation into co-production; engagement; and personalization. The literature evidently suggests co-creation behaviors have both physical and psychological magnitudes (Prebensen et al., 2016; Prebensen & Xie, 2017). Prebensen and Xie (2017) suggested mental co-creation is even more important than physical co-creation in enhancing perceived value in adventure tourism. Therefore, mental co-creation is also included in the current study. Following Prebensen and Xie (2017), the mental co-creation is reflected by personal interests in the experience. Specifically three items are included in the measurement. They are: How interested are you in whale

watching?; How interested are you in nature (e.g., climate, ocean, landform, fauna, and flora)?; and How interested are you in protecting nature?

### 2.1.2. Employee input to value co-creation

As previously discussed, the employees' co-creation with tourists can be both passive and active. The passive role has been reflected by the personal interaction scale in Yi and Gong (2013). Specifically, in Yi and Gong's (2013) co-creation scale, the scale of personal interaction, which include items such as "I was friendly to the employee", measures both tourists co-creation and employee's passive involvement. The active role of employees is critical in delivering quality service and, therefore, measured by a separate scale. Service quality measures such as SERVQUAL (Parasuraman et al., 1988) and the Nordic model of service quality (Grönroos, 1982) focus extensively on the employee input into the delivery of an experience across various tourism contexts such as heritage sites (Frochot & Hughes, 2000) and accommodation (Getty & Thompson, 1993). Essentially, the success or failure of employee performance can positively or negatively affect post-purchase outcomes (Bitner, Booms, & Tetreault, 1990; Lovelock & Wirtz, 2010). Many researchers have underscored a significant impact of employee service quality on customer satisfaction and loyalty (e.g. Salanova, Agut, & Peiró, 2005; Vilares, Almeida, & Coelho, 2010).

### 2.1.3. Other tourists' inputs to value co-creation

Interactions between intragroup (friends and families who travel together) and intergroup (unacquainted tourists who meet during the experience) interactions between tourists (Pearce, 2005) are shown to be importance in the evaluation of a customer's service experience (Prebensen, Vittersø, and Dahl, 2013; Rihova, Buhalis, Moital, & Gouthro, 2015). In fact, interaction amongst group members is a crucial theme that is consistently monitored through the evaluation of a tourism experience (Huang & Hsu, 2010) and other tourists have been found to both positively (Arnould & Price, 1993; Prebensen & Foss, 2011) and negatively (Turley & Milliman, 2000; Yagi, 2001) influence a tourism experience. The interaction of tourists with other tourists is identified in the current study. However, different from employees who are participating as both active and passive agents in tourists value co-creation process, other tourists' involvement is only passively included in Yi and Gong's (2013) scale of "helping" in tourists co-creation scales. In the scale, the component "helping" including items such as "I assisted other tourists if they needed my help", other tourists are passive involved.

## 2.2. Customer perceived value and satisfaction

Zeithaml's (1988, p. 4) definition that perceived value can be viewed as a "consumer's overall assessment of the utility of a product based on perception of what is received and what is given" has largely been employed by scholars as a holistic measure of perceived value (Bajs, 2015; Prebensen, Vittersø, and Dahl, 2013). Researchers conceptualize many dimensions to customer co-created value. Sheth, Newman, and Gross (1991) propose that value represents both the hedonic and utilitarian (functional) value for the customer. This is characterized by four distinct dimensions labeled as emotional; social; quality/performance; and price/value for money. Sweeney and Soutar (2001), in employing Sheth et al.'s (1991) model, suggest that perceived value encapsulates epistemic value in addition to functional, emotional and social value.

Functional value which represents the "perceived utility acquired from an alternative's capacity for functional, utilitarian or physical performance" (Sheth et al., 1991, p. 160) is frequently employed by co-creation tourism researchers (e.g. Mohd-Any, Winklhofer, & Ennew, 2015; Williams & Soutar, 2009). Owing to the importance of the core experience within the services literature such as functional quality in the Nordic model (Grönroos, 1982) and reliability as a dimension of

SERVQUAL (Parasuraman, Zeithaml, & Berry, 1985), researchers aim to identify the quality, reliability, safety and efficiency of the experience as delivered by the tourism provider (e.g. Gallarza & Saura, 2006; Williams & Soutar, 2009).

Often incorporated into functional value (Lee, Kruger, Whang, & Sirgy, 2014; Prebensen, Woo, et al., 2013) or evaluated separately (Chen & Chen, 2013; Prebensen & Xie, 2017), is the value for money/economic value dimension. This element of perceived value suggests that tourists will recognize value in a tourism experience if the price they have paid represents the quality that they perceived that they have experienced (Mohd-Any et al., 2015). Largely due to the emotional response needed by tourists to be actively involved in experience creation (e.g. Prebensen, Vittersø, and Dahl, 2013; Sørensen & Jensen, 2015), researchers employ emotional value (e.g. Jo, Lee, & Reisinger, 2014; Prebensen et al., 2016) in conceptualizing value co-creation. A social value is defined as "perceived utility acquired from an alternative's association with one or more specific groups" (Sheth et al., 1991, p. 161). Rasoolimanesh, Dahalan, and Jaafar (2016) determine tourists' value a relationship with the other guests, residents and tourism providers at a Malaysian homestay. Epistemic or novelty value represents potential tourists' curiosity and the need to learn and to experience something new (Sheth et al., 1991). Epistemic value has been used in a variety of contexts such as adventure tourism (Williams & Soutar, 2009) or war-heritage sites (Lee, Yoon, & Lee, 2007).

As noted above, considerable research aims to determine tourists' perceived value of an experience (on-site/in-situ) across a variety of contexts (Prebensen et al., 2016; Prebensen, Vittersø, and Dahl, 2013). The literature largely argues that perceived value as an antecedent positively affecting tourists' satisfaction (Buonincontri et al., 2017; Jamilena et al., 2016), and satisfaction is largely transpired through the value created in and during the experiential encounter (Mathis, Kim, Uysal, Sirgy, & Prebensen, 2016; Prebensen et al., 2016).

## 3. Conceptual model and hypotheses

The literature previously outlined suggests that human involvement is crucial to customer co-creation behavior and the customer's evaluation of perceived value and satisfaction. With individual tourists representing resource instigators in the co-creation of a tourism experience (Arnould et al., 2006; Vargo & Lusch, 2008), an increasing focus on the need for tourists to actively interact with employees as well as other tourists in the co-creation of a tourism experience through customer participation and customer citizenship behavior is suggested (Hsiao et al., 2015; Yi & Gong, 2013). The following hypotheses are proposed and also presented in Fig. 1.

As can be viewed in Fig. 1, tourist's co-creation includes both tourist's physical and mental co-creation. Employee's co-creation includes both employee's active and passive interaction with tourists. Other tourists' involvement is only passive. Accordingly, three human actors which are decomposed to five co-creation elements are included in the model. To identify if each of these co-creation elements represents perceived value, the first hypothesis (H1) is proposed.

**H1 :** Tourists' physical and mental co-creation behavior (H1a and H1b), employees' active and passive co-creation behavior (H1c and H1d), and other tourists' passive co-creation behavior (H1e) directly influence tourists' evaluation of their perceived value for the experience.

Due to the importance of the relationship between perceived value and satisfaction (Buonincontri et al., 2017; Prebensen et al., 2016), a second (H2) and a third (H3) hypothesis are proposed, which will determine if this relationship between the constructs can be similarly identified when Yi and Gong's (2013) co-creation model is employed. Specifically, the model addresses the individual co-creation dimensions (H2) then the combined perceived value (H3) construct.

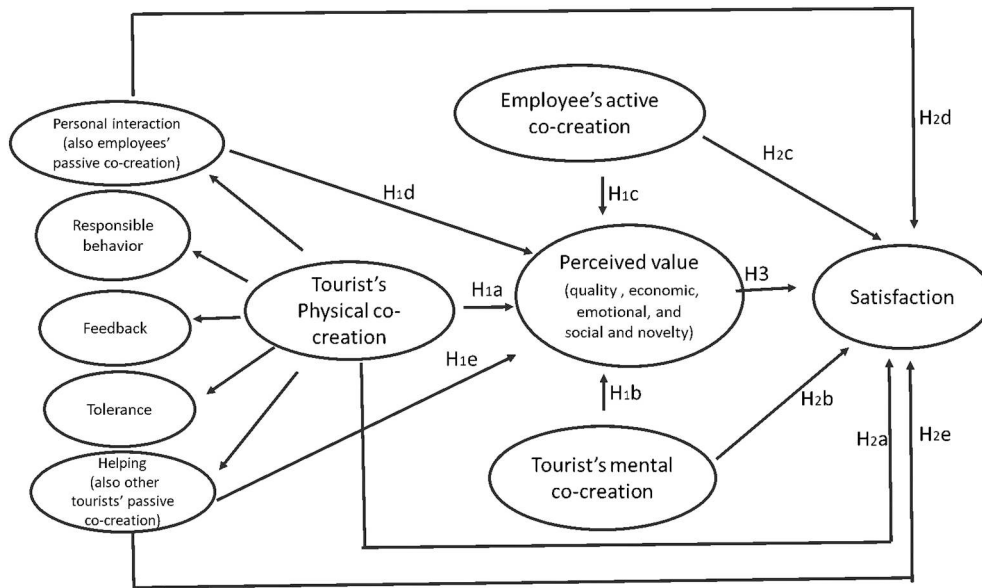


Fig. 1. Conceptual Framework.

**H2 :** Tourists' physical and mental co-creation behavior (H2a and H2b), employees' active and passive co-creation behavior (H2c and H2d), and other tourists' passive co-creation behavior (H2e) directly influence tourists' satisfaction level.

**H3 :** Tourists' perception of value is an antecedent of tourists' satisfaction.

The final hypothesis (H4) is to acknowledge that the potential importance of human co-creation on satisfaction is not only limited to its direct effect on satisfaction, but also includes its indirect effect on satisfaction by increasing perceived value. If the first and third hypotheses are accepted, H4 must also be accepted. That is, co-creation behaviors influence tourists' satisfaction by creating perceived value. This is listed as follows:

**H4 :** Perceived value functions as a mediator between tourists' co-creation and satisfaction.

#### 4. Study design

##### 4.1. Case study

Tourists that participated in a guided commercial whale watching tour at a South-East Queensland destination in Australia represent the study cohort. Although the yearly and seasonal (e.g. peak, shoulder) number of whale watching experiences at both the individual operator and destination level are not released to the public due to confidentiality reasons, it was determined from telephone discussions with the regional tourism manager that the destination has averaged approximately 55,000 whale watching tourists annually for the past decade. Each tour averaged between 50 and 70 tourists and the individual prices of a whale watching trip at the destination varied between AUS\$95 to AUS\$110. This price included a guided tour, light refreshments and whale watching marketing material. Additional food and beverages (e.g. alcohol) and souvenirs could be purchased at the canteen.

Whale watching is chosen to represent the context for this research as similarly to other research (Prebensen et al., 2016; Prebensen, Vittersø, and Dahl, 2013), tourists, other tourists, and employees could potentially participate in the co-creation of the whale watching experience. Other tourists and employees could also add or subtract to the value of the experience which could ultimately satisfy or dissatisfy

individual tourists (e.g. Li & Petrick, 2008; Smith & O'Sullivan, 2012). On a typical whale watching experience at the chosen destination, a tourist could passively sit and watch and/or actively take photographs or videos of whales in their natural setting. Tourists also have the opportunity to actively listen to and/or ask questions to whale watching employees (e.g. tour guide and service staff) whom spoke in English. For example, the tour guides on each boat discuss about cetacean wildlife and the role each operator plays in managing environmental sustainability through adhering to marine regulations (e.g. staying a clear distance from whales, not littering in the sea). It is also stated to each individual that they could help to conserve the environment by being environmentally responsible at home and on vacation. Tourists could also choose to interact with food and beverage employees or interact with other tourists. Conversely, tourists can relax and passively experience the whale watching trip (e.g. listen to their own music) whilst viewing the natural surroundings.

All posters and whale watching material provided on whale watching vessels are written in English. A typical whale watching experience at the South-East Queensland destination would last for approximately four hours. Traveling from the shore to the start of the whale watching sightings lasts about 45 min to one hour. This is also the time taken to leave the viewing location and return to the shore for the end of the guided trip.

##### 4.2. Questionnaire development

A self-administered questionnaire (see attached appendix) represents the research instrument for this study. The questionnaire was written in English and was developed based on a review of the literature and discussions with industry practitioners. First, literature (e.g. Prebensen, Vittersø, and Dahl, 2013; Sweeney & Soutar, 2001; Williams & Soutar, 2009 ; Yi & Gong, 2013) was reviewed. Next, whale watching operators within the region and the regional tourism manager were presented with the questionnaire via email and asked for their feedback.

It was concluded that all items developed from the literature were deemed relevant to the co-creation of the whale watching experience and were retained based on industry feedback. However, based on industry insight, slight modifications to the wordings of items for each section was required to portray a whale watching experience. For example, "the service was reasonably priced" was modified to "whale watching was reasonably priced", whereas "participating in the

experience made me feel like an adventurer” was modified to “participating in whale watching made me feel like an adventurer” to represent economic and novelty value respectively.

The questionnaire comprised of five sections. The first section (36 items) aimed to measure tourists' perceived value (functional, economic, emotional, social and novelty) based on the literature review (e.g. Prebensen, Vittersø, and Dahl, 2013; Sweeney & Soutar, 2001; Williams & Soutar, 2009). These questions were organized in a natural way about aspects such as facilities, operations, prices, emotion and socialization. The second section focused on the interaction value. Specifically, this section comprised of items from the SERVQUAL scale (Parasuraman et al., 1988) to measure employee service (13 items) and five of Yi and Gong's (2013) components from their customer co-creation scale. These components are responsible behavior (4 items); personal interaction (5 items); feedback (3 items); helping (4 items); and tolerance (3 items). Two of the components developed by Yi and Gong (2013), information seeking; and information sharing and advocacy were not included due to these before and after consumption experiences have no interaction with other humans on site. Yi and Gong (2013) scales were employed to measure tourists' physical co-creation.

Third, three items of mental co-creation measured as tourists' interest in general nature and whale watching were included. Fourth, three behavioral items of satisfaction; repurchase intentions; and positive word-of-mouth communication were included (Cronin, Brady, & Hult, 2000; Parasuraman et al., 1988). Similarly to the literature (Williams & Soutar, 2009; Yi & Gong, 2013), all items were designed as Likert (1 = lowest, 7 highest) to measure the extent to which respondents differed in their evaluation of the co-creation of the tourism experience. Following literature (Cronin et al., 2000; Cronin & Taylor, 1992), satisfaction was measured as a sole construct “how satisfied were you with the overall experience?”. The final section of the questionnaire included descriptive information (age, gender, income) to provide a profile of the respondents (see Table 1).

Respondents needed to be older than 18 years. A non-probability convenience sampling method was employed where on specific predetermined days with the tourism operators, tourists who had participated in a whale watching tour were asked to complete the anonymous self-administered questionnaire whilst on the return leg back to the shore. Prior to exiting the whale watching vessel, tourists submitted the questionnaire to the data collector. To maximize variation in responses and to cater for the high and shoulder seasons, data was collected across four periods from July to October and on multiple whale watching

vessels, which varied in passenger sizes. All seven days of the week were considered to limit potential bias of a particular demographic. In total, 1024 valid responses (97% of distributed questionnaires) were collected.

## 5. Methodology

### 5.1. Exploratory and confirmatory factor analysis

The exploratory factor analysis (EFA) was applied to identify constructs of perceived value and tourists co-creation behaviors. The reason EFA was first applied is that no prior hypotheses exists about measurable variables in the factors of the constructs of perceived value and tourists co-creation behaviors. When there is no prior hypothesis, EFA is suggested instead of confirmatory factor analysis (CFA) (Hurley et al., 1997). Although the questions about perceived value and co-creation behaviors in the questionnaire are based on literature, these questions are presented to the tourists who participated in the questionnaire in a natural way about facilities, operations, prices, and how glad they were. It is proposed that the more reliable answers will be achieved if the questions are presented in constructs that are more natural in the view of tourists instead of presenting to them by strictly following the theoretical measurement scales suggested by the literature.

EFA is implemented by applying principal component analysis with a varimax rotation using SPSS. Tables 2 and 3 summarize the suggested constructs and items in each construct. The result of the constructs fit the theoretical scales suggested by the literature well, confirming the previous statement that tourists give more correct information when the questions are presented naturally in their viewpoints. Noting although the results are presented in two separate tables for readability, all the scales represent one valid EFA solution. Nine factors including four factors of perceived value, four factors of tourists' physical value co-creation behavior, and one factor of employees' co-creation are extracted, which explain 69% of the variance. The perceived value factors are quality value, economic value, emotional value and social and novelty value as suggested by the literature (e.g. Sheth et al., 1991).

The factor of tourists' mental co-creation is produced using a CFA since a prior hypothesis exists about measurable variables in the factor (Hurley et al., 1997). Table 4 presents the results of CFA. The results of composite reliability (CR) and average variance extracted (AVE) suggest convergent validity for the constructs. The proposed CFA model fits the sample data according to the reported results of all the conventionally fit indices including comparative-fit index (CFI), Tucker-Lewis index (TLI), the normed-fit index (NFI), root mean square residual (RMR), and standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA). The reported Kaiser-Meyer-Olkin (KMO) measure of sample adequacy is 0.955 and *p*-value of Bartlett's test of sphericity is close to zero, warranting further analysis.

### 5.2. Econometric model

Based on the results given by EFA and CFA, the composite variables for each extracted construct, were further used in the econometric models. Two types of models are applied in the present study. To test the first hypothesis (H1), a multivariable ordinary least square regression (OLS) is used. To test hypothesis two (H2) and three (H3), a binary logit model is applied. The variables of perceived value (quality, economic, emotional, and social and novelty) are composite variables created by combining the items loaded in each construct, which are presented in Table 2. They become continuous as a result of the factor analysis, therefore, OLS is applied to test the first hypothesis (Woolridge, 2016). However, since satisfaction is measured by a single

**Table 1**  
Descriptive profile.

	%
Age	
< 25	15.9
25–34	19.8
35–44	15.4
45–54	16.6
55–64	17.3
65 +	15.0
Annual Household Income	
< AUS\$20,000	14.1
AUS\$20,000-AUS\$39,999	11.7
AUS\$40,000-AUS\$59,999	14.4
AUS\$60,000-AUS\$79,999	15.4
AUS\$80,000-AUS\$99,999	12.9
AUS\$100,000 +	31.4
Gender	
Male	34.6
Female	65.4

**Table 2**  
EFA of tourist and employee's value co-creation behavior constructs.

	Factor loading	Eigenvalue	Variance Explained (%)
Tourist's value co-creation behavior			
Personal interaction		4.0	6.4
I was polite to the employees	0.795		
I was friendly to the employees	0.768		
I was courteous to the employees	0.766		
I was kind to the employees	0.748		
I didn't act rudely to the employees	0.651		
Responsible behavior		2.9	4.7
I performed all the tasks that were required	0.749		
I answered all the employees' questions	0.705		
I followed all the employees' directives or orders	0.678		
I adequately completed all the expected behaviors	0.674		
Feedback		2.2	3.5
When I experience a problem, I let the employees know about it	0.802		
when I received good service from the employees, I let them know	0.744		
If I had a useful idea on how to improve the experience, I let employees know	0.737		
Tolerance		2.1	3.4
If an employee made a mistake, I was willing to be patient	0.778		
If I had to wait longer than I normally expected, I would be willing to adapt	0.764		
If the service was not delivered as expected, I was willing to put up with it.	0.744		
Helping		2.8	4.4
I assisted other tourists if they needed my help	0.811		
I helped other customer if they seemed to have problems	0.802		
I gave advice to other customers	0.762		
Other tourists increased the enjoyment of the watching experience	0.520		
Employee's value co-creation behavior			
Employee		8.1	12.9
Employees were friendly	0.794		
Employees were polite	0.793		
Employees appeared well-trained	0.781		
Employees had good communication skills	0.776		
Employees were knowledgeable about whale watching	0.757		
Employees were willing to help customers	0.728		
I could trust the employees	0.670		
Information on safety and security was clearly provided by employees	0.653		
Employees provided prompt service	0.636		
Employees were entertaining	0.553		
Employees knew what my whale watching needs were	0.544		

Note: Kaiser-Meyer-Olkin index = 0.955, Bartlett's test of sphericity = 43,435, df 1953 (p = .000).

item “How satisfied were you with your overall experience?” having value from 1 = “very dissatisfied” to 7 = “very satisfied”, it is, therefore, a discrete variable. For a discrete dependent variable, OLS is not appropriate since it requires the variable to be continuous. Therefore, a logit model, which belongs to the family of discrete choice models, is more proper to test H2 and H3.

The reasons that OLS and logistic modeling was employed instead of Structural Equation Modeling (SEM) is that the logit model does not require the assumption of multivariate normality required by SEM (Prebensen & Xie, 2017). Although partial least squares (PLS-SEM) is suggested when the condition of multivariate normality cannot be satisfied. However, as stated by Vilares et al. (2010) and Hair, Hult, Ringle, and Sarstedt (2016), highly skewed data creates problems in producing robust results and the estimation of significance levels are conspicuous. Hair et al. (2016, p. 78) suggest “researchers should ensure the data are not too far from normal”. The data in this study is highly skewed, which is considered typical of customer satisfaction data (Vilares et al., 2010). Only 10% of the respondents gave scores lower than 5. Therefore, this study follows Prebensen and Xie (2017) procedure and uses logit model instead of SEM in the study. The interpretations of the estimated parameters in the OLS and Logit model are discussed in the following model specifications.

The model specification for the perceived value model (OLS) is as

follows:

$$\begin{aligned}
 \ln Value_i = & \alpha_{i0} + \alpha_{i1} \ln PI + \alpha_{i2} \ln RB + \alpha_{i3} \ln FB + \alpha_{i4} \ln Tole + \alpha_{i5} \\
 & \ln Help + \alpha_{i6} \ln MC + \alpha_{i7} \ln Employee + \alpha_{i8} Gender + \alpha_{i9} \\
 & Edu + \alpha_{i10} Previous + \alpha_{i11} Overseas + \sum_{m=12}^{17} \alpha_{im} Income_m + \\
 & \sum_{n=18}^{22} \alpha_{in} Age_n
 \end{aligned}
 \tag{1}$$

where PI (personal interaction), RB (responsive behavior), FB (feedback) and Tole (Tolerance) and Help (helping) are the scale of customer value co-creation behavior developed by Yi and Gong (2013). They are measurements of the tourists' physical co-creation as discussed in the literature review. MC is the mental co-creation of tourists measured by their interests in experience. Employee denotes employees' active co-creation. As previously mentioned, personal interaction presents tourists' behaviors towards employees and helping outlines tourists' behaviors towards other tourists in the same tourism experience. Therefore, PI and Help also identify the passive co-creation of employees and other tourists in the process of tourist value creation as illustrated in Fig. 1. The left are controlling variables describing tourists' profile including

**Table 3**  
EFA of tourist's perceived value constructs.

	Factor loading	Eigenvalue	Variance explained (%)
Quality value		4.6	7.3
The whale watching operator used up-to-date equipment	0.713		
The appearance of the facilities represented a whale watching experience	0.698		
The whale watching operator performed all tasks by the allocated time	0.659		
The whale watching operator managed records accurately	0.648		
The employees were well dressed	0.620		
The whale watching experience was well designed	0.590		
The physical setting of the whale watching experience was visually appearing	0.576		
The quality of the whale watching experiences was consistent for the whole trip	0.533		
Economic value		3.4	5.5
Whale watching was correctly priced	0.862		
Whale watching was reasonably priced	0.858		
Whale watching offered value for money	0.814		
Whale watching was economical	0.730		
Emotional value		6.9	10.9
Whale watching made me feel good	0.813		
Whale watching gave me pleasure	0.813		
Whale watching was exciting	0.787		
Whale watching made me happy	0.768		
Whale watching gave me a sense of well-being	0.742		
Whale watching was stimulating	0.738		
The whale watching experience was memorable (from "operations")	0.628		
The whale watching experience was authentic (from "operations")	0.566		
Whale watching was relaxing	0.539		
Social and novelty value		6.5	10.3
Participating in whale watching allowed me to improve the way I am perceived	0.930		
Participating in whale watching enabled me to make a good impression	0.927		
Participating in whale watching gave me social approval	0.915		
Participating in whale watching helped me feel accepted	0.899		
Participating in whale watching helped me to meet like-minded people	0.728		
Participating in whale watching allowed me to master my skills (from "operations")	0.723		
Participating in whale watching enabled me to enhance new physical skills (from "operations")	0.709		
Participating in whale watching made me feel like an adventure (from "operations")	0.500		
Total variance			69.3

Note: Kaiser-Meyer-Olkin index = 0.955, Bartlett's test of sphericity = 43,435, df 1953 (p = .000).

gender, having education higher than high school or not, having been on the whale watching trip or not, from overseas or not, and different income levels.  $i = 1, 2, 3$  and  $4$  denote the equations for four dimensions of perceived value. They are quality value, economic value, emotional value and social and novelty value, respectively. The estimated parameters of the variables in natural logs (ln) can be interpreted as elasticities. The estimated parameter of personal interaction ( $\alpha_{i1}$ ) is interpreted as: when tourists' personal interaction score increases by 1%, the tourists' perceived value in  $i$  dimension (e.g., quality value) increases by  $\alpha_{i1}$  per cent.

An ordered logit model should be more appropriate for the satisfaction model since the satisfaction variable is a single variable measured by 7 point Likert scales ordered from 1 = "very dissatisfied" to 7 = "very satisfied" as discussed above. However, the data is highly skewed with few respondents score 5 or lower. Therefore, the satisfaction data was aggregated to two categories by following the similar approach taken by Mehmetoglu (2014).

**Table 4**  
Confirmatory Factory Analysis (CFA) of mental co-creation construct.

	Loading	Z-value	Composite reliability	Average variance extracted
Mental co-creation (interest)			0.79	0.56
How interested are you in whale watching?	-	-		
How interested are you in nature (e.g., climate, ocean, landform, fauna, and flora)?	0.860	9.82		
How interested are you in protecting nature?	0.844	9.51		

df = 8, CFI = 0.973, TIL = 0.949, NFI = 0.970, RMR = 0.037, SRMR = 0.027, RMSEA = 0.097.

and Prebensen and Xie (2017). Specifically, respondents are placed into two categories. Those who have scored 5 or lower are considered less satisfied compared to those who have scored 6 or above. A binary logit model is thus applied.

After the data transformation, tourists' scoring 6 and above are categorized to those taking decision  $y = 1$  (more satisfied) and otherwise  $y = 0$  (less satisfied). The probably of  $y = 1$  is dependent on predictors including tourists and employees' co-creation behaviors and perceived value of experience. Hereby, it is assumed that the tourists' satisfaction is directly affected by its antecedent, perceived value and co-creation from both tourists' and employees' sides. Consequently, H2 and H3 are tested. This analysis can be formulated as:

$$y = \begin{cases} 1, & x'\beta + \varepsilon > 0 \\ 0, & \text{else} \end{cases} \quad (2)$$

where  $\varepsilon$  is an error term following the standard logistic distribution;  $x$  is a vector of the explanatory variables. McFadden (1974) proves the

probability of  $y = 1$  is:

$$Prob [y = 1] = \frac{e^{x'\beta}}{1 + e^{x'\beta}} \tag{3}$$

If denote  $x'\beta$  is denoted as  $z$ , and the probability function as  $F(z)$ , eq. (3) can be rewritten as:

$$F(z) = \frac{e^z}{1 + e^z} \tag{4}$$

The marginal effect of any explanatory variable  $x_i$  on the probability of  $y = 1$  can be derived by:

$$\frac{dF}{dx_i} = \beta_i F(z) \cdot (1 - F(z)) \tag{5}$$

**Table 5**  
Estimated results for value equations.

	Quality	Economic	Emotional	Social and novelty value
Intercept	0.082 (1.26)	-0.004 (-0.018)	0.151* (1.80)	-0.295 (-0.976)
Personal interaction	0.090** (2.42)	0.207* (1.79)	0.059 (1.23)	-0.125 (-0.719)
Responsible behavior	0.082**	0.139 (1.23)	-0.050 (-1.06)	0.043 (0.256)
Feedback	0.007 (0.584)	0.111** (3.07)	-0.002 (-0.155)	0.307** (5.66)
Tolerance	0.005 (0.345)	0.063 (1.35)	0.0004 (-0.020)	-0.006 (-0.092)
Helping	-0.001 (-0.129)	0.054 (1.59)	0.023* (1.68)	0.380** (7.46)
Mental co-creation	0.072** (3.01)	0.065 (0.87)	0.154** (5.03)	0.150 (1.34)
Employee	0.669** (14.10)	0.287* (1.95)	0.740** (-12.1)	0.261 (1.18)
Gender		-0.042* (-1.82)	-0.038 (-4.02)**	
Education				-0.105* (-2.82)
Previous trip	0.018** (2.04)	0.046 (1.62)		0.111* (2.75)
Overseas		-0.056** (-2.12)		
Income AUS \$20,000-39,999	0.024* (1.67)			0.065 (0.967)
Income AUS \$40,000-59,999	0.02 (1.29)			0.130** (2.05)
Income AUS \$60,000-79,999	0.02 (1.29)			0.007 (0.107)
Income AUS \$80,000-99,999	0.030** (2.17)			0.001 (0.012)
Income AUS \$100,000+	0.027** (2.22)			-0.073 (-1.29)
Income not known	0.024 (1.14)			0.143 (1.45)
Age 25-34		-0.014 (-0.415)		
Age 35-44		0.034 (0.889)		
Age 45-54		0.021 (0.556)		
Age 55-64		0.074* (1.86)		
Age 65+		0.044 (0.926)		
R <sup>2</sup>	0.60	0.22	0.48	0.38

\* significant at 10% level  
\*\* significant at 5% level.

The empirical specification of  $z = x'\beta$  is:

$$Z_{sat} = \beta_0 + \beta_1 PI + \beta_2 RB + \beta_3 FB + \beta_4 Tole + \beta_5 Help + \beta_6 MC + \beta_7 Employee + \beta_8 QUV + \beta_9 ECV + \beta_{10} EMV + \beta_{11} SNV + \beta_{12} Gender + \sum_{m=13}^{18} \beta_{im} Income_m \tag{6}$$

where QUV, ECV, EMV, SNV denote quality value, economic value, emotional value and social and novelty value, respectively. The other variables are the scales of tourists and employees' co-creation behaviors and the controlling variables, which are defined in the same way in the value eq. (1).

### 5.3. Estimated result

Both the multivariate OLS and logit model were estimated by using R programing. The estimated results of the parameters and the associated  $t$  values are presented in Tables 5 and 6 respectively. The estimated results are overall satisfactory, as an adequate number of the variables are statistically significant with the right signs. The results strongly suggest the importance of co-creation from both tourists' side and employees' side in enhancing both tourists' perceive value and satisfaction with the experience.

Beginning with the value model, Table 5 shows eight of the estimated parameters of the scale are statistically significant. It suggests tourists' physical co-creation in general is important in enhancing tourists' evaluation of their perceived value in experience. Specifically, the estimated parameter of personal interaction is significant in both the quality and economic value equations, and the estimated parameter of responsible behavior is significant only in the economic equation. Neither of them is significant in either emotional or social and novelty value. On the contrary, helping is significant in emotional equation and social and novelty equation, not significant in either the quality value or economic value equations.

Quality value and economic value are assessed and the estimated results suggest tourists' participation behavior affects their utilitarian components, not hedonic aspect of the perceived value. This makes sense since the participation behaviors such as following the employee's directives and preforming all the required tasks are necessary for the successful completion of the activities provided in the experience process. Without these behaviors, activities cannot be fulfilled (Yi & Gong, 2013). However, on the other hand, tourists' citizen behavior such as

**Table 6**  
Estimated marginal effect in satisfaction equation.

	Coefficients	t value
Intercept	-330**	(-9.61)
Personal interaction	-0.013	(-0.404)
Responsible behavior	-0.025	(-0.857)
Feedback	0.007	(0.425)
Tolerance	0.008	(0.486)
Helping	-0.001	(-0.077)
Mental co-creation	0.038*	(1.68)
Employee	0.096**	(2.03)
Quality value	0.156**	(4.21)
Economic value	0.065**	(3.82)
Emotional value	0.217**	(5.13)
Social and novelty value	-0.009	(-0.629)
Gender	-0.083	(-1.37)
Income AUS \$20,000-39,999	-0.038	(-0.324)
Income AUS \$40,000-59,999	-0.136	(-1.258)
Income AUS \$60,000-79,999	-0.094	(-0.888)
Income AUS \$80,000-99,999	-0.248**	(-2.49)
Income AUS \$100,000+	-0.012	(-0.124)
Income not known	0.037	(0.206)

\* significant at 10% level  
\*\* significant at 5% level.



helping and assisting other tourists are irrelevant to the quality of the perceived experience of functioning, but are more relevant to hedonic and esthetic aspects of values, as suggested by the estimated results. Helping and extending empathy to other people usually make people feel pleasure and well-being. Interaction with other people participating in the same experience makes people feel social approval and easier to meet like-minded people. The estimated results of PI and Help also indicate the passive human involvements of employees and other tourists enhance the tourist's perceived value.

The estimated parameters of feedback are significant in both economic and social and novelty value equations. Those who would like to give either positive or negative feedback might be more positive and open than others and thus be easier to please and would have higher evaluation of the value they have perceived. Tolerance is not significant in any equation. The reason might be that because the majority of tourists are quite satisfied with the experience, tolerance is not really an issue in the experience since they do not need to put up with unexpected poor quality, wait a long line or be patient with mistakes made by employees.

The estimated parameters of mental co-creation are significant in the quality value and emotional equations, indicating tourists' interest in the experience improving the perception of value. This suggests tourists are more likely to explore experience value of an event when it corresponds with their personal interests. Consistent with the findings given by [Prebensen and Xie \(2017\)](#), this study determines that mental co-creation is more influential in enhancing utilitarian value than hedonic value. As previously discussed, the estimated parameters in value equation are quantified as responsiveness of one percentage change in an explanatory variable to the percentage change in the dependent variable. Thus, the estimated results of the mental co-creation indicate that when mental co-creation scale increases by 1%, tourist's emotional value and quality value will increase by 0.154% and 0.072%, respectively. This means mental co-creation has double effect on emotional value than on quality value.

In addition to participation in co-creation from the tourist's side, it was found that employee's co-creation is of key influence on tourist value. This statement is based on the result that the estimated parameters of customers' co-creation are statistically significant in all value equations except for the equation of social and novelty value, and the magnitudes of the parameters are with large sizes. Specifically, the estimated parameters indicate when the scale of employees' co-creation level increases by 1%, the perceived values in dimensions of quality value, economic value and emotional value increases by 0.669%, 0.287% and 0.740% respectively. The results are reasonable, as tourists will largely regard customer co-creation as one part of service quality provided by an experience provider.

Based on the estimated results of the tourists own physical (H1a) and mental (H1b) co-creation, the results of employees active (H1c) and passive (H1d) co-creation and other tourists' passive co-creation (H1e), a clear conclusion can be drawn that the human co-creation of these

actors directly influence tourist's evaluation of their perceived value. Therefore, the first hypothesis (H1) is accepted.

Table 6 presents the estimated results of the satisfaction model. The presented marginal effects of the predictors in Table 6 are estimated by using formula (5) based on the estimated parameters  $\beta$  in eq. (6). In the second hypothesis (H2), it is assumed that tourists; other tourists; and employees' co-creation behaviors directly enhance tourist's satisfaction. This hypothesis is proven to be partly accepted based on the following estimated results. None of the variables in the scales of physical value co-creation are statistically significant, suggesting tourists' physical co-creation and passive interaction of employees and other tourists do not directly affect tourist satisfaction level, and thus the hypothesis H2a, H2d and H2e are rejected. While, on the other hand, the estimated results of tourists' mental co-creation and employees' active co-creation behaviors are estimated to be positive and significant, indicating both H2b and H2c hold. Thus, H2 is partly accepted.

Three of the four estimated parameters of the perceived value variables are significant, which indicates improvement in a tourist's perception of value overall should lead directly to a tourist's satisfaction. Therefore, H3 that perceived value is an antecedent of satisfaction is accepted. A point of concern is the insignificant parameter of social and novelty value. One way to explain for this is that the whale watching experience concerned in the current study does not provide much social identification and tourists in this experience might feel less epistemic compared to sport tourism such as sea surfing, cycling tours and canoeing. As H1 and H3 are accepted, H4 is also accepted. Therefore, as co-creation enhances perceived value and perceived value is an antecedent of satisfaction, perceived value functions as a mediator between tourists' and employees' co-creation and satisfaction.

## 6. Discussion and conclusion

This study contributes to tourism management theory and practice by fulfilling the main aim of testing [Yi and Gong's \(2013\)](#) customer co-creation behavior scale in collaboration with perceive value and satisfaction to an Australian whale watching experience. The outcomes of the research hypotheses are presented in Table 7. The major contributions are now discussed in turn.

### 6.1. Theoretical implications

In addition to confirming the previous findings (e.g. [Prebensen & Xie, 2017](#); [Williams & Soutar, 2009](#)) of the importance of individual tourists' co-creation, the study also finds employees and other tourists are relevant for the co-creation of a tourism experience and directly influence an individual tourist's perceived value of the experience and subsequent satisfaction rating. This, therefore, confirms the literature that supporting service can be more important than the core service (e.g. [Hume, 2008](#); [Tkaczynski & Stokes, 2010](#)) when customers evaluate their experience, e.g., their level of satisfaction.

**Table 7**  
Hypothesis Findings.

Hypothesis	Description	Outcome
H1a	Tourists' physical co-creation behavior directly influence tourists' evaluation of their perceived value for the experience.	Accepted
H1b	Tourists' mental co-creation behavior directly influence tourists' evaluation of their perceived value for the experience.	Accepted
H1c	Employees' active co-creation behavior directly influence tourists' evaluation of their perceived value for the experience.	Accepted
H1d	Employees' passive co-creation behavior directly influence tourists' evaluation of their perceived value for the experience.	Accepted
H1e	Other tourists' passive co-creation behavior directly influence tourists' evaluation of their perceived value for the experience.	Accepted
H2a	Tourists' physical co-creation behavior directly influence tourists' satisfaction level.	Rejected
H2b	Tourists' mental co-creation behavior directly influence tourists' satisfaction level.	Accepted
H2c	Employees' active co-creation behavior directly influence tourists' satisfaction level.	Accepted
H2d	Employees' passive co-creation behavior directly influence tourists' satisfaction level.	Rejected
H2e	Other tourists' passive co-creation behavior directly influence tourists' satisfaction level.	Rejected
H3	Tourists' perception of value is an antecedent of tourists' satisfaction.	Accepted
H4	Perceived value functions as a mediator between tourists' co-creation and satisfaction.	Accepted

Although exceptional employee input is consistently acknowledged as a precursor to satisfaction (e.g. Grönroos, 1982; Parasuraman et al., 1988), and, therefore, this study's finding of employees' co-creation is not novel; tourists' opportunity to help and interact with other like-minded tourists as an element of co-creation value in tourism is a noteworthy theoretical finding. Tourists' citizen behavior (e.g. helping and assisting others) is relevant to hedonic and esthetic aspects of perceived experience values. Perhaps due to the mutual interest in the nature-based activity, tourists may feel good about helping other tourists that are in need, with the altruistic behavior resulting in customer delight (e.g. Ma, Scott, & Ding, 2017; Scott, Laws, & Boksberger, 2009) instead of functional value.

The estimated results in the satisfaction function suggests the second hypothesis that tourists', employees' and other tourists' co-creation behaviors directly enhance tourists' satisfaction is only partly supported. Importantly, the entire tourist's physical co-creation variables are not significant while both tourists' mental co-creation variable and employees' active co-creation variable are significant in the satisfaction equation. The results of inefficient tourists' physical co-creation is consistent with the findings given by Prebensen and Xie (2017). While different from Prebensen and Xie (2017) which suggests that tourist's mental co-creation is not efficient, the present study finds that they are. Specially, the estimated result suggests when the scale of mental co-creation increases by one unit, the probability of tourist feeling more satisfied increases by 3.8%.

Based on this study's research findings, it can be argued that tourists' participation are similarly more important in directly influencing their perception of experience value than their satisfaction. This statement is also supported by the estimated results that the magnitudes of estimated parameters of the mental co-creation in the value equations are all much bigger than that in the satisfaction equation, indicating the more significant effects of mental co-creation on perceived values than on satisfaction. The estimated results of the perceived value variables in the satisfaction equation significantly suggest perceived value is an antecedent of satisfaction which largely supports the literature (Buonincontri et al., 2017; Jamilena et al., 2016). Satisfaction is, therefore, a result of tourists and employees co-creating value.

## 6.2. Managerial implications

Whilst tourism operators may compete on their comparatively favorable natural surroundings (Crouch & Ritchie, 1999; Hong, 2009), this study confirms that human input into the co-creation of a tourism experience must also be considered by operators to deliver a tourism experience of value to tourists (e.g. whale watchers). To increase the likelihood of perceived value and subsequent tourist satisfaction, great care needs to be taken in all tourists' interaction with not only the physical environment but also the human interactions in the same tourism experience.

To facilitate a quality experience, whale watching operators need to ensure that tourists have the opportunity to actively speak with staff and other tourists during their whale watching trip. This implication is drawn from the results of the study that tourists' (whale watchers) personal interactions with staff and other tourists comprised both quality and economic value. Although being close to whales or experiencing a pristine natural environment may be primary attractors for tourists in choosing to experience a whale watching trip (Orams, 1996, 2000), this study suggests that active involvement of employees by actively seeking to communicate with, respond to or actively seek tourists is important in enhancing tourists perceived value and satisfaction (Binkhorst & Dekker, 2009; Loureiro, 2014). This further suggests that whale watching trip may be a social event where a positive experience may result in tourists interacting with each other over potentially mutual interests.

As tourists' perception of economic value represents a key concern in tourism (Chen & Chen, 2013; Mohd-Any et al., 2015), whale

watching operators need to continually offer the high quality services such as exceptional customer service and opportunity to interact with other tourists. The destination under study is internationally regarded as a high class whale watching destination through its heavy marketing material on this activity, numerous tourism Australian state and national awards, and eco-certification of all whale watching operators. As whale watching tourists tend to be higher educated and earn a higher level of income (Parsons et al., 2003; Parsons & Brown, 2017) it can be assumed that these tourists appreciated the high quality whale watching experience which adhered to environmental guidelines and were satisfied with paying the price (between AUS\$95 to AUS\$110) for a perceived high quality offering.

Perceived value was determined to be an antecedent of satisfaction and also functions as a mediator between tourists' and employees' co-creation and satisfaction. Consequently, whale watching operators should not simply ignore the tourist's physical co-creation behaviors in the experience. It is true that they do not enhance the satisfaction level directly; but they do enhance satisfaction level via creating more value of the experience. On a whale watching tour, larger whale watching operators (e.g., more than 50 tourists) may not have the option of providing an individual, customized experience. However, the operators could seat customers with similar characteristics (e.g. age, life-cycle) in different locations on the vessel (e.g. child-free zones). Furthermore, greater front-line staff could be provided for tourists that may have greater service requirements (e.g. disability access). Similarly, smaller vessels which provide a more customized experience could price differently based on the number of tourists on each interaction and the personal experience with employees (e.g. a personalized experience).

## 6.3. Limitations and opportunities for future research

Despite the significant contributions, there are a number of limitations of this study. An obvious limitation is that the current study is not able to identify the active inputs of other tourists. Thus, the role of the other tourists in tourist's value co-creation is only passive. Similarly, employees' co-creation is measured from tourist's point of view of the employees' performance and their interaction with tourists. The employees' own views of their co-creation with tourists are not considered. Therefore, an opportunity for future research is to determine if specific skills based on employees' knowledge and background including employment status, educational background, and languages other than English proficiency improve employees' service quality and hence increase tourists' value and satisfaction (e.g. customer service, tour commentary).

Second, tourist's mental co-creation is measured by a single dimension of interest. Although this item identified tourists' high interest in whale watching, mental involvement should be rich and complex (Campos et al., 2018; Prebensen & Xie, 2017), therefore exploring mental co-creation from different perspectives such as what it means to the tourist through in-depth qualitative research might be a fruitful area of inquiry. This process could identify the moment of true happiness and also identify if the whale watching experience is part of a broader experience that a tourist desires with or without the same companions. Further, as research is emphasizing conservation as necessary for the survival of tourism experiences that are dependent on natural surroundings (Hughes, Packer, & Ballantyne, 2011; Parsons & Brown, 2018), future research can seek to measure tourists' likelihood on behaving environmentally responsible whilst on vacation. As whale watching operators at the destination are adhering to regulations (Department of Biodiversity Conservation and Attractions, 2017; Department of Environment and Science, 2016), it would be interesting to determine if whale watching tourists understand how these operators' tours are providing high quality tours that are also environmentally responsible. Should these tourists learn how employees are actively seeking to conserve the environment, this might influence

tourists to actively behave environmentally responsibly on vacation and whilst at home after being exposed to information on a whale watching tour.

Third, this study has focused on whale watching vessels that have similar passenger sizes (e.g. between 70 and 90 people). Future research could compare whale watching vessels of different sizes (small, medium and large). Here, it could be determined if the customer co-creation behavior, perceived value and satisfaction of tourists differ based on the level of service provided to tourists. Furthermore, this analysis could determine if a more customized, less scripted procedure is followed for smaller vessels carrying fewer tourists.

Fourth, the study is performed on one type of tourist experience, whale watching. Future research is recommended to extend the usage of the co-creation scale such as conducting research across different contexts. This could include land-based activities such as wildlife safaris, dogsledding or marine-orientated options such as dolphin feeding or swimming with sharks. This process can extend the value of the setting on tourist value perception and satisfaction. It will also provide new knowledge to tourism management theory as well as to practice.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.tmp.2020.100709>.

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**Dr. Jinghua Xie (PhD)** is an Associate Professor at both Norwegian School of Hotel Management, University of Stavanger, and School of Business and Economics, UiT/The Arctic University of Norway. She has published many papers within consumer demand in various journals. Tourism is one of her main research interests. .



**Dr Aaron Tkaczynski (PhD)** is a Senior Lecturer in tourism and events at the University of Queensland, Australia. His research expertise stems from market segmentation. Dr Tkaczynski is extremely interested in research into nature-based attractions, seasonality and cultural festivals.



**Professor Nina K Prebensen (PhD)** is professor in Marketing at UiT and University of South East Norway. Prebensen has a long list of publication in highly regarded journals and books. Currently she is associate editor in three top tier journals. Prebensen has led the research Centre for Innovation and Management at USN where she also had a position as professor. She has managed projects such as “Service Innovation and Tourist Experiences in the High North: The Co-Creation of Values for Consumers, Firms and the Tourism Industry”. Prebensen has started and managed the research group “Experiential Marketing, Management and Innovation (EMMI)”