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A big data analytics approach

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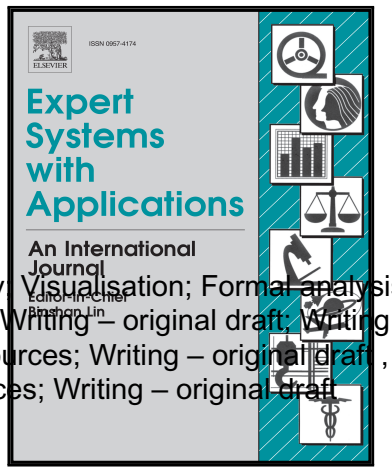

Measuring Employee-Tourist Encounter Experience Value: A Big Data Analytics Approach

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Highlights

- Tests a conceptual model of experience value in tourist-employee encounters.
- Text analytics approach using combined conceptual dictionaries and big data.
- The five concepts significantly determine hotel customer satisfaction outcomes.
- Approach provides low cost solution for continuous measurement from reviews.

Measuring Employee-Tourist Encounter Experience Value: A Big Data Analytics Approach

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Abstract
This paper takes a text analytics approach to measuring dimensions of employee-visitor encounters that impact on visitor outcomes. A conceptual model measuring dimensions of employee-tourist encounters is implemented using a big data analytics approach more suited to large-scale online review data than the traditional, limited survey approach. Using a dictionary-based measurement approach and a large sample of reviews for hotels (n=265,016), we test the model and the importance of the factors for leveraging perceptions of satisfaction, service and value. The results demonstrate the importance of the different dimensions of experiential value in employee-tourist encounters in creating positive tourist perceptions. This knowledge is crucial for tourism companies aiming to create experiential value for visitors, rather than simply delivering service quality.

Keywords: employee-tourist encounter; model; big data analytics; dictionary; text analytics.

1. Introduction

In the experience economy literature, it is emphasised how experiences are crucial for value creation for service users as well as for service companies (e.g. Boswijk, Peelen, Olthof, & Beddow, 2012; Pine & Gilmore, 2013; Sundbo & Sørensen, 2013). In tourism, the role of encounters between tourism employees and tourists play a potentially important role in experience-related value creation. However, these encounters often rely on a functional and standardised service logic (Solnet and Baum, 2015), thus the potential of encounters for experience creation in tourism companies often remain underused (Sørensen & Jensen, 2015).

While different service quality measurement instruments exist (Cronin & Taylor, 1994), few attempts have been made to estimate users' experiential value resulting from employee-user encounters. Rather than focusing on functional properties related to services, their efficiency, and users' quality expectations and perceptions, were argue that dimensions such as emotions, learning and co-creation must be considered. These are dimensions that have been emphasized as central for experiential value creation in experience economy related literature (Pine & Gilmore, 2013; Prahalad & Ramaswamy, 2004; Sundbo & Sørensen, 2013). This is also the case for an increasing amount of tourism literature inspired by experience economy thinking (Armbrecht, 2014; Barnes, Mattsson, & Sørensen, 2016; Cabiddu, Lui, & Piccoli, 2013; Tung & Ritchie, 2011; Chang, 2018).

In this paper, we fill this theoretical gap by developing and implementing a conceptual model that aims at estimating how key dimensions of employee-tourist encounters affect experiential value in destination-based tourism companies. The theoretical model of employee-tourist experience value includes five dimensions of employee-tourist experiential value creation (based on previous empirical work, see Sørensen & Jensen, 2015; Barnes et al., 2019) that build on the empirical experience economy literature. The model goes beyond traditional service-dominant logic (Vargo et al., 2008; Vargo & Lusch, 2004) to advocate that experience-focused encounters do not deliver precise and predetermined value, but rather they embody the possibility of a company and its employees to become part of and to influence tourists' experiential value creation while flexibly fine-tuning human interactions and using resources during a tourist-employee interaction.

Our contribution uses text analytics approach and big data to help overcome some of the biases of traditional survey-based research. Surveys suffer from numerous potential disadvantages, including sampling error (particularly for small samples), consumer inattention in surveys, measurement error from constructs inaccurately or narrowly defined, common method bias, consumer response set bias (e.g. social desirability bias, extremity in

response, recall bias, acquiescence bias, leniency bias, and carelessness), and a lack of testing of predictive validity. Whilst survey data can provide scientific evidence at a small scale (typically in the thousands) using self-reported questionnaires, reviews can provide powerful insights into the real thoughts and feelings of tourists using their own words at a very large scale (in the hundreds of thousands). We apply big data analytics and customer reviews to identify the types of customer-employee interactions that are the most influential in improving customers' perceptions of service, value and overall satisfaction. The use of large volumes of natural text data and text analytics methods provides the opportunity to capture much richer, more complex service conceptualisations using a broader and more representative set of words relating to customers and staff. Demographic data captured at scale can be used to assess representativeness. The study is based on empirical data from a popular hotel review website. Each review is content analysed for sentiment and interaction type in order to explore important relationships statistically.

The structure of the paper is as follows. In the next section, we examine the literature foundation on tourist-employee encounter experiences and value creation. This is followed by the research design and method chapter, including developing keyword dictionaries and collecting and analysing review data using text analytics. Section 4 applies the dictionaries for each of our five concepts via hotel review data and perceptual measures of service, value and overall satisfaction. Finally, the paper concludes with a discussion of the results, including implications for research, managerial implications, limitations of the research, and plans for future investigations.

2. Literature Review

2.1 Experiences and Experience Value

Customers increasingly focus on experiential value, putting pressure on service companies, which must move from functional service delivery to creating experiences. Thus, recent service experience literature has argued that unique, personal, meaningful and co-created experiences, rather than physical products and functional service deliveries, are key to value creation in modern economies (Boswijk, Thijssen, & Peelen, 2007; Grönroos & Voima, 2013; Sundbo & Sørensen, 2013). In particular, the Experience Economy literature has emphasised how companies must focus on experiential values instead of products and services (Boswijk et al., 2007; Pine & Gilmore, 2013).

Tourism is at the core of the Experience Economy. A central purpose of tourism is to create experiences. Such tourist experiences are "at the very heart of tourism" (Shaw, Bailey, & Williams, 2011) and pursuing, having and remembering experiences is the main reason to travel away from home for most (non-business) tourists. While tourism experience has for long been an important concept in tourism research (e.g. Cohen, 1979), the Experience Economy literature develops new more business-oriented perspectives on tourist experiences (Andersson, 2007; Mossberg, 2007; Shaw et al., 2011). While tourism and experiences being central to tourism are, of course, not new phenomena, new demands from tourists put increasing pressure on many destination-based tourism providers to create experiences rather than deliver plain services (Kandampully & Solnet, 2015; Sørensen & Jensen, 2015).

Experience Economy theory defines experiences, for example, as a mental impact felt and remembered by an individual, caused by a personal perception of external stimuli, and elaborated via the awareness that people have of earlier experiences as well as mental needs (Sundbo & Sørensen, 2013). Developing experiences is therefore conceptually different from (however often overlapping with) delivering services. Their focus is on creating feelings, affection and memories. Services, on the other hand, aim primarily at helping or solving problems for customers. Furthermore, services are delivered to customers, but experiences arise within individuals. Companies can therefore not produce experiences in their entirety,

they can only provide elements that lead to subjective experiences within individuals (Sundbo & Sørensen, 2013; Jensen & Sørensen, 2018); thus, even though companies such as Disney train employees to create experiences, the designed experience may be experienced differently by different consumers, and must always tested in a usage situation. The value of experiences cannot be predetermined by the company (or by the user) but arises as a sort of value in use (Sandström, Edvardsson, Kristensson, & Magnusson, 2008).

The qualities associated with experiences differ from those associated with services, but they lack clarification. Service quality is typically associated with efficiency and perfectionism of the delivered service. It is typically measured as satisfaction or dissatisfaction, which is associated with how users' expectations match perceived service performance (Cronin & Taylor, 1994). Qualities of experiences are inherently more complex. As indicated above, experiential qualities can be associated with aspects that relates to subjective feelings and affection. Experience-oriented literature have also, for example, emphasised different qualities of experiences such as uniqueness and extraordinariness. Uniqueness, for example, may relate to experiences that are co-created with tourists to cope with their individual needs and wishes rather than experiences that are made to suit all or specific segments (Grissemann & Stokburger-Sauer, 2012). Extraordinariness (Arnould & Price, 1993) refers to experiences that stand out from what is normal and represent particularly memorable events (Abrahams; 1986).

This does not discard that more traditional, service-oriented values also play a role for users' overall perception of experiences. For instance, the efficiency of the check in at a hotel may affect the overall hotel experience, but it does not itself result in a significant experience. From a value in use perspective, Sandström et al. (2008) conceptualise the "service experience" (a concept otherwise often confused with service quality) to result from a subjective user perception of a mix of functional and emotional value propositions.

2.2 The Employee-Tourist Encounter Experience

In the Experience Economy literature, it has been argued that employees should "stage" experiences for customers, thus employees may be understood as performers in an act (Pine & Gilmore, 1999). However, the importance of interactive encounters has been emphasised recently. Such encounters are important for co-creation (Prahalad & Ramaswamy, 2004), learning (Boswijk, Thijssen, & Peelen, 2007), and immersion (Hansen & Mossberg, 2013). Thus, while overall experience is affected by a complex combination of elements, including physical surroundings, images, brands, social relations, prior experiences, other consumers, and so on (Berry, Carbone, & Haeckel, 2002; Helkkula, Kelleher, & Pihlström, 2012; Sørensen & Jensen, 2017), interactive encounters between employees and users are central for many types of experiences and experiential value.

The role of customer satisfaction in employee-consumer encounters has been investigated for many years (Bitner et al., 1990). The encounters have been characterised as 'moments of truth' (Carlson, 1989). In experiences, the role of encounters is not less important, but they have different relevance. In tourism, encounters between employees and tourists are central to consumer (i.e. tourist) satisfaction (Baum, 2005). Tourist's experiences are typically dependent on a number of such encounters at tourist destinations (Weiermair, 2000; Sørensen & Jensen, 2015). Nevertheless, in destination-based tourism companies, such as hotels, the encounters continue to be largely guided by a traditional service paradigm which results from a sectorial focus on cost-efficiency and standardization (Binkhorst & Den Dekker, 2009; Kandampully & Solnet, 2015; Sørensen & Jensen, 2015). Thus, the main purpose of encounters is to help tourists in efficient and professional ways, i.e. they are structured, scripted and standardised (Sørensen & Jensen, 2015). This 'service encounter paradigm' follows a goods-dominant logic (Vargo, Maglio, & Akaka, 2008) in which

companies perceive themselves as producers of predetermined value delivered to tourists. However, this focus on plain service is a paradox considering that tourism is a sector in which customers seek and pay for experiences above anything else (Sørensen & Jensen, 2015).

Recent literature argues that refocusing employee-tourist encounters towards experiential value creation implies the introduction of a new set of characteristics of such encounters. First, these studies indicate how *flexibility* in encounters is key for the potential to create experiential value in encounters. As indicated above, employee-tourist encounters are often scripted and standardised to create and secure uniform services and to keep down costs (Baum, 2006). Employees trained in service schools and tourism companies often rely on their hyper-professionalism (Sundbo, 2011), i.e. doing their job correctly, not stepping outside standard procedures or making mistakes. While this secures a specific level of service quality, this pure focus on delivering service functions means that many potential avenues to create and support unique tourist experiences in encounters are missed (Sørensen & Jensen 2015).

Second, *co-creation* in encounters can sustain unique and personal experiences and increase revisit intentions (Grissemann & Stokburger-Sauer, 2012; Zátori 2016). Co-creation in encounters in tourism is argued to result in better experiences because it sustains employees in helping in the creation of unique experiences by facilitating that individual tourists' individual needs and wishes are taken into consideration and supported (Sørensen et al., 2018). This role of co-creation has been illustrated, for example, in travel agencies (Grissemann & Stockburger-Sauer, 2012) and travel tours (Zátori, 2016). In the latter, co-creation included involving tourists on guided tours and in making them discover the destination. Conversely, lack of co-creation possibilities with tourism employees may reduce tourists' experiential value (Prebensen & Foss, 2011). As in the service-dominant logic perspective (Vargo et al., 2008; Vargo & Lusch, 2004), co-creation in employee-tourist encounters will attempt to sustain creation of individualised 'value in use'. In the tourism experience context, this translates into an 'experience-dominant logic' in which employee-tourist encounters aim at supporting memorable subjective and personalised experiential value. Consequently, experience-focused encounters should not deliver specific and predetermined value, but rather they represent a possibility for the company and its employees to become part of and to influence the tourist's experiential value creation while flexibly adjusting interactions and utilising resources, for example knowledge (c.f. below). Thus, in experience-oriented employee-tourist encounters employees (as well as tourists) can be perceived as operant resources (c.f. Echeverri & Skålén, 2011) that (co-)produce effects (Shaw et al., 2011). The hotel service context provides significant, underdeveloped co-creation opportunities (Chathoth et al., 2013; Harkison, 2018).

Third, employees' informative engagement with guests which results in *learning and knowledge creation* in encounters is argued to facilitate tourists' experiences (Sørensen & Jensen 2015). While such learning may itself sustain experience creation (Boswijk et al. 2007) it also facilitates immersion (Caru & Cova, 2006) in tourist destinations and absorption in activities, for example in river rafting (Arnould & Price, 1993) and dog-sledging (Hansen & Mossberg, 2013), and in this way facilitates extraordinary experience. In the mentioned cases, learning about the destination facilitates an understanding about the activities that are performed (e.g., river rafting and dog sledging), so that they are performed in secure and joyful ways, but at the same time this creates an understanding of the destination environment that support the tourists' immersion in the destination experience.

Fourth, experiences are fundamentally about creating *emotions* and this becomes another element of relevance for experience creation in encounters. Changes in emotional states results in experiences (good or bad) (Jantzen, 2007) and employee-tourist encounters

represent a possibility for influencing emotions (Jensen & Sørensen, 2018). This is argued to require certain experiential or emotional intelligence of employees that helps them to act on tourists' emotions (Baum, 2006; Kandampully & Solnet 2015; Sørensen & Jensen, 2015). Experiential intelligence is a kind of social capability that allows tourism employees to empathise, interact with their customers, and identify with their expectations and requirements, experientially and emotionally (Baum, 2006). It helps employees understand the essence of tourism experiences (Sfandla & Björk, 2012) and the emotional state and needs of tourists and to act on this emotional state to influence it to create unique experiences (Jensen and Sørensen 2018). Thus, tourism employees are 'emotional workers' (Seymour, 2000): their emotional engagement is crucial to experiential value creation in encounters and front-line employees working with experience creation must themselves see this as an experience (Bærenholdt et al., 2008).

Finally, *personalised* behaviour in employee-tourist encounters can affect tourist experiences (Kandampully & Solnet, 2015; Baum, 2005). Scripts, uniforms and standardisation of employee behaviour hide employees' unique personalities and help create standardised service quality, but the potential for creating experiential value in encounters can be limited in this way. Conversely, employees' personal traits, their individual and personal capabilities and knowledge can, when activated in encounters, result in more authentic encounters and support authentic and unique experiences rather than standardised services (Pine and Gilmore, 2007; Sørensen & Jensen, 2015). Memorable customer experiences requires *personalisation* (Kandampully & Solnet, 2015).

Thus, in sum, to create experiential value in employee-tourist encounters these must sustain more personalised interactions, flexibility, co-creation, creation of emotions, learning and knowledge creation. This, it is argued, results in enhanced value for tourists as well as for employees and companies (e.g. Hansen & Mossberg, 2013; Binkhorst & Den Dekker, 2009; Sørensen & Jensen, 2015; Zátori 2016). In an experiment in a hotel, for example, encounters with such dimensions were illustrated to create experiential value not only to tourists but also to employees who experienced higher job satisfaction (Sørensen & Jensen, 2015). Barnes, Mattsson, Sørensen & Jensen (2019) found that experience value played a mediating role between experiential elements of employee–tourist encounters and outcomes such as memory of experience and recommendation intention.

3. Research Design and Method

In this section, we describe a method for measuring the five dimensions of tourist-employee encounter experience value using a big data set of hotel reviews. Recent research has demonstrated that text analytics using big data sets of review content from tourists (often referred to as user-generated content), can provide significant insight into visitor behaviour, perceptions of delivered services, and satisfaction (Guo et al., 2017; Liu et al., 2017; Marine-Roig & Clavé, 2015; Ye et al., 2011).Whilst survey data can provide scientific evidence at a small scale (typically in the thousands) using self-reported questionnaires, reviews can provide powerful insights into the real thoughts and feelings of tourists using their own words at a very large scale (in the hundreds of thousands). This can help to avoid some of the issues of bias that is inherent in surveys. In the following subsection, we examine the problems with survey scales and the search for alternative methods. This is followed by an examination of the research process followed in this study.

3.1 Problems with Survey Scales and the Search for Alternatives

Both traditional (e.g. Churchill, 1979; Bearden, Netemeyer, & Mobley, 1993) and modern (e.g. DeVellis, 2016; Rossiter, 2002) approaches to survey design have been heavily criticised for the way that they have been applied to services and tourism research (Gilmore

& McMullan, 2009; Kock, Josiassen, & Assaf, 2019; Yüksel, 2017). A key potential issue in survey design is measurement error, where survey items may not accurately reflect the focal topic or do not evoke truthful or accurate answers (Dillman, Smyth, & Christian, 2014; Singleton & Straits, 2009). This can be particularly problematic when constructs are not clearly defined, there are problems with interpretation, order and wording of questions, constructs are defined in terms that are too narrow, conditions or factors create response bias, or questions are deeply embedded in a context and difficult to generalise to new situations (Gilmore & McMullan, 2009; Oskamp, 1991). A common method bias may occur, where variance is due to the survey method rather than the measurement constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Particular types of response sets can invalidate survey answers (De Vaus, 1996; Yüksel, 2017). Such response biases are wide-ranging including: social desirability (where a respondent provides an answer that makes them appear more favourable to the researcher); extremity in response (i.e. selecting the most extreme answers); recall bias (i.e. the ease of recalling recent or more serious events); acquiescence bias (i.e. a tendency to agree with statements); leniency bias (i.e. higher ratings for involved persons); and carelessness (often as a result of inattention). Yüksel (2017) found that response bias and the lack of corrective action for response bias problems are significant issues in tourism research, leading to potentially biased and flawed statistical results and research findings.

Brosnan, Babakhani and Dolcinar (2019) found that consumer inattention is a significant problem in surveys, negatively affecting up to 15% of survey data. Problems included improper reading of instructions, questions and answers, dwindling attention over the course of the survey, and a disjoint between actual and self-reported completion behaviour. Customer review data is unlikely to suffer the same issue, since the collection mechanism is simpler and more natural; data is presented in the respondent's own voice, from an individual perspective.

Another key problem with survey scale research is sampling error, where individuals included in a sample may not represent the same characteristics or insufficiently cover the population of interest (Dillman et al., 2014). This can be particularly the case in samples that are small, single-mode, snapshot, and/or convenience samples (including student samples, that are common in social science research). Strategies to ameliorate this problem including a better understanding of the population of interest and seeking a larger respondent sample through more diverse methods (Singleton & Straits, 2009). Thus, a huge sample of visitor review data from all potential visitors collected through a natural language interface would appear to offer a much higher degree of representativeness. Demographic data collected can be used to further assess representativeness.

Gilmore and McMullan (2009) criticise survey scales and argue for the application of new research approaches in services research, given that: "In a service sector such as hospitality some consideration needs to be given to alternative measurements for service delivery given the complexity of processes that involve the customer, the front-line, back office and ancillary services people in the different service areas and functions" (p. 646). They further suggest "a more creative and open-minded approach to designing research methods for service problems, taking account of the unique features and priorities of the research question." Similarly, Dolcinar (2007) criticises the uncritical use of traditional, multicategory surveys scales due manifest problems with validity. Gilmore and McMullan (2009) suggest using alternative methods such as observational studies, in-depth interviews and focus groups. However, we would further suggest that qualitative customer review data also fulfils their criteria for alternative methods and provides an important tool for understanding services research. The use of large volumes of natural text data and text analytics methods provides the opportunity to capture much richer, more complex service

conceptualisations using a broader and more representative set of words relating to customers and staff.

Kock et al. (2019) criticise the development of measurement scales in tourism, pointing to a lack of studies that measure predictive validity and nomological validity. In this study, our conceptualisations of experiential value in employee-tourist encounters are not only measured (using text analytics) but tested in hotel service quality context for predictive and nomological validity.

3.2 Steps in the Text Analytics Research Process

A summary of the research process followed is shown in Figure 1. The conceptual foundation for the research, including the key concepts involved, was covered in section 2. Let us now examine each of the remaining steps, in turn.

*** INSERT FIGURE 1 ABOUT HERE ***

3.2.1 Data Collection

A popular and well-known review website was selected to provide text reviews and rating data for a range of hotel rankings (one- to five-stars). English language reviews and related variables associated with each review were downloaded. After removing duplicates, this provided 265,016 reviews for analysis, capturing data for 25,670 hotels located in 16 countries, with the largest countries/regions being the United States (38%), Europe (37%), South Pacific (6%), Canada (5%), Asia (5%), Central America (4%), Caribbean (3%) and Mexico (3%). Of the 32.2% of respondents that specified their gender (67.8% not specified), 49.5% were male (50.5% female). Similarly, of the 30.1% of respondents that disclosed their age (69.9% undisclosed), the median age was 35-49 years. The mean number of previous reviews of respondents was 23.01 (s.d.=44.91), with an average of 19.50 helpful votes per review (s.d.=38.47). The mean overall satisfaction rating from the reviews was 4.16 (s.d.=1.11), whilst mean value was 4.15 (s.d.=1.14) and mean service quality was 4.32 (s.d.-1.09).

3.2.2 Text Pre-Processing

To improve the computational efficiency of the analysis, the data were pre-processed using Python's Natural Language Toolkit (NTLK). We followed standard practice for text pre-processing (e.g. see Guo et al., 2017), removing non-English words and characters, tokenization, word stemming, part-of-speech tagging, and replacing typical negative words.

3.2.3 Dictionary Creation

A dictionary of terms was created by collecting and compiling synonyms associated with the types of hotel customer-employee encounter experience value based on: personalization, flexibility, co-creation, emotions, and knowledge and learning. Dictionary items were also developed for mentions of employees. The dictionary was then extended using the WordNet functionality in WordStat 8.0 (Provalis Research, 2019). Additional sentiment dictionaries for positive and negative words were adopted from WordStat Sentiment Dictionary 2.0. In total, 15,686 words were included in the dictionaries. Table 1 shows the distribution of words in the different concept dictionaries, along with examples. The number of words for personalization, flexibility, co-creation, emotions, and knowledge and learning ranged from 189 for flexibility to 1014 for emotions. Except for emotions, most concepts were around 200 words.

*** INSERT TABLE 1 ABOUT HERE ***

3.2.4 Text Analytics of Review Data

We content analysed the reviews using WordStat 8.0. This resulted in variables being created for: the number of instances mentioning employees and the five types of employee interaction, positive words and negative words. Figure 2 shows the proportion of non-empty reviews mentioning particular keywords. A total of 56.27% of cases (including keywords) mentioned employees in reviews. Emotions and co-creation were mentioned in 56.32% and 52.48% of cases, but knowledge and learning, flexibility and personalisation in a smaller proportion of cases (35.22%, 23.63% and 15.46% respectively.

*** INSERT FIGURE 2 ABOUT HERE ***

As we can see from Figure 2, there were slightly more non-empty cases with positive words (96.38%), than negative words (86.36%). Positive and negative words were used to calculate the overall sentiment in a review, given by $s=(p-n)/(p+n)$, where p are positive words and n are negative words. The data suggested that hotels with a higher star class had a greater frequency of positive words and a lower frequency of negative words (per 10,000 words), adding face validity to the data set (see Figures 3 and 4).

*** INSERT FIGURES 3 AND 4 ABOUT HERE ***

3.2.5 Final Data Preparation

In this study, we are interested in whether a particular type of employee interaction occurred during a tourist experience, rather than the number of text mentions, and therefore we created binary variables for the five constructs and employee interaction. If there was a mention of an employee in a review, employee interaction was coded at 1, else it was coded as 0. If a hotel customer-employee encounter experience value was mentioned in a review, the data was recoded as 1 for that type of experience value, 0 otherwise. We then developed an employee interaction variable for each of the five constructs by multiplying them by the binary employee interaction variable. Thus, each review would now register 1 if a particular type of hotel customer-employee encounter experience, such as personalization, was mentioned, and 0 if not. Finally, we converted the polarity measures for sentiment for each review into integers (thus if greater than 0 it became +1, if less than 0 it became -1), creating a +1/-1 polarity variable, which was then used to add valence to the employee interaction constructs.

The variables from the text analytics and related variables associated with each review were combined into a single file for further analysis. Additional variables included consumer ratings for service quality, satisfaction and value.

3.2.6 Inferential Statistics

ANOVA tests were applied to examine differences in service quality, satisfaction and value based on whether there were positive, negative or no personalization, flexibility, co-creation, emotional, or knowledge and learning customer-employee encounter experiences. Due to heteroscadascity, we used Welch's robust ANOVA test and Tamhane's T2 post-hoc tests. In order to assess the impact of the independent variables (personalization, flexibility, co-creation, emotional, or knowledge and learning) on the dependent variables (overall satisfaction, service quality and value), we used Somers' d test (Somers, 1962). The Somers' d test excels at testing relationships between dependent and independent variables when ordinal variables are involved. This is a suitable test since both our employee interaction variables (personalization, flexibility, co-creation, emotional, or knowledge and learning) and measures of service quality (overall satisfaction, service quality and value) are ordinal.

4. Results

In this section, the conceptualisation is applied using the big data set and text analytics. We examine which types of positive and negative customer-employee interactions have the largest impact on customers' perception of service quality, satisfaction and value. First, we examine the impacts of positive and negative hotel-customer encounter experiences for the different value types using ANOVA, then we test the relationships between the five concepts and outcome measures more formally using Somers' d test.

4.1 Understanding Positive and Negative Encounter Experience Types via ANOVA

The results in Table 2 indicate significant differences between the types of employee interaction and the resulting perceptions of service quality, satisfaction and value. Each of the Welch ANOVA tests identified significant differences between type of employee interaction and the three outcomes variables at $p<.001$. The analysis demonstrated that positive customer-employee interactions of the various types led to higher overall satisfaction, service quality and perceptions of value, whilst negative customer-employee interactions led to lower overall satisfaction, service quality and perceptions of value. However, the impacts of positive and negative employee-customer interactions led to different levels of movement in the perceptions of service quality, value and overall satisfaction to that of positive employee-customer interactions, as shown in Figure 5.

*** INSERT TABLE 2 ABOUT HERE ***

*** INSERT FIGURE 5 ABOUT HERE ***

The results identified interesting differences among the particular types of employee interactions. Employee flexibility led to both positive and negative swings in perceptions of overall satisfaction, value, and service quality. Of the five constructs, flexibility had the greatest potential to reduce the outcome variables (from -0.39 to -0.52 points), and this was greater than the potential to increase perceptions of satisfaction, value and service quality (possibly as flexibility is difficulty to get right and/or is expected by customers); employee flexibility had the lowest levels observed for the three outcome variables for the negative group in Table 2 (scoring means of 3.65 to 3.88 points).

Positive emotional- and personalisation-based employee interactions significantly improve perceptions of all three outcomes (resulting in the highest levels of these variables observed, particularly for personalisation, with a 0.44 to 0.63-point increase across the outcomes), whilst negative emotional and co-creation-based employee interactions did not have such a dramatic effect, with a negligible decrease for overall satisfaction, service quality and value (-0.03 to -0.14 points). Positive co-creation- and knowledge and learning-based employee interactions led to significant improvements in perceptions of overall satisfaction, value and service quality (0.37 to 0.56 points), but poor employee encounter experiences could also lead to moderate falls in outcome variables (-0.12 to -0.26 points).

4.2 Application of the Conceptualisation to Predict Consumer Outcomes

We further used the dictionary analysis data to assess whether each of the five employee-tourist encounter experience concepts has a positive and significant association with the three visitor outcome variables. In particular, we applied the data on reviews (classified as containing positive, negative or no interaction) for each of the five concepts to test whether there is a statistically significant relationship with overall satisfaction, value and service quality. Given that the data is ordinal and contains dependent (overall satisfaction, service

quality and value) and independent variables (personalization, flexibility, co-creation, emotional, or knowledge and learning), we apply Somers' d test. The results are shown in Table 3.

*** INSERT TABLE 3 ABOUT HERE ***

Table 3 shows that each of the concepts has a positive and significant association with the outcome variables, demonstrating predictive validity for all concepts. Flexibility appears to be the most powerful driver of the outcomes, with the highest value of Somers' d for its relationship with overall satisfaction (d=0.219, p<.001), service quality (d=0.162, p<.001), and value (d=0.147, p<.001). Personalisation was significant at the 1% level in its relationship with overall satisfaction (d=0.120, p=.003), service quality (d=0.117, p=.001), and value (d=0.105, p=.008). All other relationships were significant at the 0.1% level.

There are numerous studies that utilise hotel reviews employing big data analytics, but our study is the first to examine the impact of customer-employee experience value on customer satisfaction, value and service quality using a text analytics approach. Our research supports the key conceptualisations in our research model. However, we unexpectedly find that particular types of employee interaction are much more powerful in influencing customer perceptions, particularly flexibility, which can lead to the biggest overall (upward and downward) variations in outcome variables. Emotion and personalisation provide important and relatively 'safe' tools to improve customer outcomes, with low impacts on outcomes from negative employee interactions. Co-creation and knowledge and learning can also provide powerful levers for enhancing customer perceptions of satisfaction, value and service quality, but if done incorrectly, the impact of negative outcomes is more substantial.

5. Discussion and Conclusions

The findings of this research add to the existing body of literature on tourist-employee interaction and visitor satisfaction through the unique perspective of text analytics for five key employee interaction types (personalization, flexibility, co-creation, emotions, and knowledge and learning), based on a big data set of online hotel reviews. While previous studies have explored sentiment from hotel reviews, they did not consider these particular types of customer-employee interactions. This is important since there is a need for exploring the types of interactions which contribute to differences in perceptions of service quality, satisfaction and value as a precursor to the image held by consumers when reading the reviews. This research also makes a contribution through its development of a valid and reliable scale and a customer-employee encounter experience value type dictionary for text analytics. The robustness of our results is supported by the huge sample size and another recent study that tests the conceptualisation using survey research (Barnes et al., 2019).

The overall assessment of our results appears to suggest that hotel customers demand flexibility above all else; positive flexibility employee-customer interactions receive significant positive improvements in customer perceptions of satisfaction, values and service, but customers are extremely sensitive to any problems in flexibility employee-customer interactions. As the highest levels of satisfaction were observed when personalised interactions between employee and customer were positive, this appears a key opportunity for hotels to boost perceptions for the three outcome variables. Emotional intelligence is another key area in which service employees can add value (Solnet et al., 2016), but where visitors are forgiving if there are problems. Similarly, poorly performed co-creation and knowledge and learning encounters experiences provide significant opportunities to raise perceptions of satisfaction and other outcomes, with only low to moderate falls in satisfaction, value and service quality perceptions for poor encounter experiences. Involving customers to develop

better, unique, individual experiences can significantly improve visitor outcomes (Zátori, 2016).

The results suggest that companies may improve their encounters by developing different dimensions, or a mix of dimensions, of encounters. Whether and how to do this will also be context-dependent and related to the strategies of the companies. Additionally, it will depend on the characteristics of the companies' tourists. The main purpose of employee-tourist encounters is for the company and its employees to assist the tourists' creation of "Experiential Value in use" (c.f. the Service-Dominant Logic paradigm, e.g. see Grönroos & Voima, 2013). Thus, the results of the conceptualisation when applied in a given company should be interpreted in the given context and improved encounter strategies developed accordingly.

We plan to enable firms to apply the dictionary analysis discussed in the paper; the application of the conceptualisation using existing review data from visitors provides a low-cost method for continuously monitoring the levels of different elements of employee-tourist interaction experiences and its impact on visitor outcomes such as perceptions of satisfaction, value and service quality. Although the conceptualisation has wider applicability, the dominant focus of the research reported here is on the hotel industry. This conceptualisation is important for hotel managers who are designing their customer relationship strategies. Regular studies employing the conceptualisation using user-generated content would enable brand managers within organisations to understand the impact of employee-customer interactions on patron satisfaction and to identify the most prominent factors contributing to dissatisfaction, aiding targeting specific factors to leverage improvement. This can be used to examine the success of different company initiatives to improve perceptions, e.g. through training or new experience products. The conceptualisation is a tool that can inform companies and in combination with other knowledge help to set new directions for development.

The conceptualisation can potentially be applied in other companies, sectors and destinations for both practical (strategic) and research purposes. Further studies discussing more deeply the contextual conditions as well as the strategic conditions and implications of findings based on the conceptualisation can provide more knowledge about the importance of tourist-employee encounters for improving tourists' experiences. This will provide knowledge of importance for both practice and research. Additionally, further analyses of the importance of differences between segments for the role of different encounter dimensions and their improvement potential, is relevant for furthering our understanding of employee-tourist encounters.

The study has several limitations. The research is based within an English language context, and thus the results may not be generalisable beyond this context. The distribution of the hotels is dominated by North America and Europe, which could potentially limit the generalizability of the findings. This research used an online review website to represent the customer reviews; however, it would also be useful for a future study to consider platforms such as Twitter, YouTube, Facebook, blogs, and other emergent social media channels. In this study, we analysed hotel satisfaction at scale based on an online channel; in reality, this may differ to how hotel satisfaction in the offline world is perceived. Hence, it would be useful to conduct further qualitative research to see how hotels are developing their customer interaction strategies and the relationship between offline and online satisfaction. Moreover, additional research needs to be done to further understand how different tourist-employee encounter dimensions impact tourists' experiences in different types of tourism companies, in different tourism sectors, as well as in different geographical contexts.

Credit Author Statement

Stuart J. Barnes: Data curation; Conceptualization; Software; Methodology; Visualisation; Formal analysis; Resources; Supervision; Project administration; Investigation; Writing – original draft; Writing – review and editing.
Jan Mattsson: Conceptualization; Methodology; Investigation; Resources; Writing – original draft; Writing – review and editing.
Flemming Sørensen: Conceptualization; Methodology; Investigation; Resources; Writing – original draft.
Jens Friis Jensen: Conceptualization; Methodology; Investigation; Resources; Writing – original draft.

Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Figure 1. Summary of Research Process.

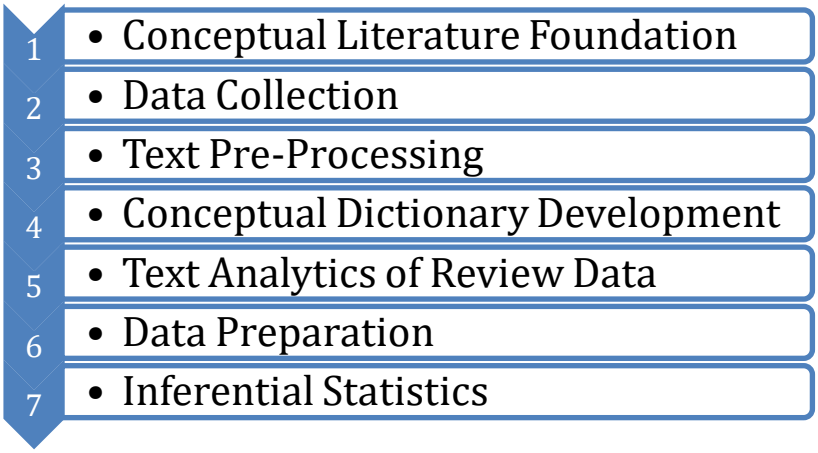

Figure 2. Distribution of Keywords (% of Cases): Hotels.

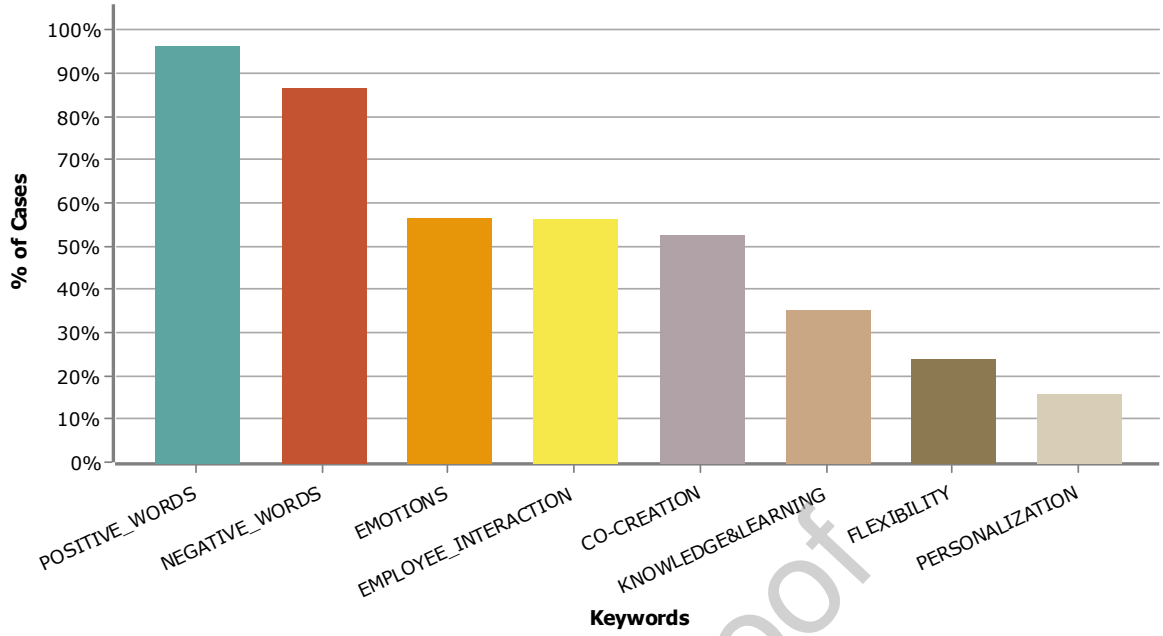

Figure 3. Negative Words – Rate per 10,000 words by Star Class (Hotels).

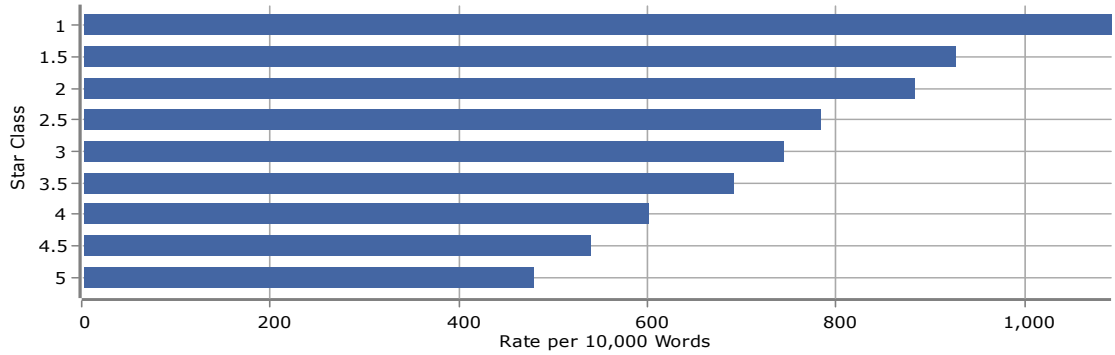

Figure 4. Positive Words – Rate per 10,000 words by Star Class (Hotels).

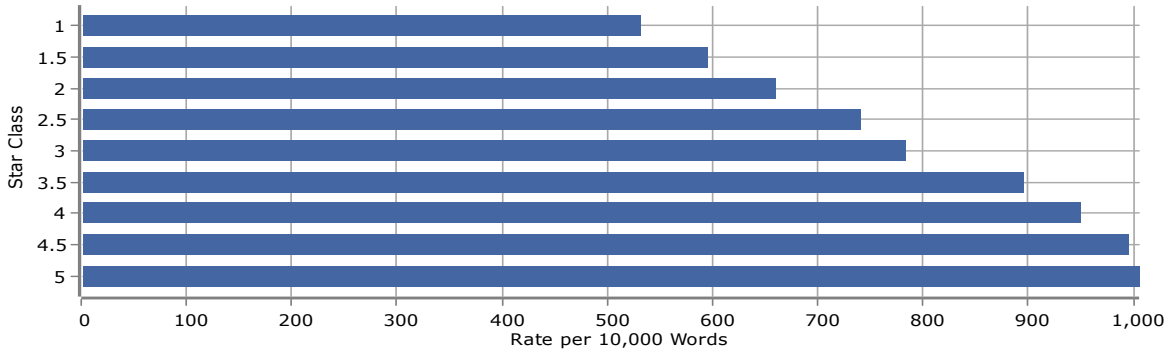

Figure 5. Impacts of Positive and Negative Encounters of Different Experience Types.

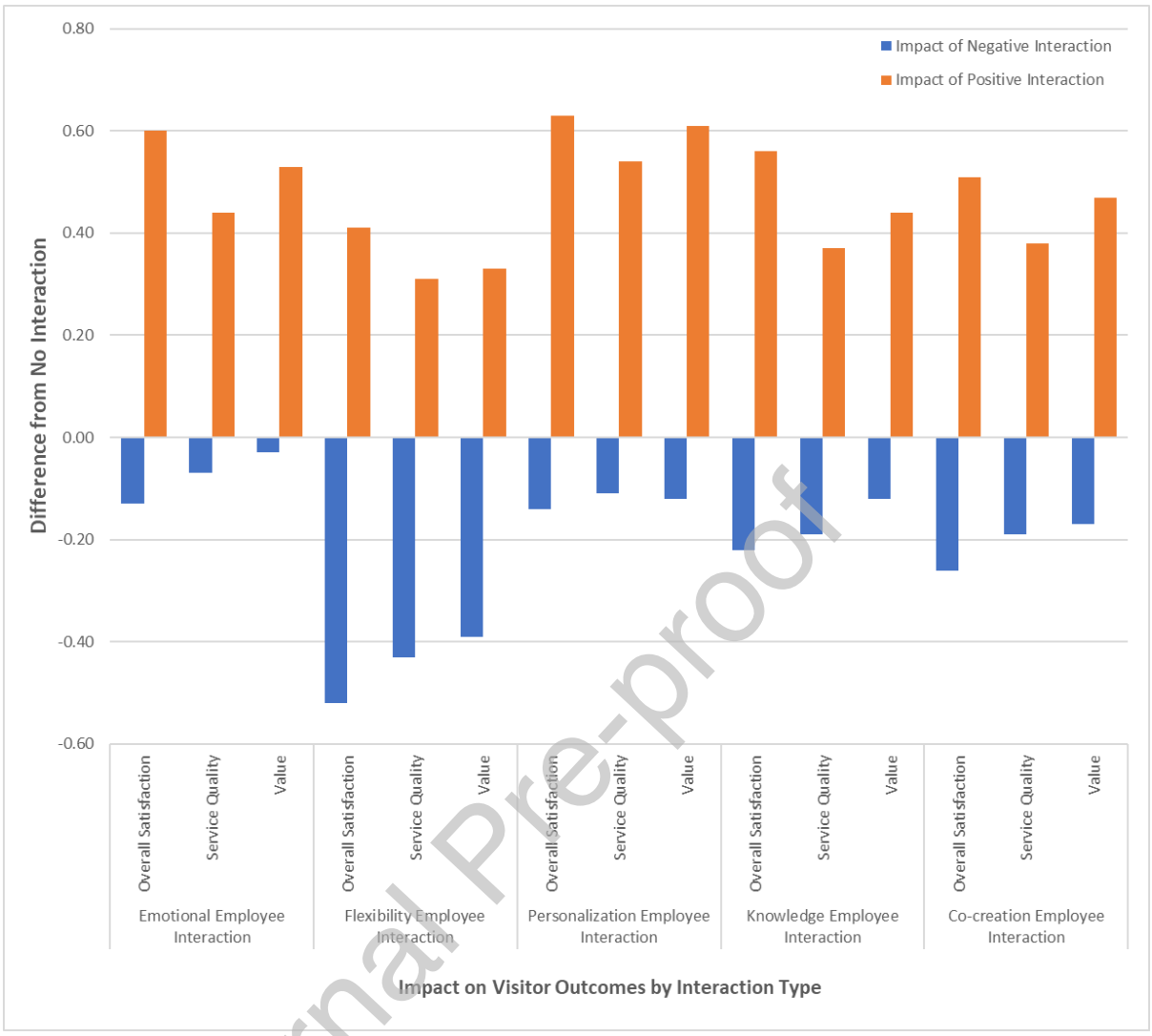

Table 1. Concept Dictionaries and Examples.

Concept	Example Dictionary Items
Personalised (257 words)	authentic, benevolent, candid, characteristic, charming, dedicated, exceptional, genuine, honest, individual, original, reliable, special, trait.
Knowledge & Learning (237 words)	discern, discover, educate, expertise, illuminate, illustrate, informed, insightful, know-how, profound, subjective, teach, understanding.
Emotions (1014 words)	affected, amazing, blissful, cheerful, concern, exhited, feeling, grin, joy, humour, lighthearted, painful, shocked, simper, smiling, warmth, worried.
Flexibility (189 words)	adaptive, amenable, compliant, consent, customize, doable, modify, obliging, open-minded, responsive, shift, tailored, unrestricted, vary.
Co-Creation (226 words)	accord, amend, coaction, collaborative, constructive, develop, enhance, facilitate, harmonize, improve, join, mitigate, reorganized, share, together.
Employee Interaction (156 words)	bartender, chef, desk clerk, doorman, guard, host, hairdresser, housekeeping, maid, receptionist, security, steward, supervisor, waiter.
Positive Words (4320 words)	a cinch, affable, balmy, bonny, buddy, cuddly, easily, effective, luxury, magic, nirvana, okay, prompt, rapport, refined, shiny, terrific, yay, yummy.
Negative Words (9287 words)	abort, abrupt, absent, abyss, banished, brash, caustic, delay, deter, excuse, fiasco, futile, mangled, mishandled, no luck, oblivion, refuse, travesty.

Table 2. Assessing the Impact of Employee Interaction Types on Visitor Outcomes.

Independent Variable	Dependent Variable[a]	A. Negative	B. None	C. Positive	Welch Test[b]	Post-Hoc Tests[b]
Emotional Employee Interaction	Overall Satisfaction	4.04	4.17	4.77	329.90 (p<.001)	C>B,A***, B>A***
	Service Quality	4.24	4.31	4.75	125.00 (p<.001)	C>B,A***
	Value	4.11	4.14	4.67	146.15 (p<.001)	C>B,A***
Flexibility Employee Interaction	Overall Satisfaction	3.65	4.17	4.58	59.69 (p<.001)	C>B,A***, B>A***
	Service Quality	3.88	4.31	4.62	39.29 (p<.001)	C>B,A***, B>A***
	Value	3.76	4.15	4.48	32.33 (p<.001)	C>B,A***, B>A***
Personalised Employee Interaction	Overall Satisfaction	4.03	4.17	4.80	40.06 (p<.001)	C>B,A***
	Service Quality	4.20	4.31	4.85	22.36 (p<.001)	C>B,A***
	Value	4.03	4.15	4.76	26.90 (p<.001)	C>B,A***
Knowledge Employee Interaction	Overall Satisfaction	3.95	4.17	4.73	49.57 (p<.001)	C>B,A***, B>A***
	Service Quality	4.12	4.31	4.68	20.60 (p<.001)	C>B,A***, B>A**
	Value	4.03	4.15	4.59	20.39 (p<.001)	C>B,A***, B>A*
Co-creation Employee Interaction	Overall Satisfaction	3.91	4.17	4.68	168.22 (p<.001)	C>B,A***, B>A***
	Service Quality	4.12	4.31	4.69	88.01 (p<.001)	C>B,A***, B>A***
	Value	3.98	4.15	4.62	111.08 (p<.001)	C>B,A***, B>A***

Notes: * p<.05, ** p<.01, *** p<.001; Value, n=149,969, Service, n=261,787, Satisfaction, n=265,016; b. Welch test and Tamhane's T2 test due to heteroscedasticity.

Table 3. Assessing the Impact of Employee Interaction Types on Visitor Outcomes (Somers' d): Hotels.

Relationship	Asymp. Std. Error	Somers' d	Approx. T	Approx. P
Emotional Employee Interaction → Overall Satisfaction	0.013	0.129	9.909	<.001
Flexibility Employee Interaction → Overall Satisfaction	0.020	0.219	9.986	<.001
Personalised Employee Interaction → Overall Satisfaction	0.039	0.120	2.966	.003
Knowledge Employee Interaction → Overall Satisfaction	0.020	0.129	6.277	<.001
Co-creation Employee Interaction → Overall Satisfaction	0.012	0.158	12.466	<.001
Emotional Employee Interaction → Service Quality	0.012	0.077	6.413	<.001
Flexibility Employee Interaction → Service Quality	0.020	0.162	7.794	<.001
Personalised Employee Interaction → Service Quality	0.036	0.117	3.199	.001
Knowledge Employee Interaction → Service Quality	0.019	0.082	4.231	<.001
Co-creation Employee Interaction → Service Quality	0.012	0.103	8.715	<.001
Emotional Employee Interaction → Value	0.012	0.086	6.820	<.001
Flexibility Employee Interaction → Value	0.021	0.147	6.888	<.001
Personalised Employee Interaction → Value	0.038	0.105	2.670	.008
Knowledge Employee Interaction → Value	0.020	0.074	3.713	<.001
Co-creation Employee Interaction → Value	0.012	0.117	9.43	<.001

Note: Somers d measures the relationship between ordinal independent and dependent variables.