



# Article Leisure Motivation and Satisfaction: A Text Mining of Yoga Centres, Yoga Consumers, and Their Interactions

# Susan (Sixue) Jia

School of Business and Management, Shanghai International Studies University, Shanghai 200083, China; s.jia@shisu.edu.cn or s.jia@shisu.edu.cn.com; Tel.: +86-21-3537-2000

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Abstract: Understanding the motivation and satisfaction of yoga consumers is of critical importance for both leisure service providers and leisure researchers to enhance the sustainability of personal lives in terms of physical wellness and mental happiness. For this purpose, this study investigated 25,120 pairs of online ratings and reviews from 100 yoga centres in Shanghai, China using latent Dirichlet allocation (LDA)-based text mining, and successfully established the relationship between rating and review. Findings suggest that Chinese yogis are motivated by improving physical condition, improving psychological condition, gracing appearance, establishing social connection, and creating social isolation. In addition to teaching mainstream yoga, yoga centres also provide additional courses. From a consumer perspective, yogis are relatively satisfied with teachers, courses, and the environment, but complain about the supporting staff, membership price, and reservation service. Managerially, yoga centres are encouraged to continue attending to the motivations of yogis, specialising their guidance, and fostering strengths and circumventing weaknesses in their service. This study also contributes by verifying, elaborating on, and tentatively extending the framework of the Physical Activity and Leisure Motivation Scale (PALMS).

Keywords: yoga; motivation; satisfaction; online review; text mining

# 1. Introduction

Yoga was long studied primarily as a medical therapy that treats physical pain [1,2] and illness [3,4], as well as mental anxiety [5,6] and depression [7,8], enhancing the sustainability of personal lives in terms of both physical wellness and mental happiness. However, yoga is seldom investigated as a leisure service or business [9–12], which affects the sustainability of consumers' personal lives by fulfilling their motivation and triggering their satisfaction [13–16]. This leaves a challenging but meaningful research gap for both academic scholars and industrial practitioners especially in China, because, according to Krishnan [17], there are more than 10,800 yoga schools and millions of yoga practitioners in this country, which is quite a huge leisure service market that is yet to be effectively explored or accurately understood.

# 1.1. Yoga Styles

There are countless styles of yoga. Cramer, Lauche, Langhorst, and Dobos [18] managed to categorise yoga into 53 styles. Luckily, among them, a few styles have much greater popularity than others. The popular styles include ashtanga, Iyengar, Bikram, vinyasa, and hatha. More specifically, ashtanga yoga [19] is the physical practice involving drishti (gazing during asanas, i.e., physical poses), pranayama (long and even breathing), and bandhas (engagement of core muscles during poses). Iyengar yoga [20] descends from ashtanga yoga, but has its unique emphasis on precise structural alignment, use of props, and sequencing of poses. Bikram yoga [21] is a specific type of physical

practice, which is trademarked and strictly standardised across instructors and studios. Vinyasa yoga [22] is a more vigorous style of yoga and requires the subject to move continuously through poses versus holding poses. Hatha yoga [23] incorporates the body, the physical part of a man; the mind, the subtle part; and the element that connects the body to the mind in an intricate way, the breath.

In addition to the above mainstream styles of yoga that mostly consist of posture control and manipulation of respiration, there is a different branch of yoga which focuses on mental and spiritual mastery, called raja yoga [24] or rajyoga [25]. Rajyoga meditation concentrates on the inner workings of the mind and uses a psychological approach that triggers the transcendence of the individual from body-conscious to soul-conscious [24,25].

Faced with such diversified yoga repertoire, yoga practitioners carefully make their choices. According to Penman, Cohen, Stevens, and Jackson [26], for Australian yogis, 61% of the time was spent practicing asana and vinyasa, with the other 39% was spared to the gentler practices of relaxation, pranayama, and meditation. Telles, Sharma, Singh, and Balkrishna [27] later found that the choice of yoga technique differs among nations and between age groups. Whichever their choice, it is reasonable to believe that the style of yoga a yogi adheres to is highly associated with his or her motivation of yoga practice.

#### 1.2. Yoga Guidance

By definition, yoga does not necessarily have to be practiced in a classroom; it can be performed at home with the help of books, audiovisual tools, or on the basis of one's memory and knowledge of the subject [28]. However, when a yogi comes to a yoga centre, he or she is more or less looking for guidance from a teacher. Park, Riley, Besedin, and Stewart [29] developed the Perceptions of Yoga Teacher Questionnaire (PYTQ), to quantitatively evaluate the guidance of yoga teachers. PYTQ has 13 items [29], covering basic movement teaching (e.g., teaching asana alignments and modifications), advanced skills teaching (e.g., teaching ujjayi breath, and deep breathing), and charisma (e.g., showing love and compassion).

In addition to the PYTQ wish list, yoga teachers are further expected to keep records on individual students' sessions [30], transforming from teaching technical, repeated, rote knowledge towards communicating the deeper truths about the care of the self [31], and updating themselves regularly with academic papers [32]. Overall, these existing criteria are thorough enough to direct systematic assessment of the yoga guidance investigated in this study.

Understanding yoga as a leisure service requires studying yoga from the consumer perspectives, because the nature of the service is fulfilling consumer needs. At least three major issues are involved in a consumer-oriented leisure study. The first issue is motivation, i.e., the reasons why consumers seek leisure services. A yoga consumer wishing to keep physical fitness [33] surely needs to be served at least somewhat differently from another consumer looking for social engagement [34]. The second issue is execution, i.e., the actual leisure service delivered by the service provider and perceived by the consumer, which often involves trainer, reliability, understanding, facility, courtesy, and accessibility [9]. The third issue is satisfaction, i.e., whether and why the consumers are happy or unhappy with the provided service. A yoga service provider will embrace great business success if it can correctly understand consumers' motivation, carefully execute the service protocol, and precisely detect consumers' satisfaction. Unfortunately, to the author's knowledge, there is no previous study that systematically incorporates all these three factors and synthetically generates business insights.

In order to study yoga consumer motivation, service execution, and consumer satisfaction, one needs to obtain and process consumer information. Among the various ways of obtaining and processing consumer information, user-generated content (UGC) analysis has its unique advantage of being extensive and unobtrusive. UGC refers to the information generated on blogs, social networking sites, etc. by individual internet users, instead of by official media or companies [35]. UGC can take the forms of TripAdvisor hotel reviews written by real travellers [36], YouTube videos uploaded by altruistic videographers [37], or Wikipedia entries edited by collaborative authors [38]. By analysing

the great volume of UGC readily available on the internet, one can discover motivation, execution, and satisfaction knowledge based on massive consumer sampling (extensive) without bothering a single consumer (unobtrusive).

Based on the above research gap which calls for clearer elucidation of yoga consumers' motivation and satisfaction in China's leisure market, as well as the availability of online UGC that may carry potential answers, this study aims at uncovering why Chinese yoga consumers come to yoga centres and whether they enjoy the leisure time there, by means of analysing the online content they generate on the internet. The significances of this study are twofold. On one hand, it explicitly addresses the influential factors that motivate yoga practice and determine yoga consumer satisfaction, offering valuable service improvement suggestions to yoga service providers, thus contributing to this specific leisure service sector. On the other hand, it establishes a standardised and cost-effective protocol of mining the massive consumer data available online, which is readily transferable to other leisure service businesses.

This study is structured as follows: Section 2 provides a thorough retrospect of previous literature regarding text mining, yogi motivation, and yogi satisfaction, which forms the theoretical and methodological foundation of this study. Section 3 illustrates the technical detail of UGC data selection, acquisition, and text mining. Section 4 reports the statistical, semantical, and correlational facts, whereas Section 5 reciprocates with theoretical interpretation and managerial implication. Finally, Section 6 revisits the key findings and closes with limitations and future study suggestions.

#### 2. Literature Review

#### 2.1. UGC Analysis

Online rating and review are two of the most typical forms of UGC [36]. Rating, usually based on a five-point scale, quantitatively tells whether and to what extent a customer is satisfied with the provider [39]. Unlike rating, review is a piece of textual comment, which describes the experience of the customer with the provider in a qualitative manner [40]. Studied together, rating and review can construct a complete depiction of customer response and can synergistically maximise research effectiveness [41,42]. In the meantime, the advancement in text mining technology increased the odds of automatically recognising the major themes in the reviews on which the users are writing [43]. Latent Dirichlet allocation (LDA), a state-of-art thematic modelling tool, is both capable and suitable to perform the topic identification task [44], such that a qualitative review is thereby quantifiable by counting the mentioning of topics within [45,46]. See Table 1 for a summary of the characteristics of UGC analysis in investigations [47].

Characteristics	References								
Characteristics	Ye et al. [36]	Anderson et al. [39]	Lee et al. [40]	Büschken et al. [41]	Hao et al. [42]	Miller et al. [43]	Gosh et al. [45]	Liu et al. [46]	This Research
Online rating	$\checkmark$			$\checkmark$					
Online review	-								
LDA	-		,	v			v V		
Topic frequency	-		$\checkmark$		-				

**Table 1.** Characteristics of user-generated content (UGC) analysis in investigations. LDA—latent Dirichlet allocation.

An important benefit of UGC analysis is that researchers are now able to detect user motivation in an unobtrusive way [48], which is sometimes referred to as netnography [49]. For example, Wang and Zhai [50] uncovered the two major types of motivation for entering online chat groups, i.e., acquisition of knowledge and sense of belonging, by analysing the chat messages without directly asking the chatters. Likewise, Felix [51], Liang et al. [52], and Xiao [53] all successfully recognised users' motivation from their textual expressions. The correlation of customer review with rating, enabled by the quantification of textual review, can also generate additional findings regarding customer satisfaction. For example, Büschken and Allenby [41] correlated the frequency of customer review topics with rating using multi-linear regression. According to this study, if the coefficient of the frequency of a topic (e.g., pizza) is positive, the customers are relatively satisfied with it, because the more frequent mentioning of this topic will lead to a positive increment of rating. Similarly, Hao et al. [42] successfully told satisfactory topics from unsatisfactory ones by comparing the appearance of topics in association with positive and negative ratings. In other words, one can now discover not only whether the consumers are happy or unhappy, but also why they are or not, which provided an important methodological foundation for this study. See Table 2 for a summary of the purposes of UGC analysis in investigations [47].

	References							
Purposes	Wang et al. [50]	Felix [51]	Liang et al. [52]	Xiao et al. [53]	Büschken et al. [41]	Hao et al. [42]	This Research	
Motivation	$\checkmark$	$\checkmark$	$\checkmark$		-	-	$\checkmark$	
Satisfaction	-	-	_	_	$\checkmark$	$\checkmark$	$\checkmark$	

Table 2. Purposes of UGC analysis in investigations.

#### 2.2. Yogi Motivation

Integrating existing yogi motivation studies into the framework of PALMS [54], one can get a clearer overview. PALMS refers to Physical Activity and Leisure Motivation Scale, a scale developed by Zach et al. [54] to measure motivation for physical leisure activities. The sub-scales of PALMS include mastery, physical condition, affiliation, psychological condition, appearance, health professionals' and employers' expectations, family and friends' expectations, enjoyment, and competition or ego [54].

Although PALMS was not tailored for yogi motivation study, it perfectly incorporates the major reasons for yoga practice reported in successive studies, encompassing healthy body [55], more active lifestyle [56], physical fitness [33], better appearance [57], stronger control of emotion [58], personal mental growth [59], feeling like part of a community [60], and social engagement [34]. The only thing missing from PALMS seems to be spirituality related appeals [61], which may be explained by PALMS focusing on physical activities whereas spirituality is highly mental. Nevertheless, PALMS provided an excellent referential framework for the motivation analysis of this study.

## 2.3. Yoga Service and Yogi Satisfaction

As mentioned earlier, yoga was rarely viewed as a leisure service or business in previous studies. Consequently, literatures regarding yogi satisfaction can unfold only from yoga practitioner perspectives instead of through a yoga consumer lens. Yoga practitioners' satisfaction results from improved physical and mental health [62], body image promotion [63], enhanced sexual function [64], and consequent better quality of personal and professional life [65–67]. Moreover, Hoyez [68] investigated the effect of therapeutic landscape on yogi satisfaction, which is mediated by sense of holiness, emotional qualities, intimate feelings, health, and wellbeing. However, all these explanations taken together still may not fully account for the reason why a consumer is satisfied or not in a yoga centre. The missing service-related factors are exactly what this paper aims to address.

#### 3. Methods

## 3.1. Research Questions

In consideration of the above status quo of yoga research, the three research questions (RQs) of this study are thereby clearly stated as follows:

RQ1: What are the motivations of Chinese yogis? Previous studies justified PALMS [54] as a benchmark instrument to understand leisure motivation. This study would, on one hand, uncover

Chinese yogis' motivation using UGC analysis, and, on the other hand, interpret the findings with reference to PALMS.

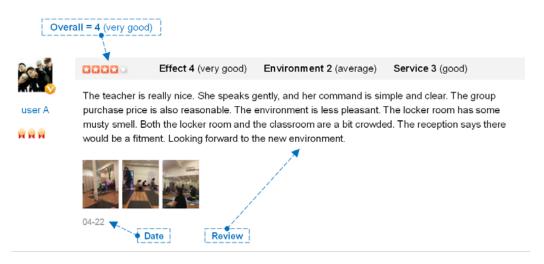
RQ2: How is yoga service actually executed in China? Although yoga service flourished in China, the fact that yoga is a recently imported leisure from foreign countries suggests that the understanding and teaching of yoga may contain some Chinese complexion, which can be very different from the situation in countries of richer yoga traditions based on which most previous studies were conducted.

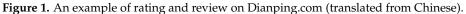
RQ3: Are Chinese yoga consumers satisfied in yoga centres, and why? As an enhancement to previous studies, this study explores yogi satisfaction from consumer perspectives. By addressing both practice- and service-related factors, this study generates extended comprehension of yoga as a leisure business.

## 3.2. Data Sampling

From Dianping.com, the largest crowd-sourced online rating and review community in China [69,70], the author randomly selected 100 yoga centres in Shanghai, a metropolitan city of China, with previous leisure studies supporting the rationale of focusing on specific geographic regions to control the spatial, historical, and cultural factors [71–73]. Each of the selected yoga centres has at least 120 pairs of ratings and reviews written by its yogis during 2006–2017. Some yoga centres may belong to the same parent company. For clarity, the purpose of this study is to make generalisations for the yoga industry, instead of promoting some companies over others.

Typically, a yogi provides the following information regarding a yoga centre (see Figure 1 for an example): (1) overall rating, a five-point scale ("5ps" for short, with 1–5 corresponding to poor, average, good, very good, and excellent), (2) effect rating (5ps), which evaluates the result of yoga practice, (3) environment rating (5ps), which evaluates the facility and atmosphere, (4) service rating (5ps), which evaluates the regular service and supporting staff, (5) review, a piece of textual comment (mostly in Chinese), and (6) the date when the information was posted. Among them, (1)–(4) are structured data that can be measured directly, whereas (5) is unstructured data that have to be analysed using text mining.





## 3.3. Topic Identification Using LDA

The LDA approach is based on the assumption of the probabilistic topic model [44], which assumes the word generation in a document as a two-stage process:

- (1) Randomly choose a distribution of topics;
- (2) For each word in the document,

- (a) Randomly choose a topic from the distribution of topics in (1);
- (b) Randomly choose a word from the corresponding distribution of the vocabulary.

In real situations, neither the distribution of topics over documents nor the distribution of words over topics is known a priori; only the documents are observed.

For example, suppose one has the following simple documents:

- The coach helps me greatly.
- Our teacher is extremely patient.
- The price is reasonable.
- The membership card is expensive, but I though it worth the price.
- The coach is nice, and the price is OK.

The LDA might produce something like the following.

- Sentence (1) and (2): 100% Topic A.
- Sentence (3) and (4): 100% Topic B.
- Sentence (5): 50% Topic A, 50% Topic B.
- Topic A: 30% coach, 20%, teacher, 10% nice, 5% patient, ... (at which point one would interpret Topic A to be about coach).
- Topic B: 40% price, 30% membership, 15% worth, 5% expensive, ... (at which point one would interpret Topic B to be about membership price).

Mathematically, the connection between hidden and observed variables is the joint distribution expressed in Equation (1).

$$p(\beta_{1:K}, \theta_{1:D}, z_{1:D}, w_{1:D}) = \prod_{i=1}^{K} p(\beta_i) \times \prod_{d=1}^{D} p(\theta_d) \times \sum_{n=1}^{N} p(z_{d,n} | \theta_d) p(w_{d,n} | \beta_{1:K}, z_{d,n})$$
(1)

- $\beta_i$  Distribution of word in topic *i*, altogether *K* topics;
- $\theta_d$  Proportions of topics in document *d*, altogether *D* documents;
- $z_d$  Topic assignment in document *d*;
- $z_{d,n}$  Topic assignment for the *n*th word in document *d*, altogether *N* words;
- $w_d$  Observed words for document *d*;
- $w_{d,n}$  The *n*th word for document *d*.

The identification of topics and words is, thus, a posteriori estimation (Equation (2)) using Gibbs sampling [74]. In this study, the estimation was realised using Python LDA 1.0.5 [75].

$$p(\beta_{1:K}, \theta_{1:D}, z_{1:D} | w_{1:D}) = \frac{p(\beta_{1:K}, \theta_{1:D}, z_{1:D}, w_{1:D})}{p(w_{1:D})}$$
(2)

## 3.4. Word Frequency Analysis

Usually, word frequency analysis is acquiescently and implicitly performed during the LDA-based topic identification, with high-frequency words clustered to form topics. One shortcoming of this algorithm is that, for words that are of high importance but appear fewer times, they could be ignored by LDA. In view of this shortcoming of LDA, the author incorporated an additional process of word frequency analysis which exclusively focused on the six major types of yoga, namely ashtanga, Iyengar, Bikram, vinyasa, hatha, and meditation.

#### 3.5. Topic Frequency Analysis

LDA can help identify the factors that yogis most care about regarding the service they receive [41–43,45,46]. However, LDA alone does not tell how these factors are associated with satisfaction. Therefore, it is necessary to establish the relationship between review and rating, creating a bridge that links the factual data (i.e., reviews) with attitudinal data (i.e., ratings).

To explore the rating–review relationships, topic frequency analysis was employed to tell positive topics from negative ones [42]. More specifically,  $WOT_i$  was defined as the weight of topic *i* in a document, which is calculated by Equation (3).

$$WOT_i = \frac{t_{i,d}}{\sum_i t_{i,d}} \tag{3}$$

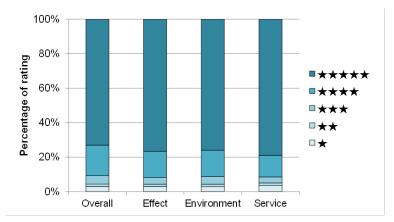
 $t_{i,d}$  Number of times a word in document *d* is allocated to topic *i*;  $\sum_i t_{i,d}$  Number of words in document *d*.

Moreover, the weights of topic *i* being mentioned in higher overall rating reviews (3–5 points)  $WOT_i^H$  and in lower overall rating reviews (1–2 points)  $WOT_i^L$  were calculated. Let  $WOT_i^{H-L} = WOT_i^H - WOT_i^L$ . Then, positive  $WOT_i^{H-L}$ , the significance of which is determined by analysis of variance (ANOVA), indicates the topic is more heavily mentioned in higher-rating reviews, suggesting the yogis are more satisfied with topic *i*.

#### 4. Results

#### 4.1. Rating Distribution

From Dianping.com, 25,120 pairs of ratings and reviews of 100 yoga centres in Shanghai, China were obtained. Figure 2 describes the distribution of ratings. The four ratings have reasonably similar distribution patterns, with around 77% five stars, 15% four stars, 4% three stars, 1% two stars, and 3% one star. The existence of a significant fraction of lower rating provides chances to pinpoint factors that lead to customer dissatisfaction.



**Figure 2.** Distribution of ratings (e.g., around 74% of yogis gave five stars to the overall performance of yoga centres).

#### 4.2. Topics Identified Using LDA

With the help of LDA, 15 topics were identified and are summarised in Table 3, followed by the top 10 words for each topic. While the words were automatically categorised into topics, the name of each topic was manually determined after analysing the words therein. Manually naming the topics is a conventional procedure in LDA-based topic identification [41–46], which was carefully performed by the author in this study. More specifically, for each topic, the author first tried selecting two words

from the top-10 word list that can form a phrase which best summarised the topic [41–46], such as "topic 9, classroom environment". If this was infeasible, the author then tried creating a phrase based on one of the words [41–46], such as "topic 12, supporting staff". If this also failed, the author finally used a related phrase that could properly describe the topic [41–46], such as "topic 4, yoga courses". The topics were arranged in such an order that topics 1–7 are more closely related to effect, topics 8–11 to environment, and topics 12–15 to service. Last but not least, it is worth noting that not every yoga style keyword was identified by LDA; only Bikram and hatha appeared on the list. The mentioning of other keywords is reported in the word frequency results.

Topic Name *	Words in	the Topic (Number	s in the Brackets	Indicate Frequency	y of Word)
1. teacher level	teacher	professional	teach	service	nice
	(24,232)	(5189)	(2582)	(2310)	(1028)
1. teacher level	kind	patient	gentle	super	lady
	(1004)	(887)	(794)	(783)	(668)
2. private teacher	teacher	patience	small class	private	effect
	(24,232)	(3170)	(2003)	(1374)	(1723)
2. private teacher	course	situation	one-to-one	excellent	aim
	(955)	(734)	(480)	(465)	(256)
3. pose correction	pose	correction	instruction	in place	posture
	(5356)	(2214)	(1647)	(1008)	(825)
5. pose correction	explain	position	careful	adjust	standard
	(675)	(641)	(576)	(564)	(273)
1	suit	aerial	night	rookie	Bikram
	(1239)	(827)	(725)	(703)	(645)
4. yoga courses	therapy	Pilates	difficulty	noon	hatha
	(612)	(556)	(550)	(357)	(209)
5. dance study	class (5640)	foundation (1722)	dance (1364)	belly dance (824)	experience (707)
	study (705)	learn (586)	jump (530)	dancing (344)	jazz (277)
	month	body shape	persist	lose weight	strive
	(1313)	(748)	(697)	(580)	(498)
6. health and fitness	cheer	expect	healthy	effort	slim
	(459)	(446)	(422)	(311)	(289)
	body	comfort	relax	stretch	work
	(2956)	(2489)	(1668)	(649)	(605)
7. body relaxation	neck and shoulder (573)	breathe (569)	mood (348)	enjoy (339)	pressure (200)
	classroom	place	warm	mat	winter
	(3852)	(3492)	(578)	(410)	(366)
8. classroom temperature	cushion (349)	hot (325)	space (287)	floor heating (272)	air conditioning (230)
9. classroom environment	environment	classroom	cosy	decoration	comfortable
	(10,118)	(3852)	(1747)	(963)	(833)
	intimate	quiet	tidy	layout	elegant
	(714)	(672)	(468)	(436)	(432)
10. bathroom	bathroom	clean	facility	bath	towel
	(1536)	(1990)	(850)	(741)	(564)
10. Dautroom	locker room	change clothes	shower	slippers	water
	(331)	(326)	(284)	(256)	(225)
	traffic	area	find	subway	road
	(1074)	(647)	(625)	(585)	(570)
11. traffic and location	location	beside	convenient	parking	park
	(560)	(401)	(211)	(208)	(202)

Table 3. Topics identified using LDA.

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Topic Name *	Words in	the Topic (Numbe	rs in the Brackets I	ndicate Frequenc	te Frequency of Word)				
12. supporting staff	zeal	front desk	attitude	boss	promotion				
	(1533)	(1548)	(1071)	(894)	(821)				
1_ oupporting out	introduce	staff	sales	reception	consultant				
	(786)	(785)	(764)	(635)	(561)				
13. free trial	free	prize	activity	thank	dine and dash				
	(1390)	(1164)	(1126)	(915)	(900)				
13. 1100 1111	twice	opportunity	happy	participate	lucky				
	(679)	(662)	(636)	(601)	(487)				
14. membership price	card	open	membership	price	year				
	(3241)	(2219)	(1723)	(1576)	(1240)				
	expensive	RMB	annual card	cheap	transfer				
	(476)	(476)	(404)	(350)	(238)				
15. reservation service	time	reservation	phone	ahead	remind				
	(2445)	(2419)	(815)	(708)	(476)				
	WeChat	actively	timetable	late	confirm				
	(426)	(405)	(277)	(275)	(184)				
	(420)	(403)	(277)	(275)	()				

Table 3. Cont.

\* All topic names were determined by the author.

# 4.3. Yoga Style Word Frequency

As was expected, some of the yoga style keywords were not identified by LDA because of their relatively less frequent appearance. Fortunately, word frequency analysis can fill the gap. Figure 3 compares the mentioning of these keywords in all the obtained reviews. Bikram was mentioned 645 times in all the reviews, much more than other yoga styles. Ashtanga and vinyasa put together gained 263 mentions. The reason for combining ashtanga and vinyasa is that they were both translated to "flow yoga" in the Chinese language. Hatha was mentioned 209 times. Meditation and Iyengar were less frequently mentioned.

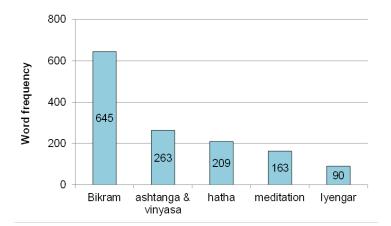
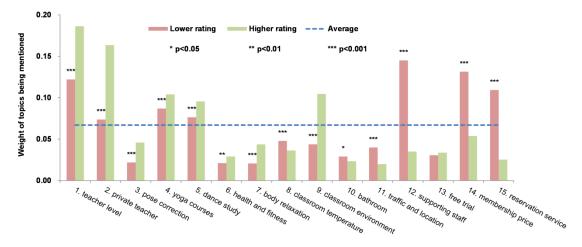


Figure 3. Yoga style word frequency (e.g., Bikram was mentioned 645 times in all the reviews).

# 4.4. Weight of Topics Being Mentioned

The weights of the topics being mentioned in higher- and lower-rating reviews are shown in Figure 4. In the figure, each green bar represents the weight of the corresponding topic being mentioned in a higher-rating review, while a red bar indicates one being mentioned in a lower-rating review. The difference of the two weights was statistically tested with the *p*-value from the ANOVA given. A larger positive difference ( $WOT_i^{H-L}$ ) corresponds to greater satisfaction. An average weight of 6.7%, which supposes even distribution of the 15 topics, was labelled for discussion purposes.



**Figure 4.** Weight of topics being mentioned in higher- and lower-rating reviews (e.g., in lower-rating reviews, around 15% of topics are about supporting staff, which is much higher than in higher-rating reviews, i.e., around 3%).

# 5. Discussion

#### 5.1. Yogi Motivation

The topics and words in Table 1 were compared with the items of PALMS [54] to jointly disclose the motivation of Chinese yogis in yoga centres. The major motivations, expressed using PALMS terms, include improving physical condition, improving psychological condition, and gracing appearance. For physical condition, the yogis reported the "comforting" of "neck and shoulder". For psychological condition, the yogis mentioned the "relaxing" of "mood". Regarding appearance, the yogis "cheerfully" said they "lost weight" and achieved "slim body shape". Moreover, two other items of PALMS, namely mastery and enjoyment, though not explicitly identified using LDA, are also believed to be motivations of Chinese yogis.

The subsequent items discussed are not the motivations of Chinese yogis in yoga centres. Firstly, these yogis are not under health professionals' or employers' expectations. In other words, their yoga practice is neither prescribed by doctor or physiotherapist, nor for the purpose of managing a medical condition. This is reasonable because the yoga centres investigated are positioned to be leisure service providers instead of medical institutions. Secondly, the yogis are not under family or friends' expectations to earn a living. Thirdly, there is no competition involved in the studied yoga practice.

Affiliation, the remaining undiscussed item of PALMS, is worth detailed examination. Yogis, as other leisure practitioners, are believed to be socially motivated as they are constantly seeking social identification [76], social connection [77], and social interaction [78]. As one of the yogis commented,

"I was in a small class where I had a good relationship with the teacher and the classmates. The classroom was finely decorated, warm, and sweet. The teacher would design different poses for us and arrange formations. Real fun. We had a special class member, Ms. Cat, who came to visit us time and again. Every one enjoyed the course and we are still connected on SNS."

## (user ID: shadow\_and\_sand)

While some yogis are eager for social connection in a yoga centre, a few others are seeking temporary social isolation instead. Hoyez [68] proposed a yoga site as a place adjusted for urban residents' need for a small island of peace and serenity in the midst of urban life. Because yoga was proven to reduce anxiety [5,6], it is not surprising that yogis wish to enhance its tranquillising function by temporarily isolating themselves. As one yogi wrote,

"Yoga is associated with quietness and comfort. After a full day of fast-tempo work during which I had to communicate with numerous people, it was nice to calm myself down and enjoy the tranquillity. I

was stretching every part of my body, drenched in sweat. The coda of the course was perfect, with music slowed and light dimmed. Fully relaxed."

# (user ID: judy\_zhangqi)

The dual social functions of yoga (i.e., social connection and social isolation) are derived from the fact that yoga can be both a serious self-cultivation and a sociable hobby. Leveraging this unique advantage of yoga over other leisure practices, yoga centres are able to provide yogis the chances of either enhancing or complementing their current social state.

#### 5.2. Yoga Service Execution

The core service of a yoga centre is definitely yoga course teaching. Judging from the yoga style word frequency results in Figure 3, it can be seen that the mention of specialised yoga style terms in online reviews is quite infrequent. To be more specific, all five terms (i.e., Bikram, ashtanga/vinyasa, hatha, meditation, and Iyengar) put together take up 1370 times of mention in as many as 25,120 reviews. In other words, more than 95% of the reviews do not mention any of these terms. This is not to say that Chinese yoga centres do not tell one yoga style from another. It simply reflects the current situation that a large fraction of Chinese yogis are not accustomed to applying these yoga terminologies. This may also suggest that, during yoga teaching, emphasis is not directed to the articulation of the definition and comparison of different yoga styles.

In addition to teaching mainstream yoga, the studied yoga centres provide additional courses, including aerial yoga, dances, and Pilates. Aerial yoga is the practice of yoga on a hammock, which incorporates the effect of gravity and is regarded as a more interesting and interactive style of yoga. Dance class, such as jazz or belly dance, is less requiring than mainstream yoga in terms of posture and breathing. Pilates is for the purpose of elevated muscle functions. The inclusion of these multiple types of courses into the traditional yoga syllabus is helping yoga centres attract more consumers and even steal consumers from other leisure service sectors such as fitness clubs.

Regarding yoga guidance, the three aspects of PYTQ [29] were all repeatedly reported by yogis in their reviews, namely basic movement teaching (e.g., "pose correction"), advanced skills teaching (e.g., "breathing" and "meditation"), and charisma (e.g., "gentle" and "patient"). Meanwhile, several advanced practices of yoga guidance such as individual record keeping [30] and academic paper reading [32] were hardly mentioned. These suggest that the current yoga guidance in Chinese meets basic standards and can be further enhanced to more professional.

Apart from yoga teaching, yoga centres also provide supporting services such as classroom maintenance, bathroom cleaning and replenishment, and reservation management. Moreover, for potential consumers, yoga centres offer free trials to encourage membership enrolment. In general, Table 1 constructed a comprehensive scheme of yoga service execution in China, based on which consumer satisfaction could be subsequently analysed.

#### 5.3. Yoga Consumer Satisfaction

The factors yogis most care about regarding their yoga practice, as well as how these factors are associated with satisfaction, can be found in Figure 4. Topics with both bars (red and green) below the blue line (average weight of topic being mentioned), e.g., topics 3 and 10, are less discussed by yogis. Yoga centres may nonetheless wish to optimise classroom temperature (topic 8) or be glad to know that their customers are relatively happy to have their body relaxed (topic 7); however, in this section, priority is directed to topics that have at least one bar over the average, suggesting their importance from the yogis' perspective.

On one hand, yogis are relatively satisfied with teachers (topics 1 and 2), courses (topics 4 and 5), and the environment (topic 9). More specifically, higher-rating comments significantly mention more about private teachers, suggesting customisation in the yoga service industry is welcomed by yogis.

Meanwhile, yogis' emphasis on classroom environment is highly consistent with existing studies regarding physical environment [78] and social environment [77].

On the other hand, the significantly negative-weight differences in Figure 4 (topics 12, 14, and 15) indicate that there are aspects where yoga centres can improve, including supporting staff, membership price, and reservation service. Supporting staff are the personnel in a yoga centre who provide services other than yoga teaching, such as receptionists, consultants, and salespersons. Membership is a usual operation mode for Chinese yoga centres which charge yogis a certain annual fee and then offer unlimited access. Reservation refers to the process of a yogi booking a course on a first-come-first-served base, because course schedules are updated monthly and the size of a class is often fixed. Obviously yoga centres allocate more resources to yoga teaching than to these non-dominant factors, resulting in the currently negative evaluation of service satisfaction. However, it is strongly recommended that yoga centres do make an improvement in these seemingly less important service issues, because they also contribute to customer loyalty [79] through customer–staff affection and customer–firm affection [80], which eventually leads to sustainable profit [81]. After all, it is always easier to earn more money from satisfied consumers.

#### 5.4. Managerial Implications

The managerial implications of this study are threefold. Firstly, yoga centres are encouraged to continue attending to the motivations of yogis. These motivations include physical condition, psychological condition, appearance, mastery, and enjoyment. It is worth noting that, while some yogis are eager for social connection in a yoga centre, a few others are seeking temporary social isolation instead. Therefore, yoga centre managers need to carefully identify each customer's social need and provide tailored service accordingly. Moreover, the status quo that most yogis are not under health professionals' or employers' expectations suggests a huge potential market for yoga centre managers in the alternative therapy and occupational health industries in China.

Secondly, Chinese yoga centres are recommended to specialise their guidance. The fact that the mention of specialised yoga style terms in online reviews is quite infrequent suggests that, during yoga teaching, emphasis is not directed to the articulation of the definition and comparison of different yoga styles. This could put these yoga centres in a disadvantageous place when yogis become further aware of the importance of expertise in yoga. Yogis could turn to alternative sources of training such as online courses. Meanwhile, yoga centre managers may also consider the advanced practices of yoga guidance such as individual record keeping and academic paper reading.

Thirdly, the yoga centres are advised to foster strengths and circumvent weaknesses. Because higher-rating comments significantly mention more about private teachers, yoga centres can, therefore, generate greater profit by investing more into customisation. The same philosophy applies to classroom environment elevation from both physical and social perspectives. Meanwhile, yoga centres need to better train supporting staff, re-evaluate membership price, and improve reservation service. Otherwise, they could lose their market share to newcomers who especially outperform in yoga customer service.

#### 6. Conclusions

Knowing the motivation of yogis and whether and why they are satisfied or not with yoga service is of critical importance for both service providers and leisure researchers to enhance the sustainability of personal lives in terms of physical wellness and mental happiness. For this purpose, this study investigated the 25,120 pairs of online ratings and reviews of 100 yoga centres in Shanghai, China using text mining, and successfully established the relationship between rating and review. Findings suggest that Chinese yogis are motivated by improving physical condition, improving psychological condition, gracing appearance, establishing social connection, and creating social isolation. In addition to teaching mainstream yoga, yoga centres also provide additional courses. From a consumer perspective, yogis are relatively satisfied with teachers, courses, and the environment, but complain about supporting staff, membership price, and reservation service.

## 6.1. Theoretical and Managerial Contributions

Theoretically, this study contributed by verifying, elaborating on, and tentatively extending the framework of PALMS [54]. The major motivations of yogis were identified as improving physical condition, improving psychological condition, gracing appearance, and generating mastery and enjoyment. In addition, affiliation, an item of PALMS, was examined in detail. It was revealed that, while some yogis are eager for social connection in a yoga centre, a few others are seeking temporary social isolation instead. The dual social functions of yoga (i.e., social connection and social isolation), deriving from the fact that yoga can be both a serious self-cultivation and a sociable hobby, is a meaningful augmentation to the PALMS framework.

Managerially, this study clearly identified the primary factors that motivate yoga practice and determine yoga consumer satisfaction, offering specific service improvement hints to yoga service providers. Meanwhile, this study established a standardised protocol of analysing the massive consumer data available online, which can be directly transferred to the research on other leisure service businesses.

# 6.2. Limitations and Future Study Suggestions

This study is not without limitations. On one hand, the samples were limited to Shanghai, China, meaning the findings and implications may not directly apply to other cities or countries. Fortunately, geographically expanding the region of interest to a larger scale is not insurmountable, thanks to the availability of online data on Dianping.com and other social e-commerce communities. This leads to the first recommendation regarding future studies that a cross-region or even cross-cultural study can be conducted to further validate the text mining method and generate more insightful findings.

On the other hand, the samples might have introduced some bias, since all the samples examined were yogis who volunteered to post ratings and reviews online, meaning those yogis who were less active online might have been neglected. In other words, it is not absolutely certain that the studied yogis are fully representative of all yogis. To further enhance the persuasiveness of the findings, it is suggested that future studies incorporate both text mining, which allows a large sample size, and in-depth interview, which helps eliminate sample bias.

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