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Crowding, Emotions, Visitor Satisfaction and Loyalty in a Managed Visitor Attraction

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ABSTRACT

The aim of this study is to examine how perceptions of crowding and emotions influence visitor satisfaction and loyalty in a managed visitor attraction. Although perceived crowding is an important indicator of experience quality, there is a lack of empirical knowledge about the relationship between perceived crowding, satisfaction, and loyalty, especially in the context of managed visitor attractions. In our study, we extend theoretical models from previous studies and apply them to a particular type of managed visitor attraction, a ski resort. A non-probability sample of 248 skiers and snowboarders responded to a retrospective online survey. The findings indicate that emotions joy and anger mediate the relationships between perceived crowding and satisfaction. The effects of crowding on loyalty are indirect and mediated by satisfaction. Differing from findings in other contexts, the effect of crowding on satisfaction did not depend on prior expectations of crowding nor on tolerance to crowding.

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KEYWORDS

Overcrowding; ski resort; visitor density; visitor attraction; visitor satisfaction


Introduction

Understanding how perceived crowding influences visitors' evaluations of their experiences and satisfaction with a tourism site is essential in tourism management. Crowding is likely to have an effect on the quality of visitors' experiences at a tourist attraction site, such as a ski resort (Fonner & Berrens, 2014; Wyttenbach et al., 2012). In the winter sports resort context, its significance has been suggested more implicitly through crowded waiting lines at lifts as an attribute to (dis)satisfaction (Matzler et al., 2008), loyalty (Alexandris et al., 2006) or as an important choice factor for recreationists (Won & Hwang, 2009).

Perceived crowding is a subjective negative evaluation of density (Stokols, 1972). Tourism researchers have, therefore, recognized perceptions of crowding as an essential indicator of the quality of tourism experience (Manning, 2011). There are, however, gaps in our knowledge of the perceived crowding in tourism management. Historically, tourism researchers have mostly studied crowding in outdoor recreation, with the primary focus

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on the experience of an unspoiled landscape (Vaske & Shelby, 2008). In recent years, however, continued rapid growth of tourist arrivals in popular destinations has given rise to public debates on problems of crowding in urban destinations (e.g., New York City, Amsterdam, Barcelona), small remote locations with seasonal demand (e.g., Lofoten islands in Norway, the Isle of Skye in Scotland), and iconic visitor attractions (e.g., Machu Picchu). Therefore, further investigation of perceived crowding in different areas of tourism management, especially in managed visitor attractions, is necessary.

Previous research on crowding has suggested a weak or non-existing relationship between crowding and visitor satisfaction (Manning, 2011). Research on consumer behavior suggests that researchers should consider both the physical environment and the social aspect of crowding when investigating the influence of crowding on satisfaction and behavior (Eroglu et al., 2001). In line with previous research in outdoor recreation, Needham et al. (2004) found that also in a more commercial tourism/recreation setting, ski resort use during the summer (attracting mainly hikers and mountain bikers), the number of other visitors encountered, and perceived crowding are important indicators of site use. Visitors at backcountry sites rated encounters as less acceptable, and visitors felt more crowded when they encountered more visitors that they found tolerable. Interestingly, visitors to a marine protected area on a commercial snorkel and dive tour felt not only more crowded when they encountered more boats than their normative tolerance but also supported more restrictive management (Bell et al., 2011). Similarly, Ziegler et al. (2019) found that visitors to a marine wildlife tourism site were more likely to perceive negative effects of tourism on the environment and were more supportive of management restrictions when they felt crowded.

Recent studies in the wildlife tourism literature that specifically address the relationships between crowding and visitor satisfaction have shown mixed results. While Bentz et al. (2015) found that crowding affected the satisfaction of divers, but not on the satisfaction of whale-watchers, Needham et al. (2018) found that snorkelers and scuba divers who encountered more snorkelers/scuba divers/boats than their norm felt more crowded, less satisfied, and more likely to not visit again compared to those who encountered less than their norm. These patterns were consistent but significant only for parts of the comparisons made in the study. A study by Ávila-Foucat et al. (2013) suggested that boat crowding in a whale-watching context affects visitor return intentions.

None of these studies, however, investigated mediating or moderating mechanisms of the relationships between crowding, satisfaction, and loyalty with continuous measures and process analysis. Although crowding has been recognized as an important indicator of the quality of experience, and its effects on tourists' and locals' experiences and behavior are important topics for visitor management to understand, theoretical knowledge of crowding in ski resorts is limited. The ski resort context is particularly interesting as it combines typical purpose-built service attraction and natural attraction characteristics.

Based on the normative and expectancy-disconfirmation theory, this study was designed to better understand the nature of the crowding-satisfaction relationship, first, by investigating which specific emotion types are evoked by crowding in a ski resort setting and whether these emotions mediate the proposed relationship. Second, the study aimed to determine whether the effect of crowding on satisfaction depends on visitors' prior expectations and tolerance to crowding. Finally, the study investigated the

influence of crowding on behavioral intentions, thereby extending the existing crowding-satisfaction model to include visitor (conative) loyalty with the locus of loyalty to the service provider. This explorative study contributes to the literature on crowding by investigating mediating and moderating mechanisms underlying the relationships between perceived crowding, specific emotions types, satisfaction, and loyalty. The findings of the study offer both methodological, theoretical, and practical implications for visitor management.

Literature review

Visitors differ in their evaluation of a given actual crowding or visitor density (Graefe & Vaske, 1987). Thus, to understand individual tourist behavior, Pearce (2011) points out that visitor management research should look beyond visitor density (to e.g., perceived crowding). Perceived crowding is a psychological, subjective, and evaluative concept (Lee & Graefe, 2003; Manning, 2011). It refers to the negative evaluation of a certain density, “a value judgment which specifies that there are too many people” (Graefe et al., 1984, p. 399) and a combination of descriptive information (density level experienced) and evaluative information (negative evaluation of density) (Vaske & Shelby, 2008). In this study we focus on individual tourists’ perceptions of crowding.

Perceived crowding and emotions

Both the physical environment and the social aspect of crowding can influence consumer satisfaction and behavior (Eroglu et al., 2001; Machleit et al., 2000). A previous study in the retail context indicated that emotions partly mediate the relationship between perceived crowding and satisfaction (Eroglu et al., 2005). The mediating role of emotions has not been investigated in the tourism management context despite their theorized relevance to the nature of the tourism experience (Kim & Fesenmaier, 2015). Some studies in outdoor recreation have reported a weak (or non-significant) correlation between crowding and satisfaction (Manning, 2011; Tseng et al., 2009). Researchers have explained this finding by arguing that crowding and its relationship with satisfaction may be highly contextual and depend on activity, place-specific characteristics, and types of experiences (Wickham & Kerstetter, 2000). Another explanation pertains to mediating processes, such as coping mechanisms. For instance, Manning (2011) suggested that satisfaction as a sole indicator of service quality may not be sensitive enough to detect undesirable changes in site conditions and that crowding may be more useful due to its close association with numbers of visitors and specificity (Shelby & Heberlein, 1987).

Satisfaction is “the consumer’s fulfillment response” (Oliver, 1997, p. 13), an evaluation that contains both cognitive and affective elements (Oliver, 1997). As expectancy-disconfirmation theory suggests, consumers make satisfaction judgments by comparing their prior expectations with the perceived product or service outcome that represents the cognitive element. The affective component (positive/negative) arising from this cognitive process also contributes to (dis)satisfaction (Oliver, 1993).

Emotions are the primary motivational system for humans and are vital for organizing, motivating, and sustaining behavior (Izard, 1977). Previous studies have suggested

a relationship between emotions and satisfaction (Oliver, 1993; Westbrook, 1987). People usually rely on some measure of recall for retrospective satisfaction judgments to influence future choices (Machleit et al., 2000). Mood states tend to bias evaluations in mood-congruent directions (Schwarz & Clore, 1983). The recall is likely to be biased by the momentary emotion associated with the recalled event or experience (Bower, 1981). The emotions visitors feel during the experience are likely to play a role in evaluations, recall, and future choices of similar trips (Machleit et al., 2000).

The nature and extent of emotions activated by perceptions of crowding may play a role in understanding the crowding-satisfaction relationship (Machleit et al., 2000). Previous studies have found that crowding decreases feelings of pleasure in service settings (Hui & Bateson, 1991) and literature suggests its relation to negative affect, tension, anxiety, and nervousness (Steg et al., 2013). In Tseng et al. (2009) study, crowding partially mediated the relationship between prior expectations of encounters with others and enjoyment, while enjoyment and safety mediated the crowding-satisfaction relationship. Positive emotions can increase in response to the visitor density of specific managed attractions and events where many visitors are expected (Kim et al., 2016).

We hypothesized that increased perceived crowding at certain visitor attractions (ski resort) would be associated with increased negative emotions and decreased positive emotions. More specifically, joy will decrease with an increase in perceived crowding due to stress associated with crowding. Interest will decrease with increased perceptions of crowding, which is consistent with goal inference theory, as interest is related to motivations and the attainment of goals (Izard, 1977).

We proposed that feelings of anger, disgust, and contempt (“the hostility triad” in Izard’s terminology) will relate to perceptions of crowding. In a ski context, recreationists are likely to have to adapt their movements and pace due to the presence of others. Furthermore, waiting longer in line for lifts may cause feelings of restraints, as it limits the time that visitors can spend on the slopes, which is the primary goal of the visit. Density can result in restrictions, frustrations, and irritability, considering that visitors must adapt and move against their wishes. Since perceptions of crowding depend on the likeability and behavior of others, it seems therefore reasonable that crowding might relate to feelings of disgust. Disgust (wanting to get away from something or someone) can, for example, be elicited by a bad smell, dirty facilities, or misbehavior (of others or that of oneself). Situations that elicit jealousy, greed, and rivalry can activate feelings of contempt (feeling of hostility and prejudice) (Izard, 1977). Skiing can be a competitive activity, and crowding can interfere with one’s goals. Sadness can occur with the experience of failure to meet objectives and continuous overstimulation, which can also relate to crowding (Izard, 1977; Machleit et al., 2000). Increased attention to the self, a decrease in interest or joy, or contempt for oneself or others can activate the feelings of shyness or shame (Izard, 1977). Guilt feelings can surface during sanctions (external or internal), misconduct, or violations of social conventions (Izard, 1977; Machleit et al., 2000). Cutting the line, blocking the way for others, or impoliteness can provoke the feeling of guilt (Machleit et al., 2000). Feelings of guilt and anger can interact in frustrating situations (Izard, 1977). Crowding can increase feelings of insecurity (Machleit et al., 2000), while fear emerges when something threatening occurs (Izard, 1977). Fear of failure increases in the presence of others as skiing requires certain skills. Fear of

accidents may also increase when the slopes are crowded. Finally, the neutral emotion of surprise emerges when something unexpected happens (Izard, 1977). When people experience more crowding than expected, they may experience increased feelings of surprise. Based on the reviewed literature, we proposed the following hypotheses:

H1. Perceived crowding will correlate positively with negative and neutral emotions and negatively with positive emotions. Specifically, we proposed that:

H1a. Anger, disgust, contempt, fear, shyness, guilt, sadness, and surprise will correlate positively with crowding.

H1b. Joy and interest will correlate negatively with crowding.

Emotions and satisfaction mediate the relationship between perceived crowding and visitor loyalty

By drawing on prior studies, we hypothesized that satisfaction would mediate the relationship between perceived crowding and visitor loyalty. Research on visitor loyalty in tourism can place the locus of loyalty with a particular business, an activity, or a place (Pearce & Kang, 2009). Customer loyalty is “a deeply held commitment to rebuy or re-patronize a preferred product or service consistently in the future” (Oliver, 1997, p. 392). Before consumers become behaviorally loyal, they go through a cognitive, affective, and conative phase. According to the theory of planned behavior, behavioral intentions are direct predictors of actual behavior (Ajzen & Driver, 1991). Conatively loyal consumers praise the business, prefer one company over others, increase the purchase behavior, increase their willingness to pay a higher price, or directly indicate that they are bonding with the firm (Zeithaml et al., 1996).

In tourism and recreation research, visitor loyalty relates to crowding through the concept of displacement (e.g., Arnberger & Haider, 2007). Tourism studies have also described the concept of place attachment (emotions or meanings visitors associate to places) as an attitudinal antecedent to visitor loyalty (Lee & Shen, 2013), which is related to crowding (Eder & Arnberger, 2012).

Prior studies have investigated the satisfaction-loyalty relationship both in general service contexts (Su et al., 2011) and specific destinations (Prayag & Ryan, 2012). There are also recent studies on visitation and satisfaction at natural attractions (Ramkissoon et al., 2013; 2018). Crowding affects shopping behavior and customers’ feeling about stores and shopping trips (Harrell et al., 1980), relates negatively to the pleasantness of the service experience (Hui & Bateson, 1991), and affects behaviors such as the desire to spend more money and time at a restaurant (Noone & Mattila, 2009). Crowding is important in determining enduring involvement and re-patronage intentions of sports stadiums (Wakefield & Blodgett, 1996), and it has been found to affect approach-avoidance responses in the restaurant context (Hwang et al., 2012). More recently, Ávila-Foucat et al. (2013) linked vessel crowding to visitor return intentions in a whale-watching tourism context. Both, Bentz et al. (2015) and Needham et al. (2018) studied wildlife tourists in marine environments and found support for the relationships between crowding, satisfaction, and displacement. However, the results were mixed and included some insignificant findings. Based on the literature, we proposed the following hypotheses:

H2a. Higher levels of crowding will be associated with lower levels of satisfaction and loyalty.

H2b. Emotions associated with the skiing experience will partially mediate the relationship between crowding and satisfaction.

H2c. Satisfaction will mediate the relationship between crowding and loyalty.

Expectations of crowding and tolerance to crowding moderate the crowding-satisfaction relationship

Expectancy theory suggests that people are consciously or subconsciously motivated by a desire to satisfy multiple expectations or reach various psychological states when they engage in recreational activities (Lee & Graefe, 2003). Expectations (and norms) depend on individual and situational factors (individual's environment, previous experience, personality, situational factors, and information communicated by others or media). Recreationists who encounter more contacts than they prefer are likely to report that they felt crowded (Ditton et al., 1983) as also demonstrated by Bell et al. (2011) and Needham et al. (2018). When people evaluate an attraction site as crowded, they have already implicitly compared their experience with their perception of a standard, meaning that the experienced conditions exceeded their standards or norm (Vaske & Shelby, 2008). Using data collected from six areas and 3,000 respondents engaged in three different activities, Shelby et al. (1983) found a steep increase in the variance explained in perceived crowding (from 5% to 19%) when in addition to actual contacts, preferences and expectations for contacts were included as explanatory variables in the model. Machleit et al. (2000) indicate that the crowding-satisfaction relationship is moderated by prior expectations of crowding and tolerance to crowding in the retail setting. Therefore, we proposed two additional hypotheses:

H3a. Prior expectations of crowding will moderate the crowding-satisfaction relationship.

H3b. Visitors' tolerance to crowding will moderate the crowding-satisfaction relationship.

Figure 1 depicts the conceptual model of the study.

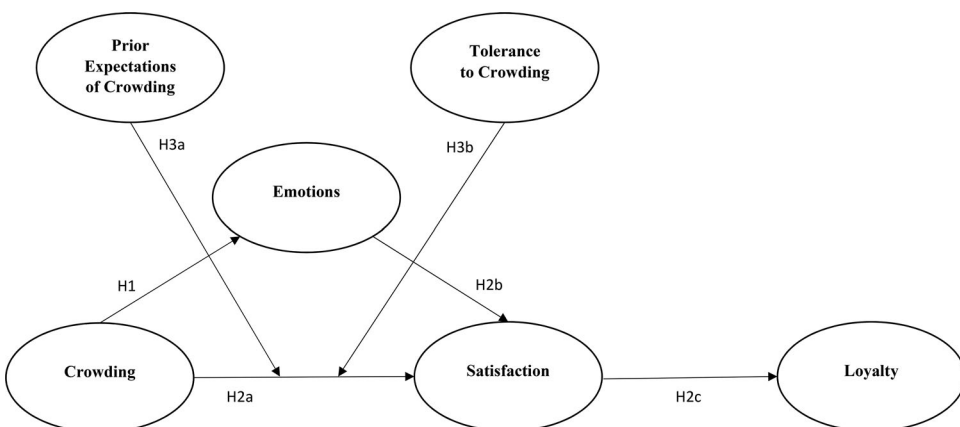


Figure 1. Conceptual model.

Method

A descriptive research design, adapted and extended from Machleit et al. (2000), was used in this study. The unit of analysis was a single visitor's experience to a small-scale ski resort in Norway. To test our hypotheses, we conducted a field study and collected data through a cross-sectional survey.

Participants and procedure

Due to limited resources and time, we asked a sample of skiers and snowboarders at Sirdal Skisenter in the southwest of Norway in February/March 2016 to fill out a retrospective online questionnaire. Non-probability sampling was considered appropriate since the primary aim of this explorative study was to investigate mediating and moderating mechanisms underlying the relationship between crowding, emotions, satisfaction, and loyalty.

The reasons for choosing this resort were its accessibility and small size with opportunities for crowding. An overview of the number of visitors by sold tickets, the number of completed questionnaires on the days of data collection, and data collection procedures are presented in Appendix A.

In total, we collected 387 email addresses, of which 361 were accurate and were able to receive an invitation to participate in the online questionnaire. After reminders, 263 people (73%) answered the questionnaire, of which 248 (68%) were complete.

Data collection procedures

The data collection proceeded in two stages. First, we collected email addresses from skiers and snowboarders at the ski resort for eleven days spread out over four weeks during February and March. To achieve some variance in the perceptions of crowding, we collected data on weekdays when fewer people were expected to visit as well as on weekends and during the winter holiday. We approached visitors near the restaurants and ticket offices within the two areas that comprise the ski resort and visitors who were queuing for tickets or having a break and asked them whether they were willing to sign up for an online questionnaire. Persons who signed up for the online survey then received an email invitation with the link to the online questionnaire. We made sure to send the invitation email either on the same day or on the day after they had signed up and within 48 hours after being approached. We sent out two reminder emails in two days, encouraging the respondents to fill out the questionnaire within a week after their experience to avoid respondent recall problems (Neuman, 2011).

Measures

The outline of the questionnaire by Machleit et al. (2000) was taken as the basis, and some extensions and adaptations were made (including the exclusion of some measures for further analysis that are not relevant for this study). The questionnaire was then reviewed in terms of face validity, layout, and response format by four researchers and pre-tested using a convenience sample of 20 people that ski and/or snowboard.

Perceived crowding. Perceived crowding was measured using an adapted version of the four-item scale of human crowding (Machleit et al., 1994; 2000). Items were rated on a seven-point Likert-type scale from “strongly disagree” to “strongly agree.” In addition, participants also indicated how crowded certain areas in the resort were at the time of their visit (the lifts, the service facilities, the slopes, and the resort overall) on a nine-point Likert-type scale. This measure is very common in outdoor recreation (Shelby et al., 1983; Vaske & Shelby, 2008), but in this study, it merely provides additional information on the relative crowdedness of the areas. It was not included in any of the main analyses and marked as “alternative crowding measure.” Nevertheless, a short comparison of the common one-item measure frequently used in outdoor recreation (Item 4) and the 4-item measure by Machleit et al. (1994) is provided. Please refer to Table 1 for a complete list of items for all scales.

Emotions. Emotions were measured with the Differential Emotions Scale (DES) by Izard (1977). The 10 emotions of joy, sadness, interest, anger, guilt, shyness, disgust, contempt, surprise, and fear were measured using 27 items. To ensure understanding, we added a translation of the adjectives to Norwegian in brackets and pre-tested the items with Norwegian participants. Following Machleit et al. (2000), we asked respondents to indicate the extent to which the listed adjectives described their feelings during the experience at the ski resort on a five-point Likert-type scale from “not at all” to “very much so.”

Satisfaction. Satisfaction was measured using an 11-point scale to capture a wide range of responses, as suggested by Fornell et al. (1996) and Chan Lai et al. (2003). Four items were adapted from Homburg et al. (2005).

Loyalty was measured by four items adapted from Lee et al. (2004). The wording of the items was changed from “I would” to “I will” to make the statements more straightforward. Respondents indicated their level of agreement with the statements on a five-point Likert-type scale.

Prior expectations were assessed by a one-item measure adapted from Machleit et al. (2000). Respondents were asked to indicate their prior expectations of crowding on a seven-point Likert-type scale from 1 (“fewer people than were expected”) to 4 (“about as many people as expected”) to 7 (“more people than were expected”). This direct measure of discrepancy indicates both strength and direction in accordance with the expectancy-disconfirmation theory (Oliver, 1997).

Tolerance to crowding was assessed by a four-item measure adapted from Machleit et al. (2000). The items were rated on a seven-point Likert-type scale. The objective measure of *visitor density* was included to strengthen the validity of the design; it was assessed by the number of visitors on the day of the data collection and, see Appendix A.

Data analyses

The data were analyzed using IBM SPSS Statistics 21. An initial data screening with SPSS found that the distributions of the negative emotions, except for fear and anger were very peaked and positively skewed. There was small variance in responses to the constructs of sadness, guilt, shyness, disgust, and contempt with means ranging from

Table 1. Descriptive statistics, distribution, reliability and convergent validity.

Constructs and items	<i>n</i>	Items	<i>M</i>	<i>SD</i>	α	ω	1 st Factor	Factor loadings	Communalities
<i>Perceived Crowding (7-point)</i>	248	4	3.76	1.59	.89	.90	76%	.94-.70	
The ski resort seemed very crowded to me.			3.56	1.83				.94	.88
The ski resort was a little too busy.			3.33	1.75				.93	.86
There wasn't much traffic at the ski resort during my trip (R).			3.82	1.89				.70	.49
There were a lot of people at the ski resort.			3.96	1.89				.89	.80
<i>Alternative Crowding measure (9-point)</i>	248				.90	.90	78%	.95-.80	
The lifts			4.63	2.29				.89	
The service facilities			4.87	2.02					
The slopes			4.14	1.74					
Sirdal Skisenter (overall)			4.46	1.83					
<i>Satisfaction (11-point)</i>	243	4	7.92	1.96	.86	.86	73%	.88-.79	
All in all, I am satisfied with this trip to Sirdal Skisenter.			8.89	1.74				.88	.78
This trip to Sirdal Skisenter meets my expectations.			8.57	2.02				.86	.73
This trip to Sirdal Skisenter compares to an ideal ski resort experience.			6.01	2.80				.79	.63
Overall, how satisfied are you with the visit to Sirdal Skisenter?			8.21	1.86				.88	.78
<i>Loyalty (5-point)</i>	246	4	4.18	.71	.87	.92	73%	.95-.49	
I will recommend Sirdal Skisenter to people who seek my advice.			4.03	.89				.94	.88
I will tell other people positive things about Sirdal Skisenter.			4.04	.88				.95	.90
I will recommend Sirdal Skisenter to my friends.			4.02	.89				.95	.90
I will visit Sirdal Skisenter again.			4.61	.63				.49	.24
Constructs and items		Items	<i>M</i>	<i>SD</i>	α	ω	1 st Factor	Factor loadings	Communalities
<i>Visitor Density</i>	230	1	1552	699					
<i>Tolerance to Crowding (7-point)</i>	248	4	3.52	1.13	.61	.63	47%	.79-.45	
I avoid crowded slopes whenever possible (reversed).			4.94	1.62				.77	.59
A crowded slope doesn't really bother me.			3.07	1.71				.79	.63
If I see a slope that is crowded, I won't even go (reversed).			3.26	1.75				.67	.45
It's worth having to deal with a crowded slope if I can save time and money.			3.22	1.58				.45	.20
	248	1	3.62	1.60					

(continued)



Table 1. Continued.

Constructs and items	<i>n</i>	Items	<i>M</i>	<i>SD</i>	α	ω	1 st Factor	Factor loadings	Communalities
<i>Prior Expectations</i> (Please indicate your prior expectations of crowding; 7-point)									
<i>Cognitive Specialization/ Skills and knowledge</i> (9-point)	248	3	6.23	1.70	.96	.96	93%	.98-.95	.94 .95 .90
My confidence level as a skier/snowboarder.			6.23	1.73				.97	
My knowledge/ability of skiing/snowboarding.			6.25	1.73				.98	
My ability to adapt to different skiing/snowboarding situations.			6.11	1.82				.95	
<i>Emotions</i> (5-point)									
Joy	246	3	4.12	.66	.83	.83	75%	.89-.84	.80
Happy			4.25	.67				.89	
Delighted			4.12	.79				.87	.75
Cheerful			3.99	.82				.84	.71
Sadness	248	3	1.27	.62	.91	.91	84%	.93-.90	.87
Sad			1.28	.65				.93	
Gloomy			1.29	.71				.90	.80
Depressed			1.23	.67				.93	.86
Interested	242	2	3.95	.69					
Alert			3.93	.78					
Attentive			3.98	.74					
Anger	244	3	1.45	.69	.83	.83	77%	.92-.80	.85
Mad			1.39	.83				.92	
Angry			1.32	.66				.91	.82
Irritated			1.65	.95				.80	.65
Guilt	248	3	1.27	.63	.86	.87	79%	.91-.85	.72
Guilty			1.24	.72				.85	
Repentant			1.29	.71				.91	.83
Blameworthy			1.27	.71				.91	.82
Shyness	248	3	1.24	.55	.83	.84	75%	.91-.82	.67
Ashamed			1.20	.63				.82	
Bashful			1.23	.63				.91	.83
Shy			1.27	.67				.87	.75
Contempt	248	4	1.17	.52	.95	.95	88%	.96-.91	.83
Disregard			1.18	.58				.91	
Contemptuous			1.19	.59				.96	.93
Scornful			1.17	.54				.93	.87
Defiant			1.16	.52				.94	
Surprise	245	2	1.77	.90	.52				.88

Astonished				1.50	.95
Surprised				2.04	1.17
<i>Fear</i>	234	2		1.43	.67
Fearful				1.36	.66
Nervous				1.50	.80
<i>Disgust</i>	248	2		1.17	.55
Disgust				1.15	.54
Distaste				1.19	.61

1.17 to 1.27 (standard deviations ranging from .52 to .63) on a 5-point scale, see [Table 1](#). Therefore, we excluded them from subsequent analyses.

For the constructs satisfaction, loyalty, joy, anger, interest, surprise, and fear, a few outlier values were deleted, which resulted in acceptable skewness and kurtosis values and reasonably normal distributions. The Shapiro-Wilks test and the Kolmogorov-Smirnov test were significant for all constructs. [Table 1](#) depicts the descriptive statistics for the construct as well as items.

Reliability and validity analysis

All constructs with three or more items were subject to reliability analysis (see [Table 1](#)). Cronbach's alphas and McDonald's omega indicated acceptable reliabilities, with alpha scores ranging from .83 to .96, except for tolerance to crowding construct with a coefficient alpha of .61. (Nunnally, 1978). For constructs measured with less than three items, inter-item correlations ranged from .52 to .83 (Cohen, 1992), which was considered acceptable in terms of internal consistency.

The convergent validity was assessed using principal component analysis (PCA) with varimax rotation of all constructs measured with more than two items. Since our study is the first to adapt measures of perceived crowding to a recreational hedonic context of winter sports activities, PCA was chosen following Pett et al. (2003) suggestion for exploratory factor analysis. Unit-weight composites were used to compute factor scores. We report the percentages for the explained variance, factor loadings, and communalities in [Table 1](#).

The discriminant validity was assessed by reviewing the correlations between constructs. All correlations were significantly less than 1 (Burnkrant & Page, 1982), meaning that the constructs diverged (Neuman, 2011), as seen in the correlation matrix in [Table 2](#).

As expected, higher visitor density is associated with higher perceptions of crowding ($r = .64, p < .01$).

Mediation and moderation analysis

Because of the explorative nature of the study and the complicated, simultaneous moderating effects of continuous variables suggested in the model, we chose to do the analyses with Ordinary Least Squares regression and PROCESS for SPSS (Hayes, 2013). According to Hayes et al. (2017), it might not be necessary or better to use SEM for mediation analysis. For the purpose of this study PROCESS served as a powerful instrument, and the arguments for simplicity of use and interpretation of PROCESS outweighed potential benefits that would have come along with a range of complex issues associated with SEM (Nachtigall et al., 2003). For models of observed variables, differences in results when applying SEM or PROCESS tend to be trivial, and rarely will the substantive conclusions a researcher arrives at be influenced by the choice of PROCESS rather than SEM (Hayes et al., 2017). Finally, using PROCESS allowed us to enter two moderators into the regression pathway simultaneously, to test the moderation effects of prior expectations and tolerance to crowding on the crowding-satisfaction relationship.

The assumptions of sample size, normality, linearity, homoscedasticity, and independence of residuals were all assessed prior to the OLS regression analyses. The sample size for each of the analyses was considered appropriate. The distribution of all constructs except anger was acceptable. Potential problems associated with collinearity and singularity have not been found except for the relationship between prior expectations of crowding and crowding. The assumptions of linear relationships and homoscedasticity has been checked for all relevant combinations of constructs. For the mediation and moderation analysis, we used a 95% bias-corrected bootstrap confidence interval based on 10,000 bootstrap samples as well as the heteroscedasticity-consistent standard error estimator HC3. In line with Hayes (2013), we report unstandardized coefficients. We calculated the main effects of crowding on loyalty and density on crowding using linear regression analyses in SPSS.

Results

Sampling results and demographics

Among surveyed visitors to the ski resort, 36% of the participants were women. The mean age of the participants was 35 years ($SD = 10.70$), and about five percent of the respondents completed secondary school, while 28% graduated from high school, and 67% held a university degree. Over 80% of the respondents were skiers, and respondents considered themselves moderately to highly skilled and knowledgeable, with an average of 6.23 ($SD = 1.70$) on a scale from 1 to 9.¹ Around 72% of the respondents stayed at the resort for one day, 1.7 ($SD = 1.48$). Most of the participants (91%) had visited the resort before. On average, the respondents had been coming to the ski resort for 12.4 years (ranging from 0 to 55 years: 0–5 = 39%, 6–10 = 21%, 11–15 = 13%, 16–20 = 9%, ≥ 21 years = 19%) and spent 9.2 days ($SD = 8.42$) per season, ranging from 1 to 60 days.

Regarding the activity performed on the day that they were questioned, 81% of the respondents were skiing whereas 17% were snowboarding. The calculated average of the cognitive dimension of recreation specialization (measure adapted from Won et al. (2008)) was 6.23 ($SD = 1.70$) on a scale from 1 to 9, indicating a moderate to high level of self-reported skill and knowledge in the sample. As a side note, with this sample the construct specialization measure did not correlate significantly with crowding as suggested by other empirical research in outdoor recreation. With scores around the mid-point, both on the alternative crowding scale and the crowding scale used for the analyses in this study, people felt slightly to moderately crowded at Sirdal Skisenter, with the highest scores given to the service facilities, followed by the lifts and the slopes (see Table 1). As expected, the visitors were very loyal to the resort, both regarding their intentions to recommend the resort as well as their intentions to return. Most respondents enjoyed the trip very much and experienced a high level of interest. To a lesser extent, participants felt surprised. The average experience of negative emotions was low, with anger scoring the highest, followed closely by fear.

Investigating correlations between crowding, emotions, satisfaction, and loyalty

To test H1 (Perceived crowding will correlate positively with negative and neutral emotions and negatively with positive emotions), and to test which constructs fit the model before employing linear regression analyses, we assessed correlations between the constructs in Table 2, showing that crowding correlated with the positive emotion dimensions. As expected, we found a significant negative relationship between crowding and joy. The correlation between crowding and interest was not significant, and interest was therefore excluded from further analyses.

We found significant positive correlations between crowding and all negative emotion types, whereas anger had the strongest correlation with crowding, as expected. However, only fear and anger were included in further analyses to avoid the violation of the assumption of normality and a lack of variance. All negative emotions correlated significantly with satisfaction except for fear and shyness that were excluded from further analyses. Crowding and surprise were weakly but positively and significantly correlated. Finally, loyalty correlated relatively strongly (stronger than crowding) with emotion types. The strongest correlations emerged between loyalty and joy and between loyalty and anger. It appears that the two crowding measures behave in the same way, but that the correlations with the multi-item construct used in this study are slightly stronger in most cases.

Assessing mediation in the relationship between crowding, emotions, satisfaction, and loyalty

In the mediation analysis, we tested joy and anger. We included joy and anger as mediators in parallel multiple mediation analysis (see results in Table 3).

Based on correlation analyses (see Table 2), the relationship between crowding and satisfaction was of medium size. The crowding-satisfaction relationship was (partially) mediated by anger and joy, and direct effects of crowding on satisfaction remained significant, thus supporting hypothesis H2b (see Table 3).

Crowding influenced satisfaction directly and indirectly through joy and anger. Visitors who felt more crowded experienced less joy ($a_1 = -.06$) and more anger ($a_2 = .14$) which resulted in lower levels of satisfaction ($b_1 = 1.21$; $b_2 = -.34$). The 95% bias-corrected bootstrap confidence intervals for the specific indirect effects through joy ($a_1b_1 = -.07$) and anger ($a_2b_2 = -.05$) based on 10,000 bootstrap samples were below zero ($-.15$ to $-.01$ for joy; $-.10$ to $-.003$ for anger), as was the bootstrap for the total indirect effect ($a_1b_1 + a_2b_2 = -.12$) that ranged from $-.22$ to $-.04$. A comparison between the specific indirect effects showed that the effects were not significantly different, as the 95% bias-corrected bootstrap confidence interval straddled zero ($-.04$ to $.12$) while the point estimate for the difference was $.03$. There was also evidence for a direct effect ($c' = -.21$, $p < .01$) with a 95% bootstrap confidence interval ranging from $-.35$ to $-.07$. The total effect of crowding on satisfaction ($c = -.33$) was significant at the $.001$ level. Crowding influenced loyalty indirectly through satisfaction. Hypothesis H2c was supported, as higher levels of crowding correlated negatively with satisfaction and loyalty, while satisfaction acted as a mediator of the relationship between crowding and loyalty behavioral intentions (see Table 4).

Table 2. Correlations.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Prior expectations	1																
2. Tolerance	-.07	1															
3. Alternative crowding	.55**	-.01	1														
4. Crowding	.62**	.01	.79**	1													
5. Satisfaction	-.28**	.17**	-.21**	-.30**	1												
6. Loyalty	-.19**	.06	-.20**	-.23**	.66**	1											
7. Joy	-.20**	.12	-.10	-.15*	.52**	.48**	1										
8. Anger	.34**	.04	.29**	.37**	-.36**	-.41**	-.36**	1									
9. Surprise	.17**	.06	.17**	.16*	-.02	-.00	-.01	.19**	1								
10. Interest	-.09	.01	-.03	-.10	.29**	.24**	.45**	-.25**	-.08	1							
11. Fear	.13*	-.00	.14*	.14*	-.04	-.03	-.10	.25**	.37**	-.10	1						
12. Sadness	.21**	.03	.15*	.16*	-.25**	-.38**	-.37**	.64**	.28**	-.25**	.29**	1					
12. Guilt	.24**	-.01	.18**	.22**	-.24**	-.35**	-.36**	.52**	.31**	-.17**	.32**	.66**	1				
13. Shyness	.25**	.05	.17**	.20**	-.11	-.27**	-.23**	.43**	.38**	-.19**	.52**	.65**	.77**	1			
14. Contempt	.18**	.07	.14*	.19**	-.14*	-.29**	-.25**	.47**	.40**	-.23**	.46**	.68**	.75**	.82**	1		
15. Disgust	.17**	.01	.16*	.15*	-.18**	-.32**	-.29**	.46**	.29**	-.17**	.38**	.58**	.72**	.71**	.71**	1	
16. Visitor density	.41**	.01	.58**	.64**	-.23**	-.07	-.12	.27**	.02	-.06	.03	.02	.05	-.03	-.01	-.02	1

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 3. Joy and anger as mediators in parallel multiple mediation analysis.

Antecedent		Consequent										
		Joy			Anger			Satisfaction				
		Coeff.	SE	<i>p</i>	Coeff.	SE	<i>p</i>	Coeff.	SE	<i>p</i>		
Crowding	a_1	-.06	.03	< .05	a_2	.14	.03	< .001	c'	-.21	.07	< .01
Joy		—	—	—		—	—	—	b_1	1.21	.18	< .001
Anger		—	—	—		—	—	—	b_2	-.34	.17	< .05
Constant	i_{M1}	4.37	.11	< .001	i_{M2}	.91	.09	< .001	i_Y	4.20	.90	< .001
		$R^2 = .02F(1,236) = 4.94, p < .05$			$R^2 = .11F(1,236) = 27.17, p < .001$			$R^2 = .32F(3,234) = 34.40, p < .001$				

^a $n = 238$.**Table 4.** Satisfaction as mediator between crowding and loyalty.

Antecedent		Consequent						
		Satisfaction			Loyalty			
		Coeff.	SE	<i>p</i>	Coeff.	SE	<i>p</i>	
Crowding	a	-.35	.07	< .001	c'	-.01	.02	.73
Satisfaction		—	—	—	b	.25	.02	< .001
Constant	i_1	9.21	.28	< .001	i_2	2.22	.22	< .001
		$R^2 = .10F(1,240) = 24.09, p < .001$			$R^2 = .43F(2,239) = 73.33, p < .001$			

^a $n = 242$.

Visitors who felt less crowded were more satisfied with their experience ($a = -.35$). More satisfied visitors also indicated higher intentions to recommend and revisit the site ($b = .25$). A 95% bias-corrected bootstrap confidence interval for the indirect effect ($ab = -.09$) based on 10,000 bootstrap samples did not cross zero ($-.13$ to $-.05$), which means that the effect was statistically different from zero and that mediation occurred (Hayes, 2013). The normal theory-based Sobel test yielded the same result ($Z = -4.52, p < .001$), although the bootstrap is the recommended and more accurate test because it is robust to violations of normality. The size of the indirect effect was about 22% ($\kappa^2 = .22$) of its maximum possible value (Hayes, 2013). The direct effect was non-significant ($c' = -.01, p = .73$), with a 95% bootstrap confidence interval ranging from $-.06$ to $.04$. The total effect of crowding on loyalty ($c = .03$) was significant at the .01 level.

Testing expectations of crowding and tolerance to crowding as moderators of the crowding-satisfaction relationship

The results above suggest that the crowding-loyalty relationship is indirect and potentially depends on the moderators of the crowding-satisfaction relationship. When considering tolerance to crowding as the moderator, people did vary in their tolerance to crowding, with a mean of 3.52 ($SD = 1.13$) on a scale from 1 to 7. Tolerance to crowding was weakly but significantly correlated with satisfaction, explaining about 3% of the variance in satisfaction, but not with crowding. The variance in prior expectations was also substantial, a mean of 3.62 ($SD = 1.60$) on a scale from 1 to 7. Around 40% of the respondents had accurate expectations and experienced about as many people as expected, for the median and mode score of 4.

Following Hayes's (2013) advice, we conducted one analysis with both moderator variables entered simultaneously and two simple moderation analyses for each moderator separately. Subsequently, we compared the results. To make the coefficients more meaningful to interpret, we mean-centered crowding, prior expectations, and tolerance variables, as suggested by Hayes (2013).

When entering both moderator variables into the analysis, prior expectations of crowding and tolerance to crowding did not influence the effect of crowding on satisfaction (for product of crowding and prior expectations, $b = -.05$, $t(237) = -1.29$, $p = .20$; for product of crowding and tolerance, $b = .01$, $t(237) = .10$, $p = .92$), rejecting H3a and H3b. The results of the separate moderation analyses were consistent with the findings above. We present a summary of the results of the simple moderation analyses in Tables B1 and B2 in Appendix B. Surprisingly, the crowding-satisfaction relationship did not seem to be dependent on the two moderators, as demonstrated by the insignificance of the interaction effects.

Discussion

The aim of this study was to examine how perceptions of crowding and emotions influence visitor satisfaction and loyalty in a managed visitor attraction. In this section, we will discuss the specific emotions that were evoked by perceived crowding in a ski resort setting, and how these influence satisfaction. Then we will discuss how the effect of crowding on satisfaction depends on visitors' prior expectations and tolerance to crowding. Finally, we will highlight the limitations of this study and offer methodological, theoretical, and practical implications for visitation management.

Our results indicated that both joy and anger partially mediated the crowding-satisfaction relationship in this hedonic setting, even though a direct effect of crowding on satisfaction remained. Our study also suggests that satisfaction mediates the crowding-loyalty relationship.

Contrary to previous studies, e.g., Machleit et al. (2000) and Hwang et al. (2012), we observed a negative and significant association between joy and crowding. Leisure research has shown that enjoyment with experience can decrease by encounters with other people, or it can be increased by visitor density, all dependent on the visitors' motivation. When the motivation is "to get away from other people," visitors will feel crowded and experience less joy during their trip. In our study, visitors who felt crowded felt less joy, and we assume that their motivation to practice the craft of snowboarding or skiing may explain this result. Perceived high density on the slopes meant that visitors could not ski the way they wanted, which resulted in less joy and less satisfaction with the experience. At the same time, the relationship between interest and crowding was not significant. This might have been due to the context – a recreational hedonic experience – when the feeling of joy is supposedly more essential than during a shopping experience, for instance. Previous findings of Eroglu et al. (2005) and Noone and Mattila (2009), who reported that the difference between hedonic/utilitarian values or goals matters in determining the strength of the crowding-satisfaction relationship, support this explanation. The strong correlations between joy and satisfaction are also

consistent with Faullant et al. (2011), who proposed that joy is one of the primary emotions felt during mountaineering experiences and is closely related to satisfaction.

The results of our study suggest that (at least in this ski resort context), prior expectations of crowding and tolerance to crowding play only a marginal role in people's evaluations of crowdedness based on certain visitor density levels. These results are different from Machleit et al. (2000) findings in the retail context and more recent findings in the tourism/recreation context using simpler methods of analysis (Bell et al., 2011; Needham et al., 2004, 2018). Nevertheless, these results do not challenge the general ideas of normative and expectancy-disconfirmation theory, as people did vary in their tolerance to crowding, as prior expectations explained a large part of the variance in crowding and a smaller part of the variance in satisfaction. See Appendix C for supplementary analyses where marginal moderating effects of prior expectations and tolerance to crowding were found in the relationship between density and perceptions of crowding, further supporting normative and expectancy theory.

Our results showed that crowding correlated significantly with all negative emotion type constructs, in line with previous studies (e.g., Mattila & Hanks, 2012). Disgust and contempt did not covary strongly with perceptions of crowding. They may be too intense for a supposedly pleasant and enjoyable experience, such as skiing. Cognitive coping mechanisms may prevent intense and negative feelings from spoiling the overall goal of an enjoyable recreational experience, considering some investment is involved in the skiing activity (Manning, 2011). Shyness, guilt, sadness, and fear correlated more strongly than expected. These emotions are more "individual-oriented" (Machleit et al., 2000). In a ski resort setting, coping behaviorally with crowding depends on the individual performance and skills as a skier or snowboarder (Buckley, 2006). Depending on the individual experience and confidence-level regarding the activity, taking the lift or skiing in a crowded environment may increase attention to the self, function as barriers to positive emotion-evoking exploration, reduce interest and enjoyment, and result in feelings of shyness or shame (Izard, 1977; Machleit et al., 2000).

Guilt is very closely associated with feelings of shyness and shame, and it may occur when people get sanctioned for some sort of misconduct or violations of social conventions (Izard, 1977; Machleit et al., 2000). These feelings may also be attributed to situations in crowded spaces where people are blocking the way for others, do not act quickly enough, cut the line, or act impolitely (Machleit et al., 2000). A high correlation of crowding with sadness may appear for the same reason. Increased attention to the self and the individual performance results in a higher risk of failure (Izard, 1977; Machleit et al., 2000). Furthermore, crowding may prevent the achievement of goals, which can also typically increase feelings of sadness. Skiing or snowboarding can be a threatening experience, and crowding apparently enforces these feelings of fear (Izard, 1977; Machleit et al., 2000). Fear is also a primary emotion in mountaineering experiences (Faullant et al., 2011), an element of risk that defines adventure tourism (Buckley, 2006). The individual-oriented negative emotions may be felt more strongly in other sporting recreation contexts (hiking in crowded environments), or in any fitness setting where reaching goals may partly depend on others' actions, performance, and pace.

All negative emotions, except for fear and shyness, were significantly correlated with satisfaction. Fear and shyness, individual-oriented emotions, did not seemingly influence the experience elements. This is somewhat contrary to Faullant et al. (2011), who found that fear in mountaineering is related to experience evaluations and suggested that increasing security information could decrease satisfaction ratings.

Limitations and implications

One of the most important limitations concerns the design of the study. A cross-sectional survey does not allow to make causal statements due to the lack of temporal order and non-spuriousness (Hayes, 2013). Other cross-sectional studies (e.g., Ramkissoon & Movondo, 2015) have found evidence of a reversed causal order suggesting that the experienced satisfaction at a place may be the driving behavior at the place and place attachment, implying that in our case, satisfaction should be driving perceptions of crowding. Hopefully, future studies will be able to investigate causal order by time series and experiments.

Further limitations stem from the data (a) being merely correlational; (b) based on retrospective self-reports, implying that it was not possible to appropriately control for external influences, such as weather, snow conditions, and specific locations in the resort; (c) depended on the recall of the visitors. Common method bias may have influenced collinearity between prior expectations of crowding and crowding, and the differences in ratings of the crowding construct. Non-probability sampling may have affected the generalizability of the study. The use of principal component analysis as opposed to an exploratory factor analysis with a maximum likelihood approach, or a confirmatory factor analysis could be a limitation as well. This study relies on Cronbach's Alpha (α) as a traditional measure of reliability that has been criticized. We have therefore included other measures of reliability, such as factor loading and ω coefficient.

Our study may offer some methodological implications. First, the emotion types, as defined by Izard (1977) seemed to be fitting the context only to a limited extent. Future studies should consider using alternative scales or a shortened version of the current scale. The moderation analysis with the continuous variable prior expectations of crowding yielded different findings when using PROCESS for SPSS as opposed to a simple ANOVA with a categorized version of the same construct. This may motivate researchers to challenge existing findings with method triangulation. Future studies should consider using an EFA with ML approach to address the measurement error issue and create factor solutions based on true score variance with error covariances. Further, future research can build on the current study to perform a confirmatory factor analysis followed by the OLS and PROCESS.

The results of our study have implications for future research on the perceptions of crowding and visitor behavior. Other factors that moderate the crowding-satisfaction relationship either in different types of managed visitor attraction (e.g., heritage attractions) or in a leisure context, in general, need to be considered. Possible moderators could be cognitive and behavioral coping mechanisms employed by visitors, such as the extent to which people feel that they are in control, resort-type, information that is being provided (Tseng et al., 2009), or the extent to which people think that the

management makes an effort to accommodate increased visitor density (Machleit et al., 2000).

There is also a need to study behavioral changes that visitors can make to avoid crowding (Needham et al., 2018) and undesirable changes in the site's conditions. The concepts of destination loyalty and displacement seem to be closely related in this context. Future studies should also investigate how visitors' behaviors change in crowded conditions, for example, through time block diary analysis (Vassiliadis et al., 2013), with the help of GPS (Dickson et al., 2011), or via ski lift technology.

Concluding remarks

This is the first study investigating mediating and moderating mechanisms of the relationships between perceptions of crowding, visitor satisfaction, and loyalty with continuous measures and process analysis in managed visitor attractions. The findings indicate that the emotions of joy and anger mediate the relationship between perceived crowding and satisfaction. Satisfaction mediates the effect of crowding on loyalty. Contrary to findings in other leisure contexts, the effect of crowding on satisfaction do not seem to depend on prior expectations of crowding nor on tolerance to crowding.

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