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Crowding Perception in a Tourist City:
A Question of Preference

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Two main topics are analysed in this paper: a crowding model for an urban destination is tested by the use of a binary logistic model in order to identify the variables influencing crowding perception; and the inherent negativity of the crowding concept, as is often assumed, is examined through association statistics. The results confirmed that personal and behavioural variables have a larger effect on the perception of crowding than use-level. Furthermore, the relationship between crowding and experience, while significantly negative, could only be found in respondents with a preference for low, and a perception of high, use-levels, while for the majority of individuals the perception of a certain crowding level did not lead to a negative evaluation of the conditions. This proves that the concept of crowding cannot be assumed to be implicitly negative, and needs individual preferences to be fully understood.

Tourism has become an economic sector of worldwide importance. On the demand side, a variety of driving forces have been responsible for the emergence of the rise in tourism, such as the increase in income, the rise in leisure time, changes in lifestyles regarding geographical mobility, and interest in new cultures and localities. On the supply side, various factors can be distinguished, such as the decline in transportation costs, the global access to tourist places as a result of ICT progress, and the emergence of a professional tourist industry geared towards tailor-made travel solutions. Since the 1960s, tourism has expanded into all corners of the earth, transforming the world into a global village (Daskalopoulou & Petrou, 2009; Theobald, 2004; Theuns, 2002).

Partly as a result of the rapidly rising global economic impact of tourism, and in the context of the international debate on sustainable development, there is a growing need for a thorough reflection on a sustainable form of tourism, where the socio-economic interests of the tourist sector are harmonized with the environmental and social constraints of the destination. Among these potential social constraints are crowding externalities. In popular tourist destinations, city centres – such as Venice, Amsterdam or Bruges – and tourist facilities – such as popular exhibitions or beaches – may attract large numbers of visitors, giving rise to crowding phenomena (e.g. Canestrelli & Costa, 1991; Riganti & Nijkamp, 2008).

This article addresses the issue of crowding in popular urban tourist sites. Tourism crowding occurs if too many visitors want to visit the same destination at the same time, giving rise to two types of overcrowding: between visitors mutually, and between visitors and locals. While the latter type has already received widespread attention, leading to the development of phase models (e.g. Butler, 1980), attitudinal models (e.g. Doxey,

1975; Page, 1995), behavioural models (e.g. Ap & Crompton, 1993; Carmichael, 2000), or a combination of these (e.g. Bryon, 2005), the former has often been neglected. Notable exceptions can be found in Cole and Steward (2002), Patterson and Hammitt (1990), Shelby, Vaske, and Heberlein (1989), Steward and Cole (2001), and Tarrant and English (1996). All the aforementioned works, however, concern themselves with the effects of crowding in wildlife settings. Scientific research regarding the perception and consequences of tourist crowding in an urban environment has been rather limited, mainly focusing on city parks (Arnberger & Haider, 2007; Hammitt, 2002; Westover & Collins, 1987), or special events (Lee & Graefe, 2003), signalling the need for further studies in this area.

The aim of the present paper is to analyse crowding perception among tourists in a tourist city, with a particular interest in the driving forces of perceived crowding by tourist visitors. After a literature review on crowding in general, and on crowding in tourist sites in particular, the methodology will be described. Next, the results of a binary logistic regression model for crowding in an urban tourist city are presented, while the paper will conclude with some retrospective and prospective remarks.

Literature Review

Defining the Concept of Crowding

A first, necessary, consideration in every crowding study is the delineation of the crowding concept, which has its theoretical foundation in environmental and behavioural psychology. Influenced by the animal studies of Calhoun (1962, 1966), Stokols (1972) describes crowding as a stress situation that develops over time as a result of spatial limitations which place constraints upon social activities. Taking into account the findings of correlational (Mitchell, 1971; Schmitt, 1957, 1966; Winsborough, 1965), ecological (Barker, 1965, 1968; Hall, 1959, 1966), and experimental (Freedman, Klevansky, & Ehrlich, 1971; Hutt & Vaizey, 1966; Proshansky, Ittelson, & Rivlin, 1970) human crowding studies, which demonstrate how the effect of crowding upon humans is largely mediated by cultural and activity-related variables, Stokols concludes that spatial restrictions only serve as a necessary antecedent, and not a sufficient condition, for the arousal of crowding stress in human beings. In this view, crowding becomes a socio-psychological evaluative concept leading to a negative affective response to social density, unlike the more general term 'congestion' which is essentially an objective state of a discrepancy between supply and demand. Choi, Mirjafari and Weaver (1976) disagree with Stokols' assumption that crowding is an unpleasant state of experience, proposing an alternative conceptualization which distinguishes between a cognitive state of crowding and a cognitive-affective, or physiological, state of crowding, thereby effectively distinguishing between crowding as an object and an affect. While Stokols' conceptualization has received a large share of attention, among others in leisure studies, the approach of Choi et al. has been somewhat overlooked in contemporary touristic research. This has had major consequences on the theory-building of the concept, where its intrinsically negative connotation has led crowding to be linked with the broader concepts of carrying capacity and sustainability (Patterson & Hammitt, 1990; Shelby et al., 1989; Vaske & Donnelly, 2002).

Adopting the definition of the World Tourism Organization, which defines carrying capacity as "the maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic and socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction" (in Priority Actions Programme/Regional Activity Centre, 1997, p.5), clearly shows the relation between carrying capacity as a threshold and sustainability as a result of compliance with this limit. The definition also indicates how a specific carrying capacity exists for each of the identified dimensions. Crowding is thus seen as the violation of the socio-cultural carrying capacity, which is generally defined through the use of norms (Donnelly, Vaske, Whittaker, & Shelby, 2000; Heywood & Murdock, 2002; Manning,

Valliere, Wang, & Jacobi, 1999; Patterson & Hammitt, 1990; Vaske, Graefe, Shelby, & Heberlein, 1986), leading to a decline in the positivity of a tourist experience.

Based on the works of Parsons (1937), Heywood (1996) defines norms as shared beliefs about how behaviour and conditions ought to be under specific circumstances. A distinction can be made between social and personal norms, where social norms are standards, shared by different members of a social group, while personal norms do not become internalized by all group members. Instead, these norms refer to an individual's own expectations (Donnelly et al., 2000). The identifiable structural characteristics of norms are: the range of acceptable conditions; the norm intensity; and the crystallization around the norm, which shows the variation of personal norms around the social norm (Manning et al., 1999). It is clear that the carrying capacity of a destination is a function of a social norm, aggregated from the personal norms concerning crowding.

However, the use of social norms to identify a carrying capacity gives rise to some important critiques. According to Manning et al. (2002), normative theory is not applicable to outdoor recreation research, since the theory is based upon rules which influence individual behaviour through social pressure and the possibility of sanctioning deviating individuals. This norm enforcement is often not possible in the recreational sphere, which leads to the possibility that the diversity of personal norms does not converge to a stable social norm. Moreover, personal norms are dependent on the activities undertaken, the type of the destination, the places visited within this destination, and personal preferences (Donnelly et al., 2000; Lee & Graefe, 2003). If, as a result, these norms do not easily converge to one meaningful social norm, it is clear that use of the social norm as the carrying capacity of a destination loses its purpose. Moreover, using a social norm, resulting in one optimal development level would not only be nonsense, it would lead to the erroneous assumption that not exceeding this level would lead to a sustainable development of the destination. Furthermore, the use of norm theory to identify carrying capacity only makes sense if crowding is indeed, as Vaske and Donnelly (2002) argue, a negative evaluation as a result of personal norm violation. However, previous research in recreational settings has generally found only a marginal relationship between crowding and the tourist experience.

Since use of a normative framework fails to explain situations in which crowding is not considered negative, it is necessary to test the hypothesis whether crowding actually is inherently negative, diminishing the tourist experience.

Different Dimensions of Crowding Determinants

There is a broad academic consensus about the different dimensions that influence crowding perception. Even though Choi et al. (1976) rightly state that there is a certain degree of confusion between the terms 'crowding' and 'density', with many writers using the concepts interchangeably, theoretically it has long been clear that crowding cannot be defined by density measures alone (Shelby et al., 1989). Broadly speaking, three substantial factors are identified: situational characteristics of the environment, characteristics of others present, and personal characteristics of the individual (Kyle, Graefe, Manning, & Bacon, 2004; Stokols, 1972; Stokols, Rall, Pinner, & Schopler, 1973; Westover, 1989)

The first set of characteristics, the situational environmental characteristics, combine physical features and variables that influence accessibility. A first, necessary environmental attribute that influences the experience of crowding at a destination is the number of visitors, since, as emphasized by Lee and Graefe (2003) and Vaske and Donnelly (2002), use-level is quintessential in understanding the feeling of crowdedness. Indeed, both Stokols (1972) and Choi et al. (1976) ultimately consider crowding as an evaluation of a certain density level. Apart from the quantity of other visitors, crowding perception can also vary with the availability of resources, and the accessibility to these resources (Arnberger & Haider, 2007; Shelby et al., 1989). While the availability of resources within an urban tourist destination can be operationalized by the number of attractions visited, the accessibility of urban space can be estimated by the places within

the destination being accessed by the tourists. Both variables therefore solely relate to the personal urban experience of the tourist, which only amounts to the experience of these specific attractions and cityscapes. Finally, Donnelly et al. (2000) also mention the importance of the type of destination: 'frontcountry' or 'backcountry'. A given number of encounters will generate greater feelings of crowdedness in remote destinations as compared with more popular tourist locations.

As a second group of factors, the characteristics of others present deal with the social situation of the destination. Yagi and Pearce (2007) highlight the importance of the origin of other tourists, compared with one's own nationality, in the evaluation of encounters, and conclude that Asian tourists seem to prefer visiting a place occupied by Western tourists, while Western visitors do not show a clear preference. Therefore, the openness and acceptability shown towards other cultures is the significant indicator. Apart from the origin, the behaviour of other tourists can be formative in crowding perception (Donnelly et al., 2000; Westover, 1989). If this behaviour does not coincide with one's own norms and values, this might lead to conflicts and irritation (Jacob & Schreyer, 1980). Furthermore, the frequency and place of contact between people is possibly of importance (Lee & Graefe, 2003; Patterson & Hammitt, 1990; Vaske, Donnelly, & Petruzzi, 1996). Vaske and Donnelly (2002) state that the number of contacts is a more important variable than use-level in itself. However, in an urban destination with high visitor numbers, the frequency of encounters is not applicable, since Lee and Graefe (2003), and Donnelly et al. (2000) rightly point out that answering questions about the encounter acceptability in an urban destination is often too burdensome for the respondent. However, corresponding with Kyle et al.'s (2004) observation that a greater importance of the social dimension decreases the perception of crowding, frequency of encounters can be replaced by the intensity of these contacts, which seems more appropriate in an urban setting. Apart from intensity, the place of contact is also of importance. When contacts are limited to public space they can be seen as less intrusive compared with contact in more personal spaces (Stokols, 1976).

Finally, the personal characteristics relate both to socio-demographic variables and to the motivations and expectations of the individual. As noted by Bauer (2003) and Gillis, Richard, and Hagan (1986), the nationality of tourists can be an important explanatory variable in the perception of, and tolerance towards others. Furthermore, the theory also postulates a direct relationship between nationality and crowding, assuming that the social background of tourists plays an important role. Apart from nationality, gender can also have an impact on the reaction towards high use-levels (Baum & Paulus, 1987), while the length of stay can be seen as a translation of Choi et al.'s (1976) concept of crowding exposure. In addition to nationality, gender, and length of stay, numerous studies consider motivations and expectations to be significant explanatory variables in the perception of crowding (Cole & Steward, 2002; Lee & Graefe, 2003), with expectations being closely related to past experiences, where frequent visitors can base their expectations on more accurate information, resulting in a heightened feeling of control and predictability (Hui & Bateson, 1991; Kearsley & Coughlan, 1999).

In the next section, the above mentioned factors will be operationalized and tested in a crowding model to empirically assess their significance on crowding perception in an urban environment. Second, the validity of the hypothesis which states that perceived crowding does not necessarily lead to a negative evaluation and a resulting diminishing tourist experience is tested, and the implications for future research are discussed.

Method

Study Area

Bruges is by far the most important tourist-historic city of Flanders with 1,408,195 overnight stays in 2009 and an average stay of 1.8 days (Toerisme Vlaanderen, 2010). The number of foreign stays was estimated at 80 per cent, with visitors arriving primarily from the United Kingdom, France, the Netherlands, and Germany. Although numbers of

day visitors are less reliable, a study of the regional tourist office of Western-Flanders estimated the number to be 3.4 million in the year 2002, when Bruges was the Cultural Capital of Europe. Approximately half of this number is attributable to national tourism (WES, 2003).

Because of Bruges' rich cultural heritage, dating back to the Middle Ages, the entire inner city has been included on the UNESCO list as world heritage. This spatial concentration of historical buildings can be explained by the medieval urban development, where the oldest houses of the wealthiest class are situated inside the former inner wall. As tourism mainly developed inside this zone, the tourist industry localized itself within the vicinity of the main attractions too. This concentration has been advocated by the City Council, who have actively confined the development of new tourist facilities to the main tourist area. This concentration model was meant to alleviate the social pressure of tourism on the local population and led to the development of the 'golden triangle', an area approximating just four square kilometres in size and containing all the major tourist functions of the city.

It goes without saying that the sizeable number of visitors, combined with the limited spatial area and the seasonality of the destination, with most visits taking place in the period May to October, has important implications for the social situation in Bruges (Toerisme Vlaanderen, 2010). Especially since Bryon (2005) remarks that at some days over 30,000 tourists frequent the city and the majority of tourists limit their visit to just over one square kilometre. It can be assumed that the density in the city centre can have an influence on the tourist experience. Therefore Bruges forms an excellent study area. The case could be seen as a good example for other popular tourist-historic cities with a spatially limited core area.

Study Methods

Between 20 October 2007, and 3 November 2007 a stratified street survey was conducted in the inner city of Bruges. Stratification was applied to divide the sample between visitors from primary markets – Belgium, the United Kingdom, France, the Netherlands, Germany and Luxembourg – and secondary markets, and led to the surveying of a total of 422 tourists, split according to a 75-25 per cent division between primary and secondary originating countries.

Since several variables were of a qualitative nature, use was made of sets of measurement items to construct the underlying dimensions. Apart from these variables, a number of categorical and ratio variables could be measured directly. In addition, crowding perception was measured using a single 9-point crowding scale, as proposed by Shelby et al. (1989).[1] An extra evaluative question, on a 5-point Likert scale, was added to measure respondents' valuation of the crowding level. Apart from this crowding scale, which measures feelings about the situation as observed by the respondent, a separate photographic method was used to evaluate the preference for a certain use-level (see the photographs in Appendix 1). This method is advocated by Hall and Roggenbuck (2002) because of its apparent larger validity and ease of interpretation. The daily number of tourists was estimated by multiplying the visitors to the tourist office in Bruges by 4.19, a number that was deduced by using previous information about tourist visits to the information office (Stad Brugge, 2005). This method gave reasonable estimates of between a maximum of 15,849 tourists on 2 November and a minimum of 5,539 visitors on 26 October. The total city area visited by the respective tourists was approximated by mapping the visited attractions. Table 1 gives an overview of these variables.

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[1] On this scale, the values 1 and 2 indicate 'not at all crowded', the levels 3 to 5 'not very crowded', 6 and 7 'crowded', and 8 to 9 'very crowded' (Shelby et al., 1989).

Table 1 Variables Measured in the Survey and Their Measurement Level

Variable	Measurement level	Measurement items
Tourist experience	Ordinal (scales 1-5)	4
Tourist expectations	Ordinal (scales 1-5)	6
Travel Motive	Ordinal (scales 1-5)	13
Behaviour of others	Ordinal (scales 1-5)	6
Openness towards others	Ordinal (scales 1-5)	6
Gender	Categorical	
Nationality	Categorical	
Intensity of contact	Categorical	
Place of contact	Categorical	
Length of stay	Ratio	
No. of others	Ratio	
No. of attractions visited	Ratio	
City area visited	Ratio	
Crowding perception	Ordinal (scale 1-9)	
Evaluation of crowding level	Ordinal (scale 1-5)	
Preference for use level	Ordinal (scale 1-5)	

Subsequently, the measurement items representing the variables 'tourist experience', 'tourist expectations', 'travel motive', 'behaviour of others', and 'origin of others' needed to be transformed into their latent constructs. Apart from 'travel motive', which was considered multifactorial, all other measurement items were hypothesized to be unifactorial. The appropriateness of the use of factor analysis was tested and found acceptable, with a sufficient amount of correlation according to a visual check of correlations and Bartlett's test of spherity ($p = .000$ for all variables), the apparent absence of multicollinearity, and sufficient Kaiser-Meyer-Olin statistics (between .573 and .776 for all variables) (Field, 2009). Principal Components Analysis was chosen as extraction method and resulted in a four-factor outcome for the variable 'travel motive', with a total amount of variation explained of 55.6 per cent, giving rise to four distinguishable motives: non-leisure; culture tourism; consumption-based tourism with a preference for eating, drinking and shopping; and tourism for romantic reasons. This last group, however, only consisted of one observation and was therefore removed from the analysis. The other variables all proved sufficiently unidimensional.

Next, the reliability of the latent constructs was tested. The preferred test statistic was the ordinal reliability theta, as proposed by Zumbo, Gadermann, and Zeisser (2007), since Cronbach's alpha is, in general, a negatively-biased estimate of reliability (Raykov, 1998), especially in the case of ordinal data. For a number of latent variables the ordinal reliability theta could not be calculated due to a limited number of measurement items (<3) or the non-convergence of the polychoric correlation matrix. In these cases, Armor's reliability theta was used as a next-best solution (Armor, 1974). The latent variables were found sufficiently reliable and theoretically important to keep in the analysis.

Table 2 Reliability Coefficients After Item Exclusion

Latent variables	Reliability
Tourist experience	.617°
Tourist expectations	.429*
Non-leisure tourism	.914*
Culture tourism	.638°
Consumption-based tourism	.615*
Behaviour of others	.891*
Origin of others	.637*

* Ordinal reliability theta
° Armor's reliability theta

Apart from the data simplification concerning tourist motives, a second necessary reduction concerned the nationality variable, because the different nationality groups needed to contain sufficient observations for statistical analysis. It was chosen not to use

cluster analysis to identify different homogeneous groups because this would implicitly create groups to support the theoretical construct. That is: a significant influence between nationality and the dependant variable of crowding would be found just because cluster analysis formed these groups to support this difference. Therefore, it was ultimately chosen to intuitively construct nationality groups based on their geographical location and taking into account the number of observations; creating three clusters: Europe, America-Australia, and Asia.

The significance of the independent variables on crowding perception could then be tested by use of logistic regression. Since multinomial logistic regression would lead to a multitude of empty cells, as a result of the many levels of the dependent variables, it was decided to alter the measurement level of the perception of crowding by reducing the perceived situation to 'not crowded' (1 to 5 on the crowding scale) or 'crowded' (6 to 9 on the crowding scale). This transformed the statistical problem into a binary logistic level. However, before using this method it had to be tested whether the data allowed for such a statistical technique. As Field (2009) notes, logistic regression requires linearity, independence of errors, and no high correlation between independent variables. The assumption of linearity between any continuous independent variable and the logit of the dependent variable was tested by analysing the significance of the interaction term between the independent variable and its log transformation (Hosmer & Lemeshow, 1989). Significance levels of the interaction terms were above .05, indicating that the assumption of linearity was met. Independence of errors was analysed using the Durbin-Watson test statistic (1.091), and the possibility of multicollinearity was assessed by the tolerance (all above .1) and VIF statistics (all bellow 10) and this proved that the necessary assumptions were met to use binary logistic regression.

In order to test the hypothesis concerning the affective loading of crowding, measures of association were used, which look into the relationship between a certain crowding level and the feeling this level invokes. First, the original unsimplified 9-point crowding scale was correlated with the evaluation question of a crowding level through a Spearman rank correlation, as a bivariate measure of association between two ordinal variables. Next, the possible mediating influence of preferences on the relationship between the crowding observation and its affective evaluation was accounted for. However, since preferences were measured via the photographic question, consisting of five photographs, while crowding perception was determined via the 9-point crowding scale, it was necessary to rescale both questions into a comparable measurement level. This was done by attaching the labels of Shelby et al.'s (1989) crowding scale to the different use-levels shown on the photographs. The remodelled data was then examined using a stratified cross-table analysis, with the exact Mantel-Haenszel Chi-square testing for independence between two variables (i.e. crowding perception and affective evaluation) under different categories of the control variable (i.e. preference for use-level), and the Gamma measure of ordinal association which assesses the strength of a possible relationship.

Results and Discussion

The binary logistic regression resulted in just four significant explanatory variables: 'Number of others', 'Asian nationality', 'Behaviour of others', the 'Culture tourism' travel motive, and a constant. The Chi-square statistic, which tests the null hypothesis that the prediction power of the explanatory variables is not significantly different from the null model, has a value of 99.927 and a p-value of .000, which leads to the rejection of the null hypothesis, proving the significance of the explanatory variables. Cox and Snell R^2 (.211) and Nagelkerke R^2 (2.85) give an indication about the strength of the association between the dependent and independent variables and show at least a modest association in our model. The Hosmer and Lemeshow goodness-of-fit test tries to find whether there is a difference between the observed values and predicted values of the dependant. With a Chi-square value of 7.466, and p-value of .487 the null hypothesis cannot be rejected, meaning that a satisfactory model fit can be assumed. This can also

be observed from the prediction power of our model, which shows a correct prediction in 71.6 per cent of cases. Field (2009) also notes the importance of examining the residuals when testing the model's value. Cook's distance values are all well below one, which means that there are no influential cases affecting the model. The distribution of standardized residuals does not indicate problems either, while all DFBetas are less than one. Therefore, there is no reason to doubt our model, and we can continue with the interpretation of the coefficients.

Table 3 Results for Binary Logistic Regression for Crowding in Public Space

	B (SE)	Lower 95% CI	Odds Ratio	Upper 95% CI
Included:				
Constant	-3.161 (.561)		.042	
Number of others*	.153 (.034)	1.092	1.166	1.245
Nationality (Asian)	2.226 (.504)	3.453	9.266	24.863
Behaviour of others	.498 (.129)	1.277	1.645	2.120
Culture tourism	-.597 (.133)	0.424	.551	0.715
Chi-square for model (p-value) = 99.927 (.000)				
Chi-square for Hosmer & Lemeshow (p-value) = 7.466 (.487)				
Cox & Snell R² = .211				
Nagelkerke R² = .285				

* measured by thousands

The cultural travel motive has a negative regression weight, revealing a lower feeling of crowdedness among tourists who travelled to the destination because of cultural interests. This might be explained through social interference theory (Patterson & Hammitt, 1990). As Lee and Graefe (2003) note, social interference assumes that much of the visitor's behaviour is motivated by the desire to accomplish a certain goal, often embodied by the travel motive to visit a certain destination. Because of their specific activity pattern cultural tourists could be less susceptible to crowded situations since it is more likely that disturbance from use numbers may be experienced when confronted with long waiting times at restaurants, than when visiting a museum or walking through the historic centre of a city. The behaviour of other tourists shows a clear positive connection, explained by the construction of this variable, where a higher value is a sign of having observed disturbing behaviour. The logical consequence is a higher perception of crowding, which is statistically underpinned here. Significance of nationality is found for the difference between Asian and non-Asian tourists. The positive regression coefficient supports the findings of Gillis et al. (1986) and Yagi and Pearce (2007), which state that, in general, Asian tourists are less susceptible to crowding than Western tourists because of cultural differences in perception of social use level. Finally, the number of other tourists at the destination had a positive influence on crowding perception, even though this influence was limited compared with the other variables.

The most interesting outcome lies with the calculated odds ratios, which are similar to the regression coefficients but do not require a logarithmic transformation to be interpreted. If greater than one, these show that the odds of perceiving a situation as crowded increase together with an increase of the variable, while a value lower than one indicates that the odds of crowding perception decrease for an increase in the independent variable. Table 3 shows how the probability of indicating a situation as crowded is over nine times higher when a respondent is non-Asian. Observing disturbing behaviour of others also increases the odds by 1.645. Interestingly, the number of others present (measured by thousands) has the smallest effect on the odds, with the presence of one thousand extra tourists only increasing the odds of crowding perception by 1.166. The fact that the number of tourists at the destination only had a minor influence on crowding perception could possibly be attributed to a non-linear relationship between number of tourists and perception of crowding. According to McCool and Lime (2001) the impacts of tourism are already visible at low use-levels, whereby the marginal impact decreases when visitor numbers rise. This implies that for destinations with higher numbers of tourists, the decrease (or increase) needs to be very drastic before a highly

significant effect on crowding can be found. As indicated earlier, the cultural travel motive, having an odds ratio lower than one, lowers the odds of feeling crowded by .551.

It is also interesting to look at the variables which were not included in the model. Most surprisingly, both tourist experience and tourist expectations did not show significance. It could be assumed that travel expectations fall short of significance due to the different approach taken in this study. Contrary to Lee and Graefe (2003), who did find a relationship, our definition assessed the extent to which expectations were met with respect to a number of fields, not only use-level. Another possible explanation for both the non-significance of tourist experience and tourist expectation could be that experience with, and expectations of, use-level are more related to the cultural background and home experience of the tourists, embodied by nationality, than by their pure travel experience. Alternatively, it could be noted that most tourists coming to Bruges already had some relevant experience, and therefore more realistic expectations. So, even while there was variation in experience and expectations, the range of values might not have been sufficient to explain differences in crowding perception. The same can be said about the relationship between the city area visited, the number of attractions visited, length of stay, and the place of contact, on the one hand, and crowding perception, on the other, since it was observed that the large majority of tourists had a very limited use-pattern across the city, restricting themselves to the core area and most important attractions, while most contact was confined to public spaces. This might also explain the insignificance of length of stay as an explanatory variable. While not consistent with Russo's (2002) theory of the vicious circle of tourist development, where he states that day visitors often concentrate their attention on the central locations and most famous attractions, elevating crowding perception in those places, or Westover's (1989) theory that longer exposure time to crowding might lead to the development of evasive strategies, the physical limitedness of our study area could serve to mitigate the possible difference in space use between day visitors and overnight tourists. Finally, the non-significance of the intensity dimension could be explained by assuming that the open setting of urban public spaces does not facilitate interaction with others, apart from one's own group members. While more confined settings might invite more intense and personal contact with other tourists, the contact within public space is mainly limited to visiting the same area.

After identifying the variables that significantly influence crowding perception, the hypothesis was tested whether a crowding perception would necessarily lead to a negative sentiment. As explained previously, most studies presume that the word 'crowding' has an intrinsic negative connotation, which would mean that, based on the semantic construction of the 9-point crowding scale, every level above five (i.e. 'crowded' and above) constitutes a stress situation.[2] Applying this cut-off point, the percentage of tourists reporting a high crowding score was 75.8 per cent, while the mean value of the crowding level reported, amounted to 5.71 out of a maximum of nine. To analyse the results of this crowding perception, the 5-point ordinal evaluative question could be used, assuming that, by stating a negative feeling about the perceived use-level, the tourist experience would diminish. The results showed that no less than 54.7 per cent perceived the crowding level as either positive or very positive. A minority of 18.3 per cent reported a negative feeling. However, the effect of crowding on the evaluation standard can only truly be identified by combining the 9-point crowding scale and the 5-point evaluative question. Using a Spearman rank-order correlation, this relationship was found significant with a correlation value of -.269 (p=.000), meaning that as the perceived crowding level rises the situation will be valued more negatively. This observation statistically proves a relationship between crowding level and the tourist experience, if it is assumed that a negative feeling diminishes the tourist experience. Nevertheless, the Spearman rank-order correlation does not account for possible underlying interactions, and therefore a further analysis also took the preferred use-level of the respondent into account. A

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[2] Shelby et al. (1989) propose that a higher cut-off value of seven (i.e. 'very crowded') should be used to represent detrimental levels of crowding in high use settings. However, this assumes that lower levels of crowding do not have negative effects. This contradicts the idea that any level of crowding is perceived negatively.

layered cross-table was used together with an exact Mantel-Haenszel Chi-square to test whether the relationship between crowding and tourist experience – as previously found – was mediated by preference. Two connections showed significance: a preference for very low to low use-levels, combined with a higher observation of crowdedness, led to a more negative evaluation. The corresponding Gamma-coefficients had values of -.483 (p=.000) and -.0374 (p=.000), respectively, showing that tourists with a liking for the lowest use-levels were influenced to a greater extent by non-conformity to their preferences.

It can therefore be concluded that a significant negative relationship between crowding perception and tourist experience could only be found for tourists who preferred low use-levels. This means that a higher than preferred observed use-level more often led to a negative valuation than when use-levels remained below favoured conditions. However, this does not imply that the concept of crowding could therefore rightly be considered negative as such. On the contrary, the majority of respondents who perceived a certain crowding level did not report this as being negative. Therefore, our hypothesis could not be rejected, holding important implications for future research, since previous studies often theoretically assumed crowding to be negative (e.g. Canestrelli & Costa, 1991; Saveriades, 2000; Shelby et al., 1989; Tarrant & English, 1996; van der Borg, Costa, & Gotti, 1996).

Conclusion

Crowding is a concept often thought to be largely psychological and intrinsically negative, linked to the violation of a personal norm. However, general crowding research mainly receives its theoretical background from animal studies or environmental design experiments, while the more specific tourist crowding studies by and large focus on recreational outdoor settings. While it could be argued that crowding in backcountry destinations will indeed be a source of stress and of a diminishing tourist experience, its role in the satisfaction of tourists within an urban destination is still largely unknown. If crowding is, as theorized by many authors, indeed a negative affect, then the normative response to a crowding situation should not differ within settings of a different nature. However, even in crowding studies taking place in backcountry destinations, the relationship between crowding and tourist experience, as far as it is not taken as a priori in the research design, is not found to be very significant. This leads us to question the appropriateness of the existing crowding research framework, especially when used in an urban tourist destination, with naturally larger use-levels.

First of all, the perception of crowding was modelled by including the interactions with a diversity of variables. The resulting statistical analysis found a significant relationship between crowding perception, on the one hand, and the behaviour of other tourists, the travel motive 'cultural travel', nationality, and number of tourists, on the other. Strikingly, and consistent with previous research findings, personal characteristics seemed much more important in determining crowding perception as compared with situational factors, nationality being the most important. These findings might suggest that, at least as far as the perception of crowding in an urban environment is concerned, the home experience and its cultural values are most important in the interpretation of use-level in a tourist destination.

Once the variables influential in the construction of the crowding concept were found, the next step involved the relationship between this level of crowdedness and the travel experience. While, a significant positive correlation was found between the perceived crowding level and the subsequent evaluation of the situation, further analysis showed the importance of preference in this relationship, indicating that significance could only be found for tourists who favoured very low to low use-levels. The majority of people who observed high use-levels did not give a negative normative evaluation to the situation. If, as is shown in our results, crowding can also be considered positive, then the concept itself cannot be explained by personal norm theory. It is our belief that personal norms will act to influence the normative evaluation of a certain crowding level,

while the pure observation and identification of a crowding situation can take place on a cognitive level.

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Appendix 1

Picture 1: Shelby et al.'s (1989) crowding scale level 1

Picture 2: Shelby et al.'s (1989) crowding scale level 2

Picture 3: Shelby et al.'s (1989) crowding scale level 3-5

Picture 4: Shelby et al.'s (1989) crowding scale level 6-7

Picture 5: Shelby et al.'s (1989) crowding scale level 8-9