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The density–satisfaction relationship revisited: The role of scarcity and consumers affective reactions in a crowded retail situation

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ABSTRACT

This article examines how individuals react in crowded utilitarian settings and investigates the specific role of scarcity in the density–dissatisfaction relationship. This paper also highlights the mediating role of affective states (i.e. positive and negative) in determining consumers' satisfaction or dissatisfaction in these contexts. The results suggest that the scarcity of the situation can reduce the extent to which consumers perceive negative experiences in a dense retail situation. In addition, it supports the critical role played by affective states in mediating the relationship between density perceptions and negative reactions. The article provides potential explanations and managerial insights on how managers can deal with crowding in diverse retail and services situations.

1. Introduction

Crowding is often described as an important environmental factor in consumers' evaluations of service experiences (Eroglu and Harrell, 1986; Eroglu and Machleit, 1990; Harrell et al., 1980; Machleit et al., 2000; Rollo et al., 2009). Most of these studies underline negative consequences for consumers triggered by crowded situations (Eroglu and Machleit, 1990; Grewal et al., 2003; Machleit et al., 1994). Additionally, from a managerial standpoint, crowd management has become a growing concern. Solutions are increasingly needed to solve problems of over-capacity during service encounters such as attractions or national parks (Eastman and Land, 1997; Manning and Valliere, 2001).

Several studies (Eroglu et al., 2005; Machleit et al., 2000; Rosenbaum and Massiah, 2007; Tombs and McColl-Kennedy, 2003) suggest that the negative relationship between crowding and satisfaction, traditionally occurring in crowded encounters, may not be as simple as commonly accepted. For instance, these studies underline the importance of considering crowd origins (human: too many people vs. spatial: too little space) when interpreting results on crowd impact. They also insist on the potential moderating role of the service encounter and the shopping values at stake (leisure vs. utilitarian) as well as the mediating role played by affective states in these situations (Cottet et al., 2006; Eroglu et al., 2005; Hui and Bateson, 1991). These findings reinforce the need to consider situational variables when studying the relationship between density and satisfaction.

One potential variable that has received a relatively limited attention from researchers (Byun and Sternquist, 2012; Lynn, 1992; McGrath and Otnes, 1995; Parker and Lehmann, 2011; Tombs and McColl-Kennedy, 2003) is the extent to which the service or retail situation itself represents a scarce event for the consumer (e.g. Boxing Day, Clearance sale, grand opening, etc.). For instance, scarce shopping situations often seem to have a greater value for consumers and trigger more extreme behaviors (Holt, 1995; Madrigal, 2000; Wann et al., 2004; Wu et al., 2012). Other studies also suggest that individuals may have more preference for scarce products (Snyder, 1992; Tian et al., 2001) and are more likely to choose scarcer products (van Herpen et al., 2009). This scarcity effect has been largely described by social scientists (Walster et al., 1973; Williams et al., 1993) and economists (Leiss, 1976; Raiklin and Uyar, 1996) but more recently mentioned by marketers (Cialdini, 1995; Parker and Lehmann, 2011; Tombs and McColl-Kennedy, 2003; van Herpen et al. 2009; Wann et al., 2004).

In this context, the objectives of this study are twofold. First, the study aims at exploring the potential role that scarcity may play in crowded utilitarian retail situations. Second, it aims at clarifying the role played by affective reactions in the process leading to satisfaction/dissatisfaction in dense situations.

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2. Literature review

2.1. Crowd, density and affective reactions

As early as 1981, Booms and Bitner (1981) included people as important actors of a service delivery in their seven Ps conceptualization. In addition to traditional customer-provider interactions (Shostack, 1985), several researchers (Grove and Fisk, 1997; Iacobucci, 1998; Zeithaml et al., 2006) suggest that customer to customer interactions are in some circumstances key determinants of customer satisfaction (Bitner, 1992; Wakefield and Blodgett, 1994; Wu, 2007). In this line of research, interactions between customers are depicted as noises or disturbances occurring during the service or retail delivery (Hui et al., 1998, 1997; Schmidt et al., 1992; Whiting, 2009). This negative impact of other customers during the service/retail experience occurs when rude or unexpected behaviors from co-consumers spoil the nature of the experience; or, at a more aggregate level, when a high density of people (crowd) induces negative cues that alter this experience.

The previous retailing research made the distinction between density and crowding (Eroglu and Harrell, 1986; Eroglu and Machleit, 1990). "Density is the perception and estimate of the number of people present in a given area, the space available, and its organization, whereas crowding (which we could call affective density) is the evaluation or the judgment of that perceived density against certain standards, norms, and desired levels of interaction and information" (Rapoport, 1976, p. 136). Therefore, density plays an essential role in the evaluation of crowding and is a necessary antecedent for the experience of crowding (Pons and Laroche, 2007; Stokols, 1972; Whiting, 2009). Studies dealing with the impact of crowds in service settings support the negative impact of crowded situations on consumers' experiences (Machleit et al., 2000, 1994). Previous research demonstrated consequences on shopping satisfaction (Eroglu and Machleit, 1990; Li et al., 2009), time spent in the store (Byun and Mann, 2011; Harrell et al., 1980) and purchase intentions (Machleit et al., 2000; Wakefield and Blodgett, 1994). Indeed, in crowded situations, consumers can modify their initial plans and this can result in spending less money, leaving the store without making any purchase (Harrell et al., 1980) and avoidance behaviors (Eroglu and Machleit, 1990; Pons et al., 2006).

This consumer response to density is influenced by several factors such as personal factors, expectations, tolerance for crowding, and shopping motivation (Baker and Wakefield, 2012; Eroglu et al., 2005). For example, individuals' expectations regarding the level of density in the store can influence their perceptions of crowding (Machleit et al., 2000; Pons and Laroche, 2007). Also, they can develop different expectations depending on the store format and retail concept (Byun and Mann, 2011).

Previous research also demonstrated that the retail context can influence how individuals perceive density. Indeed, density triggers more negative consequences in task-shopping context (Eroglu and Machleit, 1990) and more utilitarian setting (Eroglu et al., 2005; Hui and Bateson, 1991; Noone and Mattila, 2009). In goods setting, the preferences of consumers follow a curvilinear pattern. There seems to be an inverted-U relationship between the level of density and the satisfaction (Eroglu et al., 2005). Indeed, consumers prefer a medium level of density in a store compared to a low or a high degree of crowding (Pan and Siemens, 2011).

Crowding models and theories present different mechanisms that explain the negative effects of density on individuals. First, high density will result in diverse behavioral constraints that will interfere with goal obtainment, restrict possible movements and reduce freedom (Stokols, 1972). Second, individuals will experience stress from the lack of control over the situation (Dion, 2004; Evans and Lepore, 1992; Schmidt and Keating, 1979). Indeed, dense environments are less predictable and consumers feel reduced control over its own experience. Their behaviors and decisions in the shopping situation are highly influenced by others (van Rompay et al., 2008). This phenomenon seems to be related to the information overload that people experience when the process the different information (Eroglu and Machleit, 1990). Finally, density will cause excessive stimulation that overwhelms sensory systems, as a result of causing overload and arousal (Evans and Lepore, 1992) and trigger unpleasant outcomes like stress, anxiety and discomfort for the individual (Baum and Epstein, 1978; Lepore, 2012; Paulus et al., 1985). Indeed, dense situations seem to decrease positive affect (Hui and Bateson, 1991; Machleit et al., 2000) and increase tension (Stokols, 1972). Previous studies in environmental psychology dealing with affective reactions to shopping environments also underline the key role of these affective states in explaining future behaviors (and satisfaction) with service encounters (Chebat, 2002; Oliver, 1997). Therefore, building on the Stimulus-Organism-Response (S-O-R) paradigm in which characteristics of the environment (density in this case) lead to approach-avoidance responses through affective reactions of the individual to the environment itself (Donovan et al., 1994), we hypothesize that affective states triggered by the dense situation will mediate the relationship between perceived density and satisfaction in a utilitarian retail situation (Machleit et al., 2000). As this mediating role lacks clear empirical support, our first hypothesis will evaluate the potential mediating role of positive and negative affective states in a utilitarian retail situation encounter.

Hypothesis 1. The higher the perceived density, (a) the lower the consumer's positive affect and (b) the higher the consumer's negative affect.

Hypothesis 2. (a) Positive affect has a positive influence on satisfaction and (b) Negative affect has a negative influence on satisfaction.

2.2. Scarcity and the density–satisfaction relationship

Services and by extension retail experiences have often been described (and distinguished from goods) in terms of inseparability, heterogeneity, intangibility and perishability (Iacobucci, 1998; Zeithaml et al., 2006). Services are simultaneously produced and consumed, and therefore cannot be stored until a point in time of greater demand. In fact, if the consumption act is postponed, the consumer has no guarantee that his/her next experience will be what she/he was expecting on the first occasion. In the case of special events such as new store openings or special and limited offers such as Boxing Day sales, a notion of rareness or scarcity of the experience is introduced. These events are only held on a limited number of occasions, thus creating potential restriction on accessibility and a demand that exceeds the offer (Lynn, 1992).

The concept of scarcity roots in economics. In fact, "*the concept of scarcity is the cornerstone of economics as a discipline*" (Raiklin and Uyar, 1996, p. 49). In the economic sense, scarcity represents the disparity between our wants and production capacities (Leiss, 1976). This production-based definition of scarcity may appear far-fetched in shopping situations; however, studies pertaining to the experience economy (Lebergott, 1993; Pine and Gilmore, 1998) broaden the definition of scarcity to include offerings that provide attractive alternate ways to spend the increasingly scarce consumers' time (Holbrook, 2000).

In business literature, scarce goods and services appear to be more valuable and to increase consumer desire to own them (Aggarwal et al., 2011; McGrath and Otnes, 1995; Wann et al., 2004; Wu et al., 2012). Cialdini (1995) describes this phenomenon as the *"scarcity effect"* in which consumers have a tendency to acquire products that are scarce or are becoming scarcer. Empirical

supports of this effect are limited and mainly deal with entertainment events such as sporting (e.g. NBA finals) or cultural events (e.g. concerts). In these cases, consumers are willing to compromise key aspects of their decision-making process such as waiting costs or comfort or spending, in order to have access to special or exclusive events (Byun and Sternquist, 2012; Eastman and Land, 1997). Consumers seem to appreciate the value that can be gained through playing the scarcity game (Eastman and Land, 1997; Eisend, 2008). This value may be derived from gaining status (compared to others) but also from a true passion for a unique situation (connoisseur) (Bhattacharya, 1998).

Scarcity has often been described as rationale to explain high consumer density levels (crowds) (Eisend, 2008; Holt, 1995; Mittone and Savadori, 2009; Tombs and McColl-Kennedy, 2003). We propose in this paper that scarcity is more than a simple trigger of crowded situations. It can also offer an added value to the consumer. Therefore, an adequate combination of scarcity and density may reduce both the negative impact of a dense shopping situation on positive affect and the positive impact of density on negative affect. Consequently, we posit:

Hypothesis 3. Scarcity is a moderator of the relationship between density and affective reactions.

Hypothesis 3a. In a scarce utilitarian shopping situation, the negative influence of density on positive affect will be weaker than in a non-scarce situation.

Hypothesis 3b. In a scarce utilitarian shopping situation, the positive influence of density on negative affect will be weaker than in a non-scarce situation.

Hypothesis 3c. In a scarce and dense service encounter, consumers are more satisfied than in a non-scarce and dense shopping situation.

2.3. Crowd and density typology: does it change anything?

Several typologies have been suggested to explain potential differences in reaction to high consumer density levels. For instance, Stokols (1972) and Altman (1975) introduced a distinction between social and non-social density. In the former, high density is due to the presence of many individuals in the setting whereas in the latter, high density stems from restrictive physical characteristics of the setting. Both situations lead to high density situations, but the origins of the density levels are different. A similar typology is used in marketing literature with a distinction between human and spatial crowding (Machleit et al., 1994). Results generally show some differences due to the type of crowding (human vs. spatial) perceived by the individual, but researchers call for more studies using this framework (Machleit et al., 2000). In general, spatial crowing is related to nonhuman elements (e.g. amount of merchandise and fixtures) in the environment and their relationships to each other, while human crowding comes from the number of individuals and the social interaction among the people in the store (Machleit et al., 2000). Spatial crowding implies shoppers' impressions of restrictiveness of physical body movement within limited customer space. Human crowding refers to the numbers of shoppers participating in the selling and retailing activities (Li et al., 2009). Literature demonstrates that human crowding is the most important component of crowding (Michon et al., 2005).

Using this framework and the argument suggesting that shoppers may establish the value of a store through the number of shoppers or other environmental cues (Machleit et al., 2000; Mattila and Wirtz, 2008), we hypothesize that scarcity may affect human and spatial crowding in a different way. Indeed, in the case of scarce events and, as consumers usually expect a crowd, we anticipate that they will not perceive as much human crowding as spatial crowding. In fact, the negative affective reaction to the physical space per se may not be reduced by the perceived scarcity whereas the human density may. Therefore, we can posit:

Hypothesis 4. In a scarce and dense shopping situation, (a) perceived human crowding will be lower than in a non-scarce and dense shopping situation whereas (b) perceived spatial crowding will remain unaffected in both situations.

3. Methodology

3.1. Research design and sample

In this study, the level of scarcity (scarce vs. non-scarce) and the density level (high vs. low) were manipulated independently, and their effects were studied. Written scenarios and video stimuli were used to operationalize these variables. Previous research (Machleit et al., 2000) suggests that using videotapes to recreate a given crowded retail situation produced valid consumer responses. In addition, the authors also advocate for the effective use of role-playing scenario techniques following environmental psychology methods (McClelland and Auslander, 1975). This approach may have limited external validity, but allow to overcome potential limits regarding experimental designs for the study of crowding issues. The scenarios were written by the researchers, reviewed by experts and pre-tested. The video stimuli were shot in different shopping situations and edited by a professional to create different levels of density. Several sites were visited and pre-tested using small groups of consumers to assess their shopping values. The most utilitarian shopping situation was selected for this study (university bookstore) (Babin et al., 1994). All scenarios and videos were also pre-tested. Four groups were necessary to implement the experimental design. 30 introductory business courses with at least 30 registered undergraduate students were randomly selected. The final sample had 860 respondents (4 groups of 215 respondents).

The situation chosen (i.e. utilitarian) was identified through pretests among students. 153 students were asked to rate six situations (bar, restaurant, hockey game, mall, bank and bookstore) using the hedonic side of the hedonic and utilitarian shopping values scale (Babin et al., 1994). The situation with the lowest (bookstore) average score was significantly different on a seven-point Likert scale ($M_{bar}=6.2$ vs. $M_{bookstore}=3.1$; $F_{(1,151)}=95.52$, $p<0.001$). Therefore, a bookstore situation was adopted for the final study. It is important to notice that the bookstore situation was presented as a university bookstore where students go to purchase books and not a place to hang out like a coffee shop. Cues about the shopping situation were given in the written scenario that was read and distributed to the consumer.

The level of scarcity of the service situation encountered by the respondents was manipulated through written scenarios. Wording was made in such a way that the scarcity level should vary as expected. In the scarcity scenario, participants are mentioned that the bookstore has exclusive sales days and the access to the bookstore is restricted to students registered in their department. The statements were also pretested along with the other manipulated variables. A convenience sample of 30 students was asked to read the corresponding scenarios and to picture themselves in the described situation. Results showed a significant difference in the aggregated average score of measured scarcity between the scarce versus non-scarce situations ($M_{scarce}=5.1$ vs. $M_{non\text{-}scarce}=3.3$; $F_{(1,62)}=21.76$, $p<0.001$).

3.2. Procedure

A self-administered questionnaire was used to gather the data. First, students had to answer questions pertaining to general personality trait measures. Then, a scenario describing a service encounter was presented. The researcher read it aloud while students could also read it. They were then asked to picture themselves in the situation just described; this point was emphasized. In addition, they were told that they were about to enter the setting previously described. Then, a short 1-min video, depicting the situation previously described, was presented two times. Students were told to look carefully at the video and to imagine themselves in the service setting they could see in the video. After viewing the video, the students had to complete the questionnaire. Subjects were then debriefed, thanked and dismissed.

3.3. Measures

A self-administered questionnaire was used to gather the data. All the items were measured on a seven-point Likert scale. The perceived density level was measured using an estimation of the number of people in the encounter (video) as well as a single item attempting to capture the overall perceived density level (Lynn, 1992; Stokols, 1972). Perceived human and spatial crowdings were measured using Machleit et al.'s (1994) scale. In addition, items capturing negative and positive affective states were respectively measured using the following items: cheerful, relaxed, content, angry, irritated, and upset (Bohner et al., 1993; Krahé and Bieneck, 2012). Finally, satisfaction was measured for the overall service experience as suggested by Oliver (1997). Items were borrowed from his consumption satisfaction scale and Machleit et al.'s (1994) scale. Several additional manipulation-check measures were also introduced to ensure similarity between respondents and characters in the video or believability of the situation. All items were adapted to the university bookstore situation.

4. Results

4.1. Structural relationships: evaluation of the density–satisfaction relationship

Using structural equation modeling, this section explores the direction and strength of the relationship that ties perceived density to consumer satisfaction. More specifically, it aims to identify the role played by positive and negative affect in this relationship. The model described in Fig. 1 was applied to the overall sample. In a second round of analyses, the moderating effect of scarcity was analyzed using multi-group comparative studies.

4.1.1. Preliminary analyses and measurement issues

Prior to the full model specification, including causal path relationships, a series of analyses were performed on each latent variable (density, positive and negative affect and satisfaction) used in the model to determine their psychometric properties.

Results from exploratory factor analyses suggested adequate dimensionalities and satisfying reliability indicators for each factor present in the model (all Cronbach alphas above 0.85). Moreover, confirmatory factor analyses performed on these latent variables indicated a reasonably good fit to the data, thus, confirming the quality of the measurement model and the start of the structural model's evaluation.

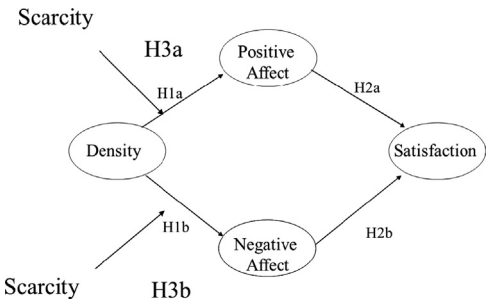

Fig. 1. Density–satisfaction relationship model.

4.1.2. Model evaluation

The model was applied to the entire sample (860 respondents) to check for overall patterns of relationships. The hypothesized model's Chi-square is 27.35 with 15 degrees of freedom (χ^2/df = 1.83). The CFI is 0.956 and the RMSEA is 0.058. This supports the good fit quality of the overall model (H1a, H1b, H2a and H2b are supported). The EQS standardized estimates of the parameters and their respective *t*-values are presented in Table 1. As shown, all of the structural relationships but one are significant at $p < 0.001$ (*t*-value > 1.96; Anderson and Gerbing, 1988).

It is important to note that a direct path between density and satisfaction was also tested. This path was not significant, and therefore, the results support the mediating role played by positive and negative affects in the relationship between density and satisfaction. There are general recommendations for testing mediation (MacKinnon et al., 2002). Even though, Structural Equation Modeling is now a commonly used method for mediation analysis (Frazier et al., 2004), the Sobel test remains a traditional method of testing the significance of mediation effects. Therefore, using our structural models the significance of the mediation effects were assessed using the Sobel test. SEM provided the standardized regression coefficients and the standard deviations and the *z*-values provided the Sobel tests for each positive and negative affect as mediators. *Z*-values were respectfully 22.2 and 19.3, $p < 0.000$ and support the significance of these mediation effects. The results are also consistent with the crowding studies within the realm of negative consequences (Hui and Bateson, 1991; Machleit et al., 2000).

4.1.3. Testing the potential moderating effect of scarcity on the general model

Multi-group analyses are used to compare the general model across scarce situations. First, measurement equivalence across the two groups (scarce vs. non-scarce) is confirmed through configural and metric invariances (Steenkamp and Baumgartner, 1998). Then, hypotheses 3a and 3b are tested by fitting a structural model in which all the parameters of the causal structure are constrained to be equal across the two groups. The results suggest the release of two of the four constraints, supporting a limited similarity in terms of structural coefficients between the two groups. The identical paths across the two groups are the influences of positive and negative affective state on satisfaction. With the release of the non-fitting constraints, the model is re-evaluated. The final indicators ($\chi^2 = 21.12$ with 13 df, χ^2/df = 1.63, CFI = 0.963 and RMSEA = 0.056) suggest a fairly good fit to the data and a significant

Table 1
Standardized estimates for the density–satisfaction general model.

Path Tested	Standardized Estimate (*T*-Value)
Density → Positive affect (Hypothesis 1a supported)	−.51 (−9.02)
Density → Negative affect (Hypothesis 1b supported)	.31 (5.84)
Positive affect → Satisfaction (Hypothesis 2a supported)	.55 (9.7)
Negative affect → Satisfaction (Hypothesis 2b supported)	−.22 (−4.31)

Table 2
Standardized estimates in the two scarcity levels.

	Not scarce	Scarce
Path Tested	**Standardized Estimate(*T*-Value)**	**Standardized Estimate(*T*-Value)**
Density→Positive affect (Hypothesis 3a supported)	−.59 (−9.8)	−.24 (−4.7)
Density→Negative affect (Hypothesis 3b supported)	.41 (7.3)	.21 (4.0)
Positive affect→Satisfaction	.55 (9.4)	.54 (9.2)
Negative affect→Satisfaction	−.27 (−5.8)	−.20 (−3.9)

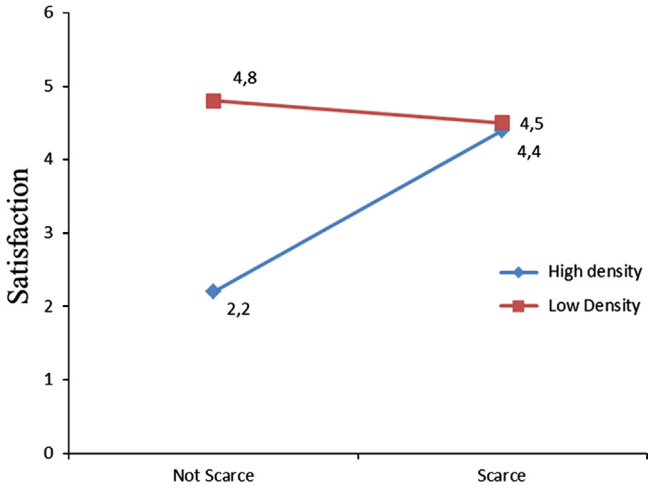

Fig. 2. Density by scarcity interaction on satisfaction.

improvement from the fully constrained model. The parameter estimates are presented in Table 2.

A close examination of the results suggests that the moderating effect of scarcity in the relationship between density and satisfaction is obvious and limited to the density-positive affect and density-negative affect paths (H3a and H3b). In a scarce situation, high density does not reduce consumer positive affective state as much as in a non-scarce situation. Scarcity eases the negative effect of density on consumer enjoyment of the retail situation and turns a somewhat unpleasant experience into a less painful one.

4.2. Analyses of variance: interaction effects

An interaction effect between density and scarcity was also posited in H3c. Thus, interaction effects of the manipulated variables on satisfaction are analyzed. The MANOVA results show significant interaction effects for the scarcity and density variables ($F_{(1,861)}=7.657$, $p=0.006$). These effects are summarized in Fig. 2 hereafter.

Results show that for high levels of scarcity, the extremely dense situation is significantly different from the non-scarce one. Indeed, the dense situation becomes more acceptable, even surpassing the mid-point threshold on the satisfaction scale (3.5) in the scarce situation. On the other hand, the low-density situation is not significantly different in terms of satisfaction in the scarce situation compared to the non-scarce one. Scarcity modifies the usual relationship between density and satisfaction, in which high density always hinders the shopping experience in a utilitarian shopping situation, thus leading to dissatisfaction. In our example, scarcity reverses this trend and turns a negatively loaded crowded situation into something more acceptable. Therefore, H3c is supported.

In order to evaluate the role played by the human or the spatial aspect of the shopping situation, the effect of scarcity on human and spatial crowding is then evaluated. The results are presented in Fig. 3. Aside from the main effect of density suggesting that consumers perceive higher spatial crowding in denser situations, no other effect is found for spatial crowding ($F_{(1,861)}=1.02$, $p=0.306$). Scarcity does not change or modify this relationship (Fig. 3). On the contrary, there is a significant interaction effect for human crowding ($F_{(1,861)}=9.657$, $p=0.000$) (Fig. 3). In highly dense situations, consumers perceive significantly lower human crowding in a scarce situation than they do in a non-scarce situation. However, scarcity does not change human crowding perceptions in an environment that is not dense. Therefore, H4 is supported.

5. Discussion and conclusions

The presence of other customers in a service/retail experience has strong impacts on consumers' experience. In many situations, individuals' evaluation of the situation is partly or totally based on the interactions they have with non-providers. Surprisingly, crowd influences have been studied in a relatively limited manner and deserve more careful and detailed attention. These results contribute valuable insights to the shopping orientation and retail crowding literatures. In this paper, the authors demonstrate the importance of considering the scarcity of the service/retail experience and the affective state triggered by the crowded situation when studying the density–satisfaction relationship.

5.1. Theoretical implications

Researchers in marketing have examined the relationship between crowding and consumers' satisfaction (Eroglu et al., 2005, Machleit et al., 2000) and recent studies emphasize the importance of situational variables when examining those aspects. Our study extends this research in two ways. We investigated the mediating role played by affective states in the process leading to either satisfaction or dissatisfactions in crowded utilitarian situations. Also, this article looked into the moderating impact of scarcity on the consumers' outcomes.

Several results concerning these effects are noteworthy and merit discussion here. First, it was expected that consumers would be in a more negative affective state in dense situations. Furthermore, scarcity should have eased this state or reduced the level of negative affective state as it provides a justification, a rationale and even an added value to the experience (Cialdini, 1995; Wann et al., 2004). These results are supported in this paper.

Second, this paper demonstrates the ability of scarcity to turn a potentially dense and negative situation into a dense but less negative experience for the consumer. Based on these results, it is achieved through decreasing the consumer's negative affect in a dense situation. It also appears that the scarcity game does not have to be played when the density is low, as it does not improve the consumer experience.

Finally, the last set of results offers potential explanations of the mechanisms behind the scarcity effect. For instance, in the dense

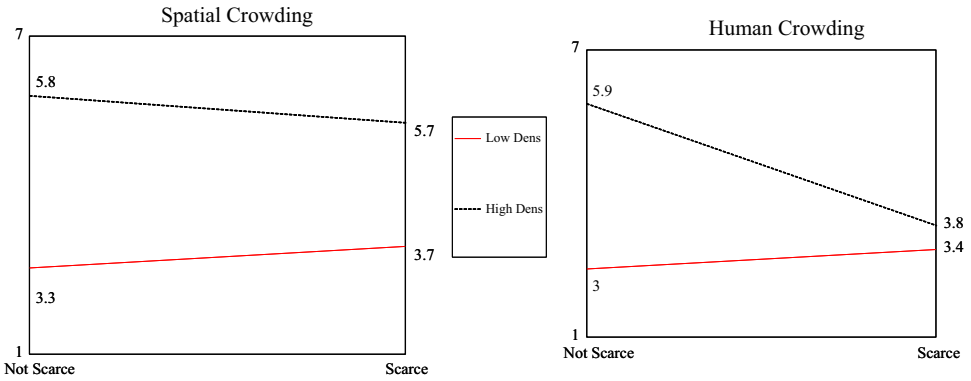

Fig. 3. Density by scarcity interaction on spatial and human crowding.

and scarce situation only the perceived human crowding is reduced. It seems as if consumers do not feel as crowded in the store if they expect to see a crowd of people there. On the other hand, in the same situation, there are no changes in the level of perceived spatial crowding as consumers do not seem to associate scarcity and physical (spatial) characteristics of the store. These results and recent studies (Machleit et al., 2000; Webb and Worchel, 1993) suggest the importance of signals sent by the crowd to potential customers, particularly driving their expectations. Scarcity can be considered as one of these cues or signals and future research along this line is critical.

5.2. Managerial implications

In the past years, several researchers emphasized the importance of crowd management for practitioners (Manning and Valliere, 2001; Pons et al., 2006). For managers, it is important to understand how crowding will affect individuals' satisfaction and try to reduce the negative outcomes for the consumers. The results suggest that creating scarce events can be a solution to reduce dissatisfaction of consumers shopping in crowded situations. Indeed, scarcity can easily be controlled and artificially created by managers in their servicescape as scarcity could become a crowd management tool.

5.3. Limitations and future research

First, we acknowledge several limitations to this research. The simulation method we used to create density and scarcity may limit the generalizability of the findings in actual settings. Future research could be done in real retailing settings to observe consumers' exact reaction to density in scarce events. In addition, different situational factors or individuals aspects may influence the previous results. For instance, individual characteristic (personality traits in particular) may certainly have an impact on consumers' reactions to crowd as suggested in previous research and may need to be tested. However, our experimental design and pretests made sure that some of these variables are controlled in our study (similarity with the crowd, orientation toward other, perceived tolerance to crowding….).

Furthermore, more signals to drive consumers' expectations should be identified and analyzed. Also, the role given to expectations in a crowd situation assessment is limited in previous services marketing studies and it should be developed following studies on satisfaction (Oliver, 1997).

This study signals the moderating role of scarcity on the negative consequences associated with crowding and practitioners can use this aspect in their crowd management. However, this avenue has to be explored very carefully and needs further research. Even if we know that scarcity may enhance customer satisfaction, should service providers encourage scarcity? Customer satisfaction increases with the ability to recover from a breakdown, yet, should service providers be creating artificial breakdowns? (Zeithaml et al., 2006).

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