Stanislav H. Ivanov, Steven F. Illum and Yating Liang

Application of destination brand molecule on destination image and brand perception: An exploratory study

Abstract

The paper presents the destination brand molecule approach to destination image and brand perception measurement, an innovative and non-traditional approach to market research as a tool for potential use by a destination/attraction marketing organization. It investigates the perceptions people have about a destination brand and the way they organize these perceptions in their minds. It employs and further develops the brand molecule concept introduced by Lederer and Hill (2001) and its extension into the tourism destination brand molecule concept by Silver and Hill (2002), with the brand concept mapping approach of John, Loken Kim and Monga (2006). The methodology is tested by creating a destination brand molecule for Las Vegas, Nevada by two convenience samples of respondents (one in Bulgaria and another in the USA). Results show the differences in the way Las Vegas is perceived as a destination by respondents. Limitations of the concept, the potential pitfalls in the application of the destination brand molecule concept as a tool for destination image and brand perception measurement and directions for further research are also elaborated.

Keywords:
destination image; destination branding; brand molecule; concept maps; Las Vegas; USA

Introduction

Attracting tourists to the destination is the primary goal of destination marketing organizations (DMOs). In the currently information-cluttered world facing a global financial crisis, DMOs try to increase the competitiveness of their destinations by different means. One popular option is price cutting, leading to improved price competitiveness of the destination. A second option is by differentiating the destination product from those of competing destinations by creating a powerful destination brand. The latter includes developing an image of the destination and communicating this to target audiences based on positive values and perceptions of the destination (Iversen & Hem, 2008, p. 604). Theoretically, by creating a recognizable and favorable image a destination will attract tourists and achieve/maintain profitability (Echtner & Ritchie, 1991; Phelps, 1986) which also helps it avoid detrimental severe price competition with

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other destinations. As a consequence, destination image and branding have received enormous scientific attention (Gallarza, Gil & Calderon, 2002; Gartner, 1989, 1993; Morgan, Pritchard & Price, 2002; Nadeau, Heslop, O'Reilly & Luk, 2008; Pike, 2002; Telisman-Kosuta, 1989; White, 2004).

Branding is an essential tool used to differentiate products/services, helping them gain sustainable competitive advantage (Aaker, 1996; Grant, 2006; Hill & Lederer, 2001; Keller, 1998). A brand is defined as "identifiable product, service, person or place, augmented in such a way that the buyer or user perceives relevant, unique added values to match their needs most closely" (de Chernatony & McDonald, 2003, p. 25). Branding is the process of creating powerful brands to attract customers. Within this process lies the creating of brand image.

Brand image is a set of beliefs held by consumers about a particular brand (Kotler, Armstrong, Saunders & Wong, 2002, p. 218). Tourism destination brand image generally refers to a compilation of beliefs and impressions based on information processing from various sources over time (Crompton, 1979; Yüksel & Akgül, 2007) and the perceptions about a place as reflected by associations held in a tourist's memory (Cai, 2002). These cognitive perceptions are strongly individual and not easy to generalize – as Phelps (1986, p. 168) puts it: "Perception of place is a highly individual reaction and it is difficult to make satisfactory generalizations". It is normal that some people hold positive while others neutral or even negative attitudes toward a destination. Therefore, marketers are interested not in the individual's perceptions of a destination but *predominant* perceptions actual and potential tourists hold about a destination and the links between these perceptions. By examining tourist and non-tourist perceptions of a destination, marketers can apply image segmentation (Leisen, 2001), develop strong brands that appeal to target market segments and position a destination successfully in the minds of (potential) tourists (Dolničar & Grabler, 2004; Ibrahim & Gill, 2005). In the long term, this may positively contribute to tourists' loyalty toward a destination and result in market competitiveness for repeat and first-time visitors.

Current methodologies for measuring destination image (Gallarza, 2002) have different pitfalls as it will be elaborated further in the text. In this regard, the aim of the current paper is to present a destination "brand molecule" approach not previously introduced in the context of tourism literature. This approach is based on consumers' predominant perceptions of a destination and its organization in tourists' minds. As theoretical background, the approach combines the brand molecule concept introduced by Lederer and Hill (2001) and its extension into the destination brand molecule concept by Silver and Hill (2002), with the brand concept mapping approach of John et al. (2006) elaborated further in the text. The methodology is tested by creating a destination brand molecule for Las Vegas by two convenience samples of respondents, one in Bulgaria and another in the USA.

Literature review

DESTINATION BRANDING

Destination branding is a field of significant research (Blain, Levy & Brent Ritchie, 2005; Cai, 2002; Hunter & Suh, 2007; Kim, McKercher & Lee, 2009; Marzano & Scott, 2009; Morgan, Pritchard & Price, 2002; Konecnik & Gartner, 2007; Pike, 2005; Tasci, Gartner, Blichfeldt, 2003, Tasci, Gartner & Cavusgil, 2007). It is important because the process may help a destination create a more appealing image, differentiate itself from competitors, and avoid price erosion.

A destination brand is more than just a logo design (Blain, Levy & Ritchie, 2005) or a slogan to articulate its positioning strategy (Pike, 2005). A brand possesses a strong emotional charge that attracts customers (Cleverton, 2006) and helps destinations and companies establish long-lasting relationships with them (de Chernatony & McDonald, 2003). Brands, including destination brands, are created in such a way that they are supposed to possess a specific personality (Hosany, Ekinci & Uysal, 2006), with which potential buyers (tourists) identify and find attractive. Their names (e.g. Costa del Sol – Coast of the Sun) often have positive connotations that affect tourists' attitudes which may contribute to their travel motivation and add to satisfaction (Clark, 2009, p. 111).

In order to affect demand, marketers develop destination brands and systematically communicate the links between a destination and specific artifacts (e.g. the Eiffel tower for Paris), activities (e.g. gambling for Las Vegas), people (e.g. the Beatles for Liverpool), otherwise considered as symbolic (Hunter & Suh, 2007) and easily recognizable by potential tourists. Such iconic images evoke memories and positive emotions in target audiences which associate them with a particular destination. Of course, iconic images are not enough as they create too narrow a perception of a destination, possibly risking the falling into an over-positioning trap (Kotler, Armstrong, Saunders & Wong, 2002). Therefore, marketers try to expand an association set for a destination brand (the associations that people hold about a destination). The more association links with different attributes (images, emotions, persons, etc.) a destination brand has, the higher the probability potential tourists will remember and consider it when choosing a destination for a trip. However, it is important to emphasize that such an association set must be coherent, systematic and without internal conflicts in order to create a recognizable and favorable image of a destination. Furthermore, if the destination association set projected by a DMO is too wide and diverse, the image of its destination may become diluted.

Despite all of its merits, branding is not a panacea (Haig, 2003). A destination brand is as powerful as its underlying product. If the tourist resources of a destination are not attractive or its super- and/or infrastructure suffer, then branding may not help it remain competitive in the long run. Furthermore, a destination brand cannot last long without proper management. It needs periodic refreshment through change of its logo, slogan and/or the association set in order for potential tourists to see more and different reasons to (re)visit it.

DESTINATION IMAGE

In practice, destination branding involves creating a distinguishable, memorable and attractive destination image. A brand's image is not a brand but a source of its equity (Cai, 2002, p. 723). Most research on destination image has concentrated to date on tourists' perceptions of a destination (Beerli & Martin, 2004b; Chen, 2001; Correia, Oliveira & Silva, 2009; Edward & George, 2008; Hankinson, 2005; Hsu, Wolf & Kang, 2004; Lee, Lee & Lee, 2005; Litvin & Ling, 2001; Machado, Santos & Sarmento, 2009; Prebensen, 2007; Schneider & Sönmez, 1999; Son & Pearce, 2005), their image formation process (Baloglu & McCleary, 1999; Gartner, 1993; San Martin & Rodriguez del Bosque, 2008), cognitive, affective, and connotative components of image (Gartner, 1993), and factors influencing *perceived* image of a destination (Beerli & Martin, 2004a). This is not surprising considering the fact that tourists represent the demand side of a tourism system, without which tourism will cease to exist both as a social phenomenon and economic activity. Significant research has also focused on the supply side of the equation – travel industry representatives' perceptions of a destination (Baloglu & Mangaloglu, 2001) and a destination's *projected* image (Choi, Lehto & Morrison, 2007; Espelt & Benito, 2005; Xiao & Mair, 2006).

Destination image formation is a complex process. It has been pointed out that destination photography, commonly used by the media in consumer publications and on motion picture screens, in television programming, infomercials, travel magazine articles, brochures, and postcards plays a significant role in destination image formation (Garrod, 2008; Jenkins, 2003; Kim & Richardson, 2003; MacKay & Fesenmaier, 1997; Mercille, 2005; Yüksel & Akgül, 2007). Internet and travel agencies contribute to pre-visit image formation as well (Frias, Rodrigues & Castaneda, 2008). However, some of the influences in the image formation process (e.g. word-of-mouth) are beyond the control of destination marketers. It is not uncommon for a DMO-projected image to differ from that perceived by the non-tourists' image. Usually destination marketers create more exaggerated images in order to increase demand for a destination. The reverse situation is also possible although rare. Potential tourists may perceive a brighter picture of the destination compared to travel industry representatives whose job it is to sell packaged tours (Grosspietsch, 2006).

DESTINATION IMAGE MEASUREMENT

Measuring destination image is a challenging task. Gallarza, Gil and Calderon (2002) provide a classical review of methodologies to analyze the image of a destination. They group them into quantitative and non-quantitative methods. Quantitative methods are further divided into multivariate (principle component; factor and correspondence analysis; multidimensional scaling; cluster, regression and conjoint analysis; and analysis of variance) and bivariate (correlation analysis, t-test) methods. Multivariate methods have an advantage over bivariate, and are usually used as an upper-level method because they allow for determination of the latent multidimensional structure of a destination's image (Gallarza et al. 2002, p. 67). This determines their much wider application compared to bivariate methods (e.g. Baloglu & McCleary, 1999; Beerli &

Martin, 2004a; Chen, 2001; Correia, Oliveira & Silva, 2009; Gartner, 1989; Son & Pearce, 2005).

Non-quantitative methods may include free elicitation, focus groups, in-depth interviews, content analysis (Choi, Lehto & Morrison, 2007; Hankinson, 2004; Prebensen, 2007). Compared to quantitative techniques they provide much richer information. More subtle nuances in a destination's image can be captured, but information aggregation is often subject to a researcher's discretion. They are also very time-consuming to perform and data comparability over time may be difficult to achieve. On the other hand, quantitative methods provide data in a standardized form that can be compared with previous and/or future research, providing the same collection instrument is used to facilitate replication of the research. As each has its own advantage often they are used simultaneously, complementing each other (e.g. Govers, Go & Kumar, 2007; Hunter & Suh, 2007; Luque-Martinez, Del Barrio-Garcia, Ibanez-Zapata & Molina, 2007).

Quantitative methods limit results showing respondents' perceptions of questions initially included in a questionnaire. The use of preformulated questionnaires to assess the image of destination distorts the data because respondents are reminded about specific features/attributes of the destination and are prompted to give answers from a prepared list the particular survey is missing possibilities, these are usually omitted from the subsequent analysis. In fact, respondents may give answers to a predetermined set of attributes to reflect the subjective views of the researcher, not of themselves. Even if content analysis is performed in advance to elicit all possible attributes of a destination, results may reflect the expectations of the researcher, and not the mind of the respondent. An image is about respondents' perceptions. Self-elicitation of destination attributes (asking respondents about their opinion of a destination *without* providing them a list of attributes in advance) seems to be the most appropriate procedure for determining a more accurate image of a destination. The aggregation of attributes identified by individual respondents will reflect their *own* perceptions about a destination.

Destination image is about associations people have about a destination and the links between their perceptions and associations. Multivariate methods can provide misleading results by showing links between perceptions which respondents otherwise may not see as interconnected, i.e., a researcher may find a statistically significant correlation between two variables, but the respondents may not necessarily consider the two variables correlated at all in their minds. Destination image measurement methodologies should capture links between associations that respondents perceive about a destination, not as researchers think respondents see them. Another critical issue must be addressed with regard to data collection techniques commonly applied in destination image surveys. Five- or 7-point Likert scales usually applied in destination image measurement are very good instruments to capture subtleties in people's opinions. However, they are not intuitive but instead, forced scales. People tend to more logi-

cally compare things in 3 levels – e.g. smaller, same size, larger. In this regard, in our research we asked respondents to denote the strength of a link between associations as weak, medium and strong, without other interim levels. Additionally, to overcome some shortcomings of pre-designed destination surveys, this research is designed to allow respondents to have freedom to list *their own* perceptions of a destination's image rather than restricting respondents with a pre-determined list at the elicitation stage.

BRAND MOLECULE, BRAND CONCEPT MAP AND DESTINATION BRAND MOLECULE

Chris Lederer and Sam Hill (2001) developed the concept of the "brand portfolio molecule". The brand portfolio molecule is presented as a set of interconnected atoms, representing individual brands included in a company's portfolio. In a molecule map, individual brands take the form of atoms clustered in ways to reflect *how customers see them* (Lederer & Hill, 2001, p. 126). Each connection between brand atoms in a portfolio molecule might exert positive, neutral or negative impact on a customer's purchase decision. The positive side of the Lederer and Hill (2001) approach is that it articulates customer perceptions about relationships between brands in the company portfolio. It also shows that brands are not perceived by customers in isolation but in their integrity with other strategic or support brands in a company's portfolio.

A destination brand molecule is a natural consequence of the development of the brand molecule concept. It is introduced by Silver and Hill (2002) as a tool to identify potential opportunities for rebranding the USA. Although the idea for a *destination brand molecule* has a strong theoretical and practical impulse it has not received its deserved place in the academic literature of the field of tourism and hospitality. The reasons are two-fold. The first one is subjective: the concept is introduced by an outsider of the tourism research community in a journal one does not expect to find in mainstream tourism literature (*Journal of Business Strategy*). The second reason, however, is based on the objective quality of the research conducted by Silver and Hill (2002). In contrast to typical research papers, the authors of the concept do not provide the methodology for developing the molecule but jump directly from the theoretical level of the concept to graphic depiction of their results. Similarly to Lederer and Hill (2001), Silver and Hill (2002) do not, for example, explain in detail how the associations were derived, how they were ranked, or how the strength of the links between the associations was determined, etc. This puts the onus on other researchers to replicate their study. Our several efforts to contact the authors to clarify these issues failed.

This paper combines the methodology of brand concepts maps and the concept of brand molecule to develop a tourism destination brand molecule. It aims at filling the gap in the methodology to develop a brand molecule for a particular destination. To achieve the goal we imposed the newly developed technique of brand concept mapping (John et al, 2006; Hui, Huang & George, 2008; Martínez & Martínez, 2009). Brand concept maps are used to examine respondents' perceptions toward and their associations with an existing brand. These are based on concept maps predominantly used in physical sciences to elicit knowledge people possess about scientific concepts

and how they are interrelated with each other (Novak & Gowin, 1984, cited in John et al, 2006). They have gained more attention recently as an educational tool (Martin, 2009). Concept maps themselves are a representation of Anderson (1996), people's definition of knowledge structures as "a simple network in which all elements or units are *nodes* and the connections among them are *links*" (p. 25 – italics in the original text).

In practical terms, in the process of brand concept mapping, respondents are asked to list on a blank sheet of paper associations they connect with a brand – a process called "elicitation". Respondents' association lists of are then aggregated by the researcher. The *same* group of respondents produces the most frequently-mentioned associations in the subsequent stage of data collection – the mapping. Respondents are given a copy of the summary list of most frequently-mentioned associations. They are then asked to diagram them on a new sheet of paper as a molecule, denoting the links and the strength of the links between different associations. Resultant individual maps are then aggregated by the researcher to generate a consensus brand concept map generated by the sample of respondents. The final consensus map represents the *predominant* perceptions and associations the surveyed sample has toward a brand (destination). The methodology to create a brand concept map is further elaborated in the next section.

Methodology

To develop a means of measuring respondents' aggregate image of a destination we combined the destination brand molecule concept by Silver and Hill (2002) with the brand concept mapping approach of John et al. (2006) and further improved this methodology to include a valence for each association to respond to the requirements for creating a brand molecule as defined by Lederer and Hill (2001). Two convenience samples were created in order to test the methodology. One included 43 students from the first author's institution in Bulgaria. The second consisted of 50 students from the second and third authors' institution in the Midwest USA. All respondents were of equal age range (20-23 years old) and a nearly equal number of male and female respondents. Convenience instead of representative sampling was used for several reasons. First, convenience sampling provides a high response rate (Bryman & Bell, 2007). Second, the goal of the research was to improve and test a methodology for creating a destination brand molecule, not to explore respondents' perceived image of the destination that would require a representative sample. As it seemed unnecessary to conduct a full scale survey of destination image measurement with a methodology not yet tested, we considered convenience sampling as a most suitable method.

We selected an internationally known tourist destination, Las Vegas, to test the methodology because it was familiar enough to both cohorts of respondents, could potentially generate a long list of associations and thus provide rich data for analysis. However, it could have been any other destination familiar enough to both cohorts (Paris, New York, London, etc.). Selecting a destination familiar only to Bulgarian or US respondents would have provided incomparable results – too rich data for one of the cohorts and perhaps too lean (if any) for the other.

The research methodology included the following five phases: The first phase was *Elicitation* – identification of possible associations to potentially be included in a molecule – conducted through three steps. In Step 1, the respondents made an individual list of associations. Forty-three students from Bulgaria and 50 from the USA were asked anonymously to prepare individual lists of associations with the expression "Las Vegas". Respondents were allowed 10 minutes to complete this procedure. In Step 2, two aggregate lists of associations, one for Bulgarian and one for USA respondents, were prepared. Respondent lists were merged and the frequencies of mentioning of each association calculated. Descriptive statistics for the association lists are presented in Table 1. A total of 199 different associations were produced by the Bulgarian students for a total of 641 with an average of 3.22 times per association. The USA students cited fewer associations with Las Vegas compared to their Bulgarian counterparts. They listed a total of 94 different associations mentioned 349 times, an average of 3.71 times per association. On average, USA students named 7 associations among their lists while Bulgarian students 15. The possible explanations for USA students' lists on Las Vegas are less diverse than their counterparts in Bulgaria could be the following. USA students are more familiar with Las Vegas and some of the respondents may have travelled to Las Vegas before. Most of them have similar perceptions on Las Vegas. On the other hand, Bulgarian students may be more likely to learn about Las Vegas through newspapers, magazines, TV, Internet, and other media outlets, which may present a greater variety of images about Las Vegas.

Table 1
DESCRIPTIVE STATISTICS IN INDIVIDUAL ASSOCIATION LISTS

Statistic	Bulgarian students	USA students
Total number of associations	199	94
Times all associations mentioned	641	349
Average times one association mentioned	3.22	3.71
Total number of association lists	43	50
Average length of one association list	14.91	6.98

Finally, in Step 3, the selection of association lists to be used in the next phase of the research – mapping – was conducted. John et al. (2006, p. 552) suggest that only those associations mentioned in at least 50% of the individual lists generated by respondents should be selected for the next stages of brand concept map construction. However, we considered that employing such a procedure would artificially limit the number of associations in the concept maps. In fact, the procedure would guarantee that only core concepts would be selected in the research. In the John et al. (2006) study the aggregated list of associations also included a few expressions that were not mentioned by the respondents but were of interest to the Mayo Clinic, the subject of the research. This leads, in our opinion, to a distortion of the final list of associations to be used in the next stage of the research. Had we applied this exact John et al. (2006) procedure, we would have limited the number of associations in the final aggregated association lists in our study to only 3 for Bulgarian and only 2 for USA respondents. This would

have enormously reduced the content quantity and analytical quality of the resultant destination brand molecules. Taking this into consideration, we selected for the next phase of the research the associations mentioned by at least 18-20% of respondents (see Table 2). The final lists included 20 associations for Bulgarian respondents and 10 of those from the USA group. The number of associations was neither too low to cause significant loss of information quality, nor too large to challenge the cognitive expressions of respondents. It is interesting to note that 6 of the associations were common in both lists.

Table 2
AGGREGATED ASSOCIATION LISTS

Association	Times mentioned	Percent mentioned
Bulgarian respondents (n=43)		
Casinos	38	88.37%
Hotels	29	67.44%
Money	26	60.47%
Gambling	21	48.84%
Luxury	20	46.51%
Lights	19	44.19%
Girls	15	34.88%
Weddings	15	34.88%
Alcohol	14	32.56%
Desert	14	32.56%
Crimes	13	30.23%
Life	13	30.23%
Expensive	12	27.91%
Rich people	12	27.91%
Luxurious cars	11	25.58%
Celebrities	10	23.26%
Clubs	10	23.26%
Drugs	10	23.26%
Parties	9	20.93%
Prostitutes	9	20.93%
USA respondents (n=50)		
Gambling	33	66.00%
Lights	26	52.00%
Casino	23	46.00%
Drinking	16	32.00%
Shows	15	30.00%
Desert	12	24.00%
Weddings	12	24.00%
Hot	10	20.00%
Hotels	9	18.00%
Strippers	9	18.00%

The Phase 2 was *Mapping*, that is the preparation of individual brand molecules for Las Vegas by the respondents using the association lists from Step 1.3. Respondents

were presented the Aaker (1996) brand map of McDonald's restaurants as an example, and were asked to prepare similar individual maps for Las Vegas. We asked them to apply the following mapping rules:

- use only the associations provided from Step 1.3. Respondents were not required to include all associations from this list in the molecule each of them created.
- use 1, 2 or 3 lines between associations to denote a weak, medium or strong connection between the associations, respectively.
- use +, – or 0 next to each association to denote a positive, negative or neutral influence of a particular association to the overall image of the destination – a so called "valence" of an association.

By following this procedure, 43 Bulgarian respondents generated 41 useful molecules and 50 US respondents created 47 such useful molecules.

The third phase - *Aggregation* – implying coding and aggregations of the individual molecules. We next calculated the statistics shown in Appendix 1, separately for Bulgarian and USA respondents. Appendix 2a and 2b present the results from the aggregation of individual brand molecules for Bulgarian and USA respondents, respectively.

In the fourth phase the *Consensus molecule* was created by combining the individual molecules into consensus molecules, one for Bulgarian, a second for USA respondents. It was conducted in six steps. We started by defining the rules for selection of the fist order associations (Step 4.1) that are considered to be central (core) to the destination brand. An association (*i*-th association) is considered to be of first order if it fulfils all of the following conditions simultaneously:

- in more than 50% of the individual molecules collected, the *i*-th association is mentioned as a first-order association ($R_{1i} > \frac{M}{2}$)
- it has a higher than the average total number of connections with other associations ($C_i > \overline{C}$)
- has an average number of connections with other associations in one molecule higher than the total average number for all associations in all collected molecules ($\overline{C}_i > \overline{\overline{C}}$)

This was followed by the selection of the second order associations (Step 4.2). To be considered as such, an association has to fulfil one of the two sets of conditions. The condition of the Set One is that an association has to fulfill all of the three requirements:
in more than 50% of the individual molecules the i-th association is mentioned as a second-order association ($R_{2i} > \frac{M}{2}$)

- it has a higher than the average total number of connections with other associations ($C_i > \overline{C}$)
- it has an average number of connections with other associations in one molecule higher than the total average number for all associations in all collected molecules ($\overline{C}_i > \overline{\overline{C}}$)

For the Set Two, to be considered as a second order association, the *i*-th association has to be linked with first-order associations selected in Step 4.1, in more than 50% of the individual molecules. Analogically, the third and higher-order associations were derived.

Then, association connections were determined (Step 4.3), where those mentioned by at least 25% of the respondents were selected. In the Step 4.4, the strength of connection between two associations (L_{ij}) was ascertained as:

- weak – when the value is between 1 to 1.5 (i.e. $L_{ij} \in [1;1.5)$)
- medium –- when the value is between 1.5 to 2.5 (i.e. $L_{ij} \in [1.5;2.5)$)
- strong - when the value is between 2.5 to 3 (i.e. $L_{ij} \in [2.5;3]$)

Similarly, in Step 4.5, the valence of an association in the consensus molecule ($\overline{V}_i$) was determined as:

- positive – when the value is between 0.5 to 1 (i.e. $\overline{V}_i \in [0.5;1]$)
- neutral – when the value is between -0.5 to 0.5 (i.e. $\overline{V}_i \in (-0.5;0.5)$)
- negative – when the value is between -1 to -0.5 (i.e. $\overline{V}_i \in [-1;-0.5]$)

In the last step (4.6), molecule is presented graphically by using suitable colors and dash lines to show different associations, their valences and the strength of connections between them. Thus, the final result of Phase 4 is the formulation of a consensus destination brand molecule representing the predominant views of the respondents. This inevitably reduces the information loaded in the individual molecules due to aggregation. Therefore, some of the associations and connections mentioned in the individual molecules do not appear in the final version. It must be reminded that destination marketers are interested in the *predominant* perceptions across visitors about the destination brand created, not the perceptions of a single visitor.

In the last, fifth phase a *validity analysis* was conducted to determine whether the aggregations performed are methodologically correct. Following John et al. (2006) we randomly half-split the individual molecules created by the respondents (separately for Bulgarian and USA respondents), derived new consensus molecules ("validation consensus molecules") and compared the associations included in them with the associations in the original consensus molecules.

Discussion of results

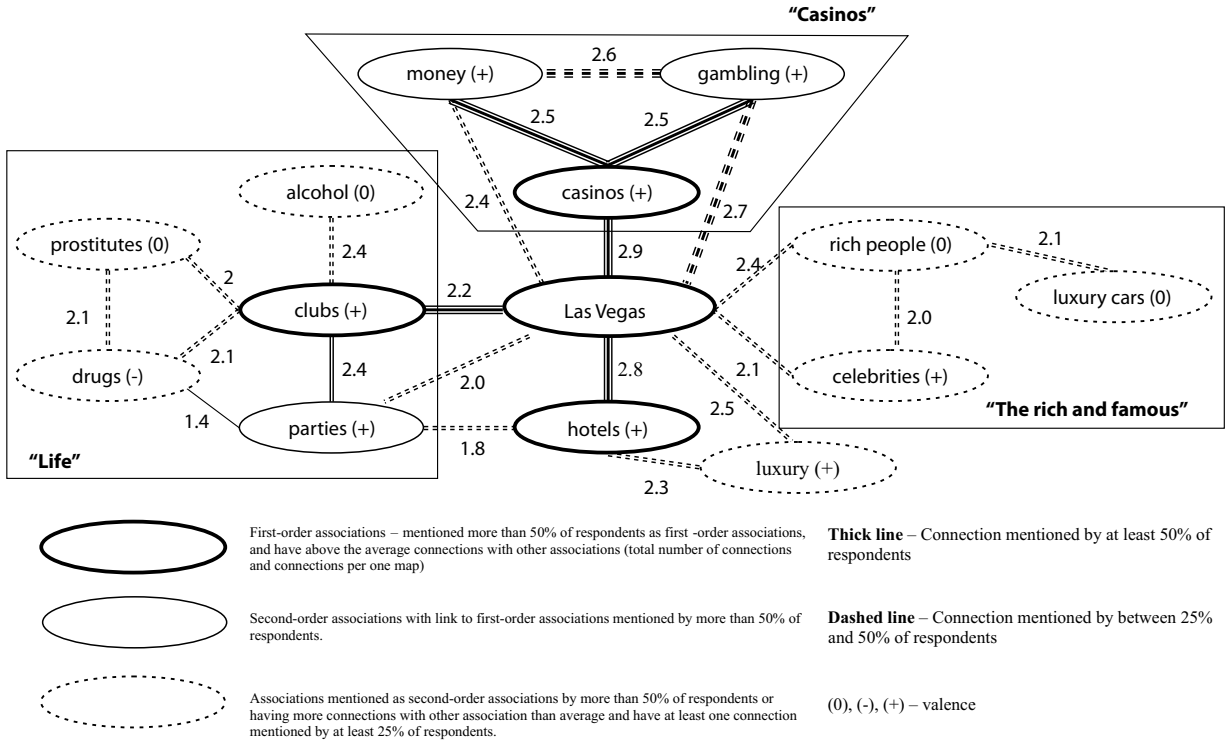
Using two samples from different nationalities gives the opportunity to identify the differences in the perceptions of the two samples of respondents and the potential pitfalls in the application of the destination brand molecule concept in different cultural settings. The section below elaborates the results generated with the two samples.

LAS VEGAS DESTINATION BRAND MOLECULE – BULGARIAN RESPONDENTS

The destination brand molecule for Las Vegas created from the Bulgarian responses (Figure 1a) demonstrate only 3 associations with strong direct connections with the

main brand of Las Vegas – casinos (L=2.93 from a theoretical maximum of 3.00), hotels (L=2.83) and clubs (L=2.22). All of these associations have positive valences as well, i.e. they strengthen the positive image of the destination among Bulgarian respondents. Results also clearly show the formation of 3 clusters (or "genes", if we use the biological term in addition to the "molecule"). The "Casino" cluster (gene) unites the positive associations that respondents expressed with casinos, money and gambling. The associations in this cluster have strong links between each other (min L=2.55 for the link "casinos – money") and with the main brand of Las Vegas (min L=2.43 for the link "money – Las Vegas").

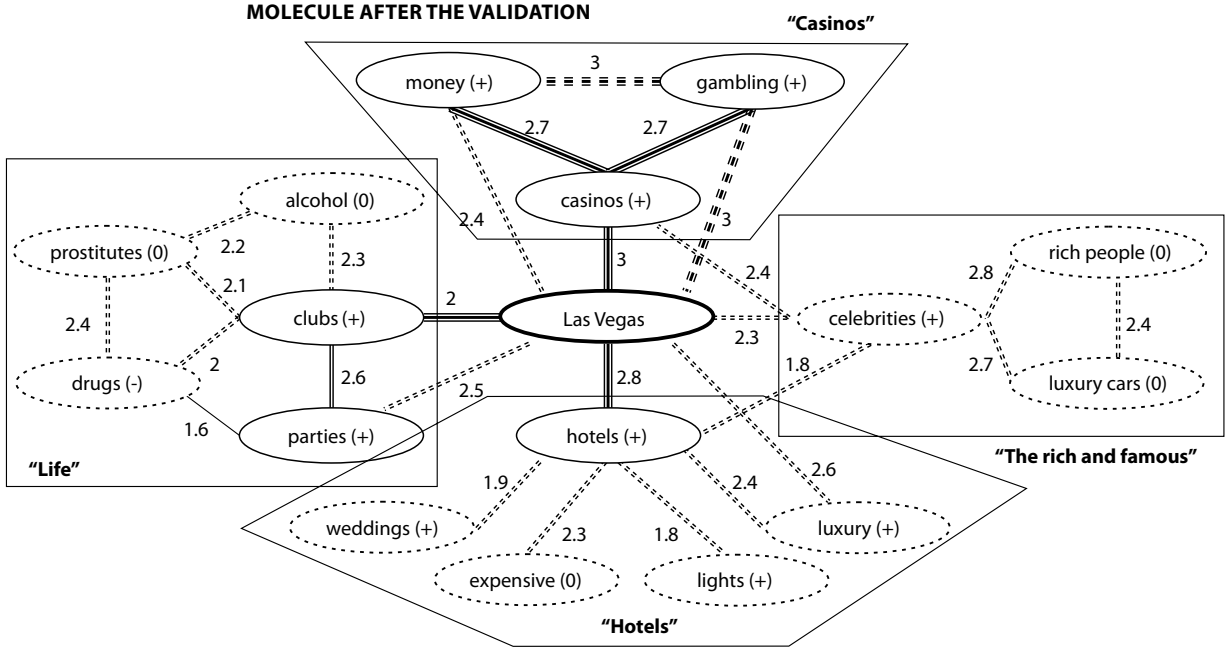
Figure 1a
DESTINATION BRAND MOLECULE OF LAS VEGAS – BULGARIAN RESPONDENTS – ORIGINAL MOLECULE AFTER THE AGGREGATION



The "Life" cluster (gene) consists of associations related to partying. This is the most controversial gene in the molecule as it includes associations with all signs of valence – positive (clubs, parties), neutral (alcohol, prostitutes) and negative (drugs) by applying the criteria from Step 4.5, i.e., some of the associations add to the positive image of Las Vegas while others may harm it. The "Rich and famous" cluster (gene) connects associations related to rich people, celebrities and luxurious cars. It does not contribute significantly to the positive image of Las Vegas as two of the associations have neutral valence and the links between them and Las Vegas are medium in strength. Finally, the "Hotels" stand as a relatively lonely association having no very strong links with others. It is linked with "luxury" and "parties" but the links were mentioned by less than one-half of the respondents.

To validate each aggregation, we randomly selected one-half of the individual molecules prepared by the respondents to create a new validation consensus brand molecule (Figure 1b). We found that all associations from the original brand molecule were replicated in the new validation molecule, with the same valence. The validation molecule included 3 additional associations not found in the original one ("weddings", "expensive" and "lights"). This was due to the smaller number of individual molecules included in the validation sample, which resulted in greater weight of each individual molecule in the validation molecule than in the original. Thus there may be a greater chance that an association will be included in a consensus molecule during validation rather than in the original aggregation.

Figure 1b.
DESTINATION BRAND MOLECULE OF LAS VEGAS – BULGARIAN RESPONDENTS – CONSENSUS MOLECULE AFTER THE VALIDATION



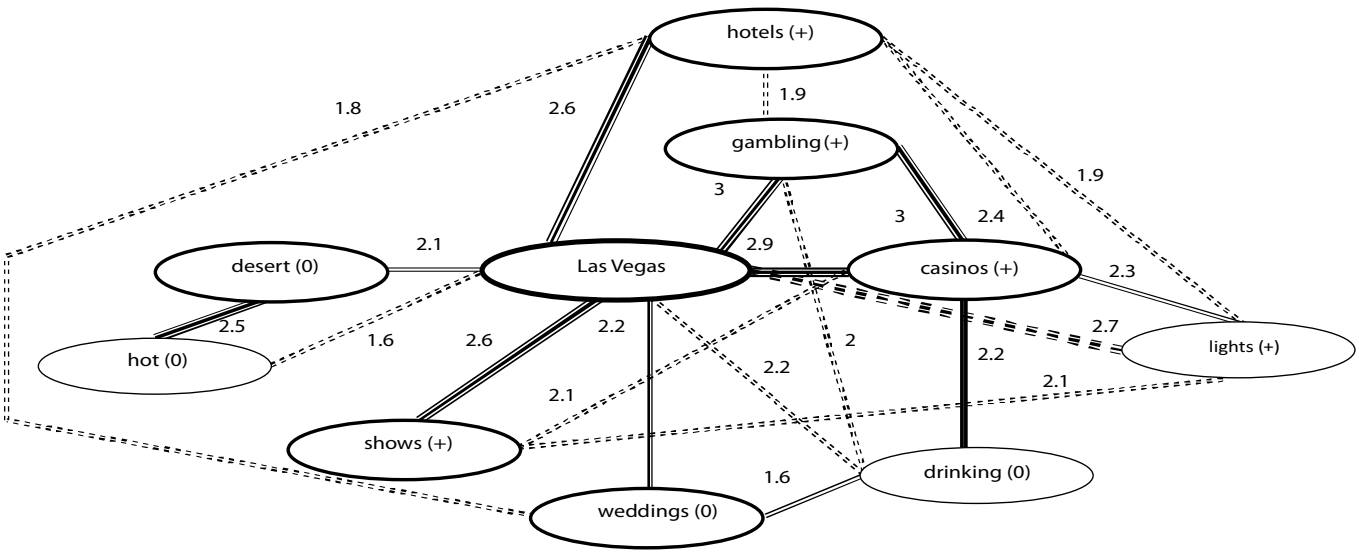
We further validated the strength of the links between associations in the original and in the validation molecules by calculating the correlations between the strength of the links in each. We coded the presence of a link between any two associations in the original molecule with its respective strength, while an absence with 0. We found that for the Bulgarian respondents the Pearson correlation between the strength of the association links in the half-split validation molecule and the original consensus molecule is 0.884 ($p \leq 0.01$, N=91) denoting that the original aggregation was performed correctly.

LAS VEGAS DESTINATION BRAND MOLECULE – USA RESPONDENTS

The consensus molecule generated from the individual molecules of the USA respondents (Figure 2a) included only 9 associations, 6 of which have a direct link with the main brand Las Vegas and are therefore considered to be first-order associations

– "gambling", "hotels", "desert", "shows", "weddings", "casinos". The only 3 associations not linked directly with Las Vegas are "hot" (linked only with "desert"), "drinking" (linked with "weddings" and "casinos") and "lights" (linked with "casinos" and "weddings"). There seems to be a complex connection system among the associations with several links mentioned by at least 50% of the respondents - "gambling-casinos" (L=2.95), "casinos-lights" (L=2.28), "casinos-drinking" (L=2.23), "drinking-weddings" (L=1.64), and "desert-hot" L=2.54). Additionally, between 25% and 50% of respondents identified the following links: "hotels-gambling" (L=1.91), "hotels-casinos" (L=2.44), "gambling-drinking" (L=1.96), "drinking-Las Vegas" (L=2.22), "shows-casinos" (L=2.13), "shows-lights" (L=2.12), "hotels- weddings" (L=1.77) and "hotels-lights" (L=1.92). It is interesting to note that all valences in the consensus molecule are either positive or neutral, with no association contributing to the deterioration of the destination's image.

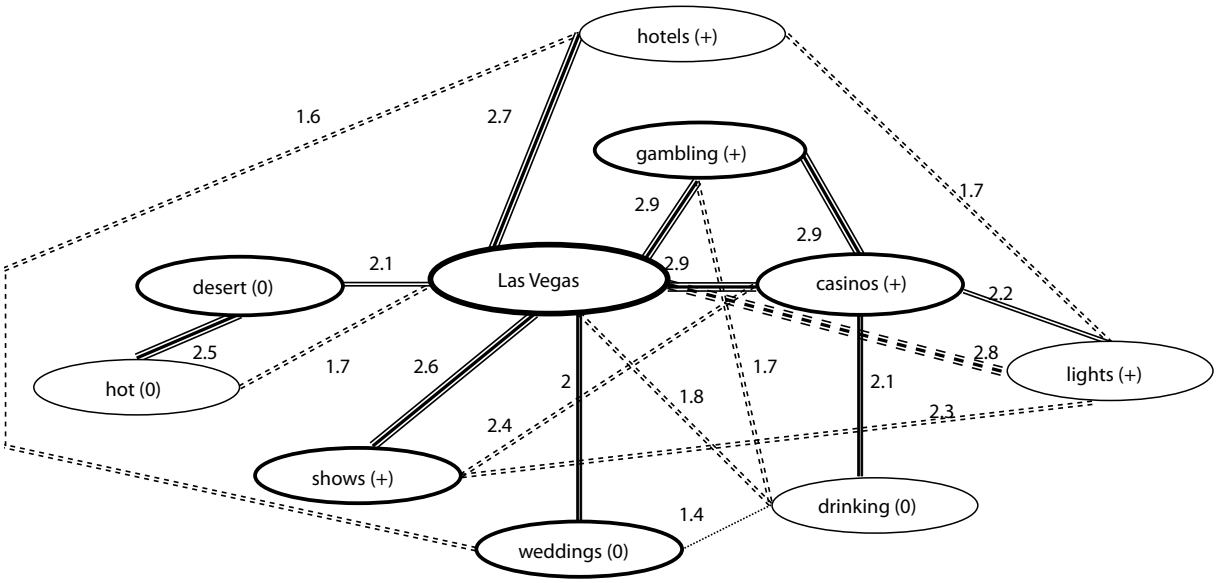
Figure 2a.
DESTINATION BRAND MOLECULE OF LAS VEGAS - USA RESPONDENS - ORIGINAL MOLECULE AFTER AGGREGATION



For the validation, we applied the same methodology as for the molecules from the Bulgarian respondents – randomly half-split the maps and reaggregated the selected individual molecules. The validation consensus molecule generated from the individual molecules of USA respondents is presented in Figure 2b. All associations from the original consensus molecule appear in the validation one. Differences between both molecules are minute – two links from the original molecule do not appear in the validation one ("hotels-casinos" and "hotels-gambling"), while one link that was mentioned by more than 50% of the respondents in the original molecule was mentioned by between 25-50% in the validation molecule ("drinking-wedding"). All association valences were the same in both original and validation molecules. The correlation coefficient between the strengths of the association links in the original and validation consensus molecules is 0.902 ($p \leq 0.01$, N=32), confirming the validity of the aggregation procedure.

In deference to the consensus molecule of the Bulgarian respondents, the USA consensus brand molecules included predominantly first-order core associations. Six out of nine associations in it are of first-order (only 3 in the Bulgarian molecule), while 3 are second-order associations (12 in the Bulgarian molecule).

Figure 2b.
DESTINATION BRAND MOLECULE OF LAS VEGAS - USA RESPONDENS - CONSENSUS MOLECULE AFTER VALIDATION



This result is not surprising and represents the much more clear associations of the USA respondents reflecting images of the USA-based destination compared to their Bulgarian counterparts. Six associations appear in both consensus molecules – "casinos", "gambling", "lights", "weddings", "hotels", "alcohol/drinking". These associations can be considered as core associations as they do not depend on the nationality of the respondents. However, the relative strength of their links with the brand – Las Vegas – is different in the two consensus molecules. Only "casinos" and "hotels" are recognized as having a direct and strong link with Las Vegas in both samples, while the other 4 common associations must be considered secondary associations in the Bulgarian consensus molecule. It must be pointed out that all associations included in the Bulgarian consensus molecule can be found in the original full associations list of the USA respondents (i.e. the associations list discussed above in Step 1.2. of the methodology). The opposite is also true – all associations from the USA consensus molecule can be found in the associations list of the Bulgarian respondents.

Conclusion

It is important to remember that a destination image is a relativistic construct (Gallarza et al., 2002: 71). Every person has his/her own image of a destination. The consensus brand molecules derived from our research reflect the predominant perceptions of respondents toward the destination under study, not the perceptions of any particular group member. An inherent difficulty in the methodology is the fact that the respon-

dents who proposed the associations during the elicitation stage and prepared their individual molecules during the mapping stage must be the same group. Otherwise a mapping will not reflect the associations for a given sample. Considering the fact that there may be a time gap between the elicitation and mapping stages (several days or weeks) needed to aggregate the individual association lists and select the major associations to be used for the mapping stage, there is always a risk that the sample in the elicitation stage will be different from the sample in the mapping stage if one cannot control a sample group's movement. Tourists and potential tourists have limited time and the probability that they would like to participate in *both* stages of the research is not very high unless turnaround can occur very quickly.

A possible solution is to perform the elicitation stage in face-to-face interviews, while the mapping can be performed via post survey. In this case the aggregation during the elicitation stage should include only the associations created by a given respondent group willing to take part in the second stage of the research. Of course, this type of research would require more time, human and financial resources, but the information and conclusions about perceived image of the destination derived from it would be of great value for marketers. They would be able to identify key associations and links between them, and develop a destination communication mix and promotional materials to better appeal to a target market.

As noted in the literature review, photographs significantly influence the perceived image of a destination. Therefore, marketers would be able to portray images of associations in brochures that they want to link to the destination or avoid images and messages hinting about associations they want to disassociate with their destination. They might also design a logo for their destination and the wording of its slogan in such a way to support positive associations of target audiences with the destination and oust negative ones.

The process of forming destination brand molecules is not a panacea for struggling destinations that have serious problems. If a destination doesn't have proper tourist infrastructure, service quality suffers, or the destination is not accessible, creating a destination brand molecule for marketing purposes cannot save it from decline. A molecule might only be used as a fine tuning tool in the arsenal of DMOs. Furthermore, small and unfamiliar destinations often cannot generate enough associations among potential tourists. Creating a brand molecule for them may not be viable. The methodology seems to work best for popular city break, sport or leisure destinations (e.g. capital or large cities, seasonal resorts), as well as for large attractions like theme or national parks, because all stages of the methodology could be effectively carried out and many diverse associations would be generated by respondents.

This paper is only an exploratory study on the practice of how a destination brand molecule may be applied to assessing a destination's image and perceptions. Future research should apply the destination brand molecule process to a group of actual visi-

tors to a destination. Furthermore, research can be focused on investigating differences between the associations visitors and non-visitors hold about a destination. Such research may help destination marketers to identify the role of visitation in the perceived image on the destination.

Appendix 1

CODING AND AGGREGATION STATISTICS

Statistic	Symbol and calculation
• Total number of individual destination brand molecules	M
• Total number of associations mentioned in individual molecules	N
• Times *i* -th association mentioned in individual molecules	N_i
• Times the connection between *i*- th and *j* -th associations	N_{ij}
• Strength of connection between the *i*- th and *j* -th associations in a particular molecule	L_{ij}
• Average strength of connection between the *i*- th and *j* -th associations in all molecules	$\overline{L}_{ij} = \frac{\sum L_{ij}}{N_{ij}}$
• Valence of *i* -th association	V_i
• Average valence of *i* -th association in all molecules	$\overline{V}_i = \frac{\sum_i V_i}{N_i}$
• Number of connections of *i* -th association with other associations	$C_i = \sum_j N_{ij}$
• Average number of connections of *i* -th association with other associations per one molecule	$\overline{C}_i = \frac{C_i}{N_i}$
• Average total number of connections of one association in all molecules	$\overline{C} = \frac{\sum_i C_i}{N}$
• Total average number of connections of one association per one molecule	$\overline{\overline{C}} = \frac{\sum_i C_i}{\sum_i N_i}$
• Number of first-order connections of an association – times the association mentioned in all molecules with a direct connection with Las Vegas	R_{1i}
• Number of second-order connections of an association – times the association has connections with a first-rank association in all molecules	R_{2i}
• Number of third- and higher-order connections of an association – times the association has connections with a second- or higher-order association in all molecules	R_{3i}

Appendix 2a

AGGREGATED STATISTICS FROM THE INDIVIDUAL BRAND MOLECULES FOR LAS VEGAS – BULGARIA

Associations	Times included in the molecules	Number of +	Number of 0	Number of -	Valence	Number of first order links	Number of second order links	Number of third and higher order links	Associations																				Total number of connections	Average number of connections per one molecule
									Las Vegas	Casinos	Hotels	Money	Gambling	Luxury	Lights	Girls	Weddings	Alcohol	Desert	Crimes	Life	Expensive	Rich people	Luxury cars	Celebrities	Clubs	Drugs	Parties	Prostitutes		
Las Vegas	-	-	-	-	-	-	-	-	-	29	29	14	17	17	10	5	15	3	16	10	9	5	10	6	12	23	6	11	4	-	-
Casinos	39	28	1	3	1	29	9	1	29	-	12	20	23	6	7	5	1	2	1	4	4	3	8	2	6	1	2	3	3	142	3.64
Hotels	38	29	3	1	1	29	7	2	29	12	-	6	3	17	7	3	9	1	1	1	3	8	5	6	6	2	1	10	5	135	3.55
Money	34	23	3	0	1	14	20	0	14	20	6	-	11	4	2	1	2	0	1	5	5	3	4	2	2	3	1	3	2	91	2.68
Gambling	36	18	8	3	1	17	19	0	17	23	3	11	-	2	1	1	1	2	2	3	2	2	3	2	3	1	2	1	1	83	2.31
Luxury	36	29	2	0	1	17	17	2	17	6	17	4	2	-	4	1	2	0	1	1	2	7	9	8	6	2	1	2	1	93	2.58
Lights	29	19	5	0	1	10	16	3	10	7	7	2	1	4	-	2	2	0	1	1	2	2	3	1	2	7	1	2	1	58	2.00
Girls	25	11	6	3	0	5	14	6	5	5	3	1	1	1	2	-	2	1	1	1	3	1	4	2	3	9	2	7	6	60	2.40
Weddings	29	17	5	5	0	15	11	3	15	1	9	2	1	2	2	2	-	4	1	1	5	3	2	2	3	1	3	2	1	62	2.14
Alcohol	32	10	7	7	0	3	24	5	3	2	1	0	2	0	0	1	4	-	0	2	5	0	0	0	0	15	6	9	2	52	1.63
Desert	18	2	2	10	-1	15	3	0	16	1	1	1	2	1	1	1	1	0	-	1	2	1	1	1	1	1	2	1	1	37	2.06
Crimes	28	0	1	21	-1	10	10	8	10	4	1	5	3	1	1	1	1	2	1	-	4	1	4	2	2	4	9	2	8	66	2.36
Life	20	11	4	1	1	9	10	1	9	4	3	5	2	2	2	3	5	5	2	4	-	3	2	2	2	3	4	4	4	70	3.50
Expensive	22	4	4	11	0	5	16	1	5	3	8	3	2	7	2	1	3	0	1	1	3	-	4	1	1	1	1	1	1	49	2.23
Rich people	33	13	10	3	0	10	20	3	10	8	5	4	3	9	3	4	2	0	1	4	2	4	-	14	13	5	3	4	6	104	3.15
Luxurious cars	33	21	5	2	1	6	21	6	6	2	6	2	2	8	1	2	2	0	1	2	2	1	14	-	11	2	1	1	2	68	2.06
Celebrities	31	18	6	1	1	12	16	3	12	6	6	2	3	6	2	3	3	0	1	2	2	1	13	11	-	5	6	4	3	91	2.94
Clubs	37	27	2	1	1	23	8	6	23	1	2	3	1	2	7	9	1	15	1	4	3	1	5	2	5	-	15	25	13	138	3.73
Drugs	36	4	2	25	-1	6	22	8	6	2	1	1	2	1	1	2	3	6	2	9	4	1	3	1	6	15	-	10	11	87	2.42
Parties	38	29	3	0	1	11	23	4	11	3	10	3	1	2	2	7	2	9	1	2	4	1	4	1	4	25	10	-	8	110	2.89
Prostitutes	36	13	4	14	0	4	22	10	4	3	5	2	1	1	1	6	1	2	1	8	4	1	6	2	3	13	11	8	-	83	2.31

Average total number of connections of one association in all molecules - $\overline{C}$ 83.95

Total average number of connections of one association per one molecule - $\overline{\overline{C}}$ 2.67

Appendix 2b

AGGREGATED STATISTICS FROM THE INDIVIDUAL BRAND MOLECULES FOR LAS VEGAS – USA

Associations	Times included in the maps	Number of +	Number of 0	Number of -	Number of 1st order links	Number of 2nd order links	Number of 3rd order links	Associations											Total number of connections	Average number of connections per one map
								Las Vegas	Gambling	Lights	Casino	Drinking	Shows	Desert	Weddings/Marriage	Hot	Hotels	Strippers		
Las Vegas	-	-	-	-	-	-	-	-	26	19	36	22	28	39	25	17	31	16	259	
Gambling	45	29	7	9	26	19	0	26	-	3	42	23	2	0	3	0	12	1	112	2.49
Lights	45	35	8	2	20	23	2	19	3	-	26	1	19	2	2	0	12	6	90	2.00
Casino	46	35	5	6	36	10	0	36	42	26	-	32	16	1	1	0	21	4	179	3.89
Drinking	47	22	9	16	22	22	3	22	23	1	32	-	6	1	24	2	8	16	135	2.87
Shows	45	42	2	1	29	14	2	28	2	19	16	6	-	0	1	1	7	18	98	2.18
Desert	45	15	18	12	39	4	2	39	0	2	1	1	0	-	0	41	2	0	87	1.93
Weddings	47	19	18	10	26	11	10	25	3	2	1	24	1	1	-	0	13	4	73	1.55
Hot	46	8	19	19	18	26	2	17	0	0	0	2	1	41	0	-	0	0	61	1.33
Hotels	45	39	6	0	30	13	2	31	12	12	21	8	7	2	13	0	-	13	119	2.64
Strippers	46	8	10	28	14	20	12	16	1	6	4	16	18	0	4	0	13	-	78	1.70
Average total number of connections of one association in all molecules - $\overline{C}$																			93.82	
Total average number of connections of one association per one molecule - $\overline{\overline{C}}$																			2.258	

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