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MULTICITY TRIP PATTERNS
Tourists to the United States

Yeong-Hyeon Hwang
Dong-A University, Korea
Ulrike Gretzel
Texas A&M University, USA
Daniel R. Fesenmaier
Temple University, USA

Abstract: This study examines international tourists' multicity trip patterns within the United States. Actual and perceived distance from the country of origin to the destination is assumed to affect the likelihood of multicity tourism behavior. In addition, higher opportunity costs for first-time tourists are expected to lead to increased multicity patterns. An analysis of the trips of international tourists to US metropolitan areas confirmed that multicity patterns differ for groups of tourists with different origins and varying levels of familiarity with the destination. Differences lie in the directionality of flows as well as the extent and nature of multicity tourism behavior. **Keywords:** multidestination travel, city tourism, destination bundling network analysis international tourism. © 2006 Elsevier Ltd. All rights reserved.

Résumé: Itinéraires comprenant plusieurs villes: touristes aux Etats-Unis. Cet article étudie le comportement des touristes internationaux qui visitent plusieurs villes aux Etats-Unis. La distance réelle ou perçue entre pays d'origine et destination influerait sur la probabilité du comportement de visiter plusieurs villes. En plus, les coûts d'opportunité plus élevés pour les touristes qui font leur premier voyage mèneraient à l'intensification du comportement de voyager à plusieurs villes. Une analyse des voyages des touristes internationaux aux métropoles américaines confirme que les itinéraires à plusieurs villes diffèrent pour les groupes de touristes selon leurs origines et leurs différents niveaux de familiarité avec la destination. On trouve des différences de directionalité et de l'étendue et la nature du comportement de voyager à plusieurs villes. **Mots-clés:** voyages à destinations multiples, tourisme urbain, groupement de destinations, analyse de réseau, tourisme international. © 2006 Elsevier Ltd. All rights reserved.

INTRODUCTION

The city as a geographical entity plays a vital role in tourism. For example, over 50% (26.6 out of 50.9 million) of the visits of international tourists to the United States during the year 2000 were to the top 10 US city destinations (Travel Industry Association of America

Yeong-Hyeon Hwang is Senior Lecturer (School of International Tourism, Dong-A University Busan, Korea, 604-714. Email <dryeong@daunet.donga.ac.kr>). **Ulrike Gretzel** is Assistant Professor, Department of Recreation, Park & Tourism Sciences. **Daniel Fesenmaier** is Professor and Director, National Laboratory for Tourism & eCommerce. Their combined tourism research interests include decisionmaking, spatial behavior, influences of technology on behavior, and intelligent system design.

2001). In spite of its significant contribution to national and global patterns, city tourism has not yet been comprehensively analyzed. Existing research on this topic focuses mostly on management aspects related to urban destinations (see Mazanec 1997 for a detailed discussion of information needs and the application of analytical tools in the context of city tourism management). However, the integration of behavioral approaches in city tourism research has been largely ignored. Consequently, aspects of tourist behavior in and around urban settings have not been fully recognized and explored (Pearce 1987; Shaw and Williams 1994).

This lack of research regarding the behavioral foundations of city tourism has been attributed to the ''heterogeneity'' of cities and to their ''multifunctionality'', with the latter referring to the diverse functions of urban facilities and their support of tourists and residents alike (Shaw and Williams 1994). In fact, the city not only serves as a destination but also acts as an important link among destinations within a trip by providing critical infrastructure such as transportation facilities and information services. Thus, it represents a crucial point of embarkation/debarkation to/from all kinds of destinations, including seashore resorts and national parks located in the hinterland. In addition, cities support travel to other metropolitan areas and thus encourage multicity tourism, which is the focus of this paper.

The role of cities in multidestination trip networks is of increasing interest to destination managers and marketers. The development and use of information technologies in general, and of the Internet in particular, have led to the emergence of new levels of interactivity and customization in city marketing (Werthner and Klein 1999). With these comes a reconsideration of packaging strategies for tourism products due to decreases in transaction and coordination costs and increases in sales-effectiveness through mass customization. In addition, packaging strategies or looser forms of product bundling such as dynamically assembled itineraries and lists of recommendations are supported through new organizational approaches that allow for ''coopetition'' rather than traditional forms of *either* competition *or* cooperation (Brandenburger and Nalebuff 1996). However, many city organizations are struggling with the idea of finding valid partner cities with which bundling could be promoted in certain markets. Thus, a more thorough understanding of multicity patterns is needed to enable city tourism organizations to fully capture the benefits of cooperative marketing through bundling/packaging strategies.

This paper aims at filling some of the prevailing gaps in research related to multicity tourism by examining differences in the structure (that is, what cities, how many of them, what combinations of them) and directionality (which ones are visited before visiting other cities) of multicity patterns among tourists with different origins and levels of familiarity with the destination. As such, it provides insights regarding the roles of different locations in driving tourist flows and the importance of varying bundling/packaging strategies for different markets.

MULTIDESTINATION BEHAVIOR

The concept of visiting several destinations during a trip has attracted the interest of researchers in diverse areas such as transportation, geography, marketing, and tourism (Dellaert, Arentze, Bierlaire, Borgers and Timmermans 1998; Tideswell and Faulkner 1999; Wallace, Barnes and Rutherford 2000). However, a substantial amount of the research on destination choice and trip itineraries is based on the assumption that a prospective tourist visits only one destination. It has been argued that even though single destination choice models have contributed substantially to the understanding of tourists' actions, it is far too simplistic a concept to be able to explain realistic multidestination behavior (Jeng and Fesenmaier 1998; Leiper 1990; Lue, Crompton and Fesenmaier 1993; Murphy and Keller 1990; Tideswell and Faulkner 1999). Past research on this topic has revealed that it is both an intuitively appealing and empirically proven phenomenon (Fesenmaier and Lieber 1988; Hanson 1980; O'Kelly 1982; Stewart and Vogt 1997). Following a conceptual framework proposed by Lue et al (1993), empirical research has focused on the examination/documentation of various patterns (Oppermann 1995; Stewart and Vogt 1997) and on the exploration of the interdependency among destinations (Jeng and Fesenmaier 1998). A number of studies (Jeng and Fesenmaier 1998; Kim and Fesenmaier 1990; Tideswell and Faulkner 1999; Wallace, Barnes and Rutherford 2000) have shown that such decisions are influenced by the characteristics of the tourist and by the spatial configuration of the destinations. One promising explanation can be derived from Kim and Fesenmaier (1990). Their study indicates that the spatial configuration of the tourist's origin with respect to potential destination(s) influences the pattern of agglomeration of places to be visited within a trip; that is, available resources at the origin as well as the characteristics of the destination affect the trip pattern.

The Effects of Accessibility

Among the many concepts concerned with describing and/or explaining the spatial relationships between origin and destination, the notion of accessibility is perhaps the most important. It can be defined as the ease of traveling from an origin to a destination (Pirie 1979). Its importance in multidestination decisions is closely related to the idea of economic rationalism and explains tourists' choices as a strategy for minimizing cost. Greater accessibility to one location is less likely to lead to multidestination tourism because opportunity costs associated with postponing visits to additional ones are smaller than in the case of poor accessibility. One of the obvious factors that influence accessibility is the distance between an origin and a destination and the higher costs (financial and time) that are usually associated with greater geographical distances. Greater costs decrease perceptions of accessibility and also represent fixed costs that can be better leveraged

by visiting multiple destinations. In addition, the distance decay effect, which describes people's tendency to visit more places within the destination as they travel farther, is known to exist, especially for pleasure trips (Oppermann 1995). However, accessibility is not only defined by physical distance. There are many other factors that can influence perceived accessibility such as language barriers, health risks, or risks of crime and terrorism at the destination. On the other hand, well-developed transportation links, cultural similarity, and lower prices can increase the perceived accessibility of a place (Jeng and Fesenmaier 1998).

Accessibility further incorporates a person's evaluation of his/her chances to visit the destination in the future (Pirie 1979). That is, tourists who frequently go to a specific location are expected to perceive it as more accessible than those who visit less often, even if the actual distance is the same. Further, frequent trips lead to familiarity with a certain destination. The more familiar the tourist is with the location, the more knowledge one has of different kinds of local activities and attractions to fill an entire trip schedule. Familiarity increases the possibility of ''off the beaten track'' behavior and more time-consuming activities at the main destination, thus leading to a smaller need for spreading one's risk by traveling to several locations. Therefore, tourists who: live close to a destination; perceive it as being close; have the opportunity to travel relatively often to a related place; and are very familiar with a place, are expected to engage less in multidestination tourism, because they perceive the risk of visiting the related place as relatively low and can anticipate future visits to the area.

Based upon this discussion, it is posited that multicity tourism is a function of the tourist's country of residence, which subsumes various aspects of accessibility like actual distance, transportation links, and perceptions of accessibility; and familiarity, which, in the context of this study, is defined as whether a destination has been visited in the past. These two factors are typically collected in surveys and are readily available for analysis and potential comparison. The following hypotheses were formulated to test the relationship between these two proxies of accessibility and the extent to which city destinations are combined in a single trip:

H_{1a}: *Differences in multicity patterns exist among tourists with different origins.*
H_{1b}: *First-time tourists are more likely to visit several destinations than repeaters.*

Multidestination Trip Patterns as Network Structures

Many different measures for describing the degree of concentration of travel among destinations have been proposed in the literature (Papatheodorou 2003; Smith 1989; Uysal, Fesenmaier and O'Leary 1994). However, it is argued that such trips can be best understood in terms of networks of relationships among destinations. The representation of locations as nodes and travel between cities as links among these nodes allows for an investigation of structural properties of multicity trips. In contrast to conventional statistical methods, network

analysis does not require observations to be independent, which makes it particularly suitable for an investigation of the subject. Further, the strength of network-theoretical concentration measures lies in their ability to overcome the constraints of pairwise comparison, to take the specific characteristics of the relationships among the nodes into account (direct versus indirect links), and to produce measures at the node as well as the network level. There are three sets of network-related concepts of specific importance for the analysis of multicity trips that need to be understood.

Centrality/Centralization. Node centrality is used to measure the prominence of certain nodes in a network (Wasserman and Faust 1994). Network centralization, in contrast, is a measure used to describe the structural characteristics of the network as a whole. It is determined by calculating the difference between the centrality scores of the most central node and those of all other nodes in the network. It is usually expressed as a ratio of the actual sum of the differences to the maximal possible sum of them (Monge and Contractor 2003). There are several ways of defining what it means for a node (city) to be central in a network, and three of these centrality concepts have been identified as particularly relevant in the context of multicity trip networks: degree centrality, betweenness centrality, and closeness centrality. Degree centrality refers to the number of links a node has to other nodes in the network. Thus, it is a measure that gauges the extent to which one city is directly connected to all others (Monge and Contractor 2003). An example of a city with a relatively high degree centrality can be found in Figure 1. City 4 has five direct links to other nodes in the network within a system where the maximum number of possible links is 13 $(n - 1)$, indicating that the city has a considerable number of direct links to all other cities in the network. If the network consisted of only Cities 1–6, City 4 would be directly linked to all others in the network and would have the highest possible degree centrality score. If only a small number of nodes in the network has high centrality scores, the network centralization is high. On the other hand, the network centralization is zero if all nodes have an equal number of direct ties to all others in the network, as would be the case if the network displayed in Figure 1 consisted only of Cities 8–11. Thus, a city with a high degree centrality is extensively ''bundled'' with other ones and a high degree centralization of the entire network indicates that a small number of nodes accounts for a large number of the connections made within the network.

Betweenness centrality measures the extent to which a city is directly connected only to those that are not directly connected to each other (Wasserman and Faust 1994); for example, City 7 has a high betweenness centrality (Figure 1). Those nodes with high betweenness scores can be conceptualized as hubs that serve as important connections and that control flows between other cities. At the network level, betweenness centralization is a measure of the heterogeneity of the betweenness scores of the individual nodes. In city networks with high centralization, all travel occurs through a small number of hubs. One

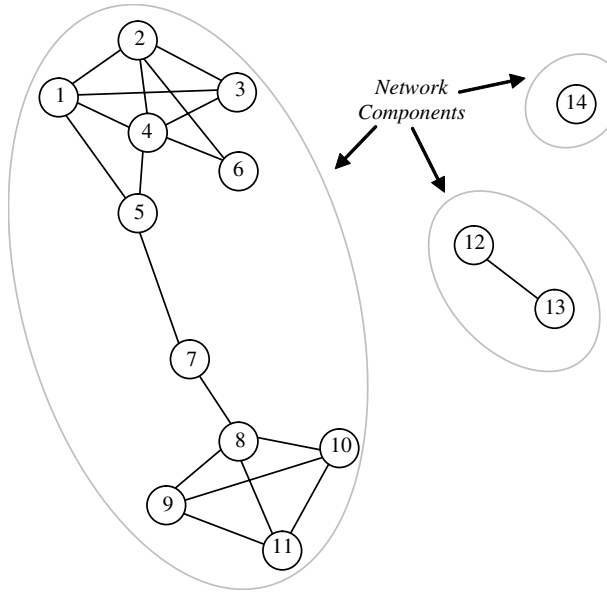

Figure 1. Network Theoretical Concepts

of the major concerns for city tourism marketing is whether such hubs are defined perceptually (as centers of culture or other attractions) or serve solely as transportation hubs. There is of course a dynamic relationship between degree and betweenness centrality with highly connected locations being more likely to serve as links between other cities (Fleming and Hayuth 1994). On the other hand, a strategic position as a hub could encourage links with other cities and thus lead to higher degree centrality.

Closeness centrality focuses on how close a city is to all the other cities in the network. It is based on geodesic distances, which refer to the shortest path between two nodes. For example, the shortest path between Cities 1 and 11 in Figure 1 equals 4. Thus, in contrast to degree centrality, closeness takes both direct and indirect ties into account. Closeness centrality is simply the inverse of the sum of the geodesic distances from city *i* to all other cities (Monge and Contractor 2003). Similar to the other centralization measures, closeness centralization is a measure of the variability in the closeness centrality scores of all cities in the network. From a transportation perspective, a city with a high closeness centrality score can be understood as one from which many other cities can be easily reached. For bundling purposes, high closeness centrality scores are interesting in that they indicate which cities co-occur in a trip network, regardless of whether the connections of the particular city with others are direct or exist through links with other cities.

The following hypotheses were derived based on the network theoretical concepts dealing with centralization in trip network structures:

H_{2a}: *Tourist origin influences the degree to which certain cities are central as well as the overall centralization of the trip network.*

H_{2b}: *The betweenness centrality of cities in the network corresponds to the centrality of these destinations in the airline transportation network.*

Connectedness and Cohesion. Network analysis can also help address questions related to the underlying structure of the respective network (Scott 1991). Isolates, for instance, are cities that have no connections to other cities in the network (City 14 in Figure 1). A network can also consist of various subsets. The term component refers to the largest connected subset of cities and their respective ties for which no links to nodes outside of it exist (Monge and Contractor 2003). The network depicted in Figure 1 has three components. Network structures can also be characterized by whether or not they contain so-called ''cohesive subgroups''. Wasserman and Faust (1994) define cohesive subgroups as subsets of nodes among which there are relatively strong, direct, intense, frequent, or positive ties.

Cliques are special cases of cohesive subgroups. A clique is a maximal complete subgroup of three or more nodes, that is, combinations of three or more cities that are very strongly connected. Following Wasserman and Faust (1994), this strict definition of a clique is an appropriate measure for densely connected networks such as the ones included in this study. For pleasure trips, network components are very likely to be found in trip networks with distinct regions, and cohesive subgroups are likely to occur where destinations are perceived to be similar (Jeng and Fesenmaier 1998). Although it is not impossible to convince tourists that currently unconnected destinations could be visited together, one can assume that packaging strategies for destinations which are already frequently combined require much less marketing effort and will be more readily accepted. Thus, it is argued that different cliques will emerge for different markets and alternative packaging strategies can be developed to accommodate these differences. The following hypothesis summarizes the assumptions made regarding tourist origin and cliques in the trip network:

H_{2c}: *Tourist origin influences the number and nature of cliques in the network.*

Structural Equivalence. Network analysis can be used to examine associations between two network structures. Two networks are structurally equivalent if they have identical ties to and from all nodes (Wasserman and Faust 1994). However, for large ones that are based on the trips of all tourists from a certain region, structural equivalence in this strict sense is very unlikely to be realized, especially if the absence or presence of links and the strength of the links among destinations are considered. Thus, the notion used for the purpose of this study is one of approximate structural equivalence. In other words, networks are tested in terms of whether they have the same pattern of links (Burt 1980). The two most prominent measures of structural equivalence are Euclidean distance and correlation. One of the most interesting

associations within the context of multidestination trips is the relationship between distance and actual trip patterns, as a high similarity between the two networks indicates that geographical space strongly influences multidestination behavior. Thus, the following hypothesis was formulated:

H_{2d}: *Bundling patterns among cities are structurally equivalent to their spatial relationships.*

Directionality of Multicity Patterns

Travel between destinations is directional in nature; that is, the conditional probability of visiting B given that a visit to A has occurred, $p(B|A)$ is likely to be different from $p(A|B)$ due to the spatial relationship between trip origin and destination (Kim and Fesenmaier 1990). For a specific City A, if the difference between the conditional probabilities of visiting it given visits to City B and the conditional probability of the opposite direction is significantly larger than 0, with $p(A|B) - p(B|A) > 0$, it is posited that A is likely to be an endpoint destination, while B is likely to be a transit point (Figure 2). Since international tourists typically enter the United States at different points depending on their continent of origin, significant differences in the directionality of flows can be assumed. Further, different perceptions of accessibility among tourists with different origin lead to variations in the number and variety of cities visited together; thus, this influences the role the specific cities play in a multicity network. The following hypothesis was formulated based on these assumptions:

H_3: *A city's role as a transit vs. an endpoint destination differs for tourists with different origin.*

Study Methods

The analyses presented in this paper are based primarily on the US In-Flight Survey data; additional secondary data was obtained from the US Department of Transportation (1997) regarding the structure of the US air transportation network. A detailed description of the survey can be found on the Office of Travel & Tourism Industries Website (Hwang, Wang, Beaman, Fesenmaier and O'Leary 2002; Office of Travel and Tourism Industries 2003). This is a survey of international tourists to and from the US and has been ongoing since 1982. Interna-

If p(A|B) > p(B|A), then A is an endpoint destination.
If p(A|B) < p(B|A), then A is a transit destination.

Figure 2. Directionality of Travel between Cities

tional trip data are collected by sampling outbound flights from the US and then sampling non-US residents on those flights. Responses are weighted to represent the number of passengers with the same nationality leaving the same US airport based on I-94 data provided by the US Immigration and Naturalization Service. The questionnaire used in the in-flight survey is quite comprehensive, including a variety of questions regarding international tourists' current trip to the United States. This study focuses attention on four questions included in the survey. One, the Metropolitan Statistical Areas (MSAs) visited during a trip (respondents are asked to list up to seven destinations visited; information on the mode of transportation used to reach the destinations is not collected); two, the length of stay at each MSA; three, the extent to which the respondents have visited the country previously; and, four, country of residence.

In order to ensure a sufficient sample for as many city combinations by origin as possible, 1996 and 1997 in-flight survey data were combined, and only the trip records generated from the largest three continents (Europe, Asia, and Latin America) in terms of trip volume were included in the final data set. A variable that designated the continent in which each respondent resides was created and incorporated into the data set. This approach was considered appropriate, as international tourist markets are typically segmented by continent. In addition, the data included only pleasure trips with the main destination located in the United States (with Hawaii and Alaska excluded). Trips longer than three months were not included as they are likely taken for other reasons than pleasure, such as education. Further, since the focus of this study is on city tourism, the 50 Metropolitan Statistical Areas with a population of over one million (based on US Census data for 1990) were selected, and only trips that involved travel to at least one of these MSAs were included in the analyses. As a result of these decisions, a total of 10,313 international pleasure trip records were retained. Multicity trips were defined as those that included travel to more than one and up to seven MSAs, as this is the maximum number of destinations accommodated by the survey.

The role of a specific city in the air transportation network was measured based on the total number of enplanements for all airports in the respective MSA. Enplanement figures were derived from the US Department of Transportation report on airport enplanement activity for 1996 (US Department of Transportation 1997). Taking into account just one year rather than both 1996 and 1997 was considered sufficient, as no significant changes in the air transportation network could be identified for this time period; also, the focus of analysis was on the relative position of the cities with respect to air traffic and not on absolute numbers. A series of analyses using descriptive and multivariate methods was conducted to test the respective hypotheses. Specifically, network analyses were conducted using UCINET 5.0 (Borgatti, Everett and Freeman 1999), which is a social network analysis program that allows for computation of centrality measures, subgroup identification, role analysis, elementary graph theory, and permutation-based statistical analysis. In addition, the program has

strong matrix analysis routines such as matrix algebra and multivariate statistics. All other analyses, including multidimensional scaling tasks, were conducted using SYSTAT 10 and SPSS (SPSS 2000; SPSS 2002).

Study Results

The following provides an overview of the most important findings regarding multicity trip patterns within the US by international tourists during 1996–97.

Characteristics of Multicity Trips. Of the approximately 6 million international pleasure trips taken into account for this study, 31.3% were multicity, and the average number of MSAs visited on a trip overall was 1.5. A relatively large portion of Asian tourists to the US (40.7%) visited more than one metropolitan area, leading to an overall average of 1.6 cities visited. Only 32.1% of the trips taken by European tourists involved multicity trips, with an average of 1.5 cities visited. The number is even lower for Latin American tourists (22% multicity with on average 1.3 cities included). These differences are significant ($p < 0.05$); consequently, H_{1a} was supported. Considerable differences between tourists from the respective continents were also found in terms of the length of stay. Asian tourists, the group with the highest proportion of multicity trips, spent a significantly lower number of nights in the country (on average 7.7 nights as compared to 12.9 by European and 11.4 by Latin American tourists). Thus, it appears that multicity tourism is more a function of perceptions of accessibility rather than simply duration of a trip.

The importance of multicity trips was also examined for groups with different levels of tourism experience in the United States. Overall, approximately 32% of first-time tourists and 31% of repeaters visited more than one city. Even though the difference is minimal and not significant ($p > 0.05$) for the total number of international tourists, noticeable differences appear to exist among tourists from the different continents. In the case of Asians, approximately 43% of first-time tourists visited at least two major cities while a significantly smaller portion of repeaters (38%) took a multicity trip ($p < 0.05$). A similar decreasing pattern, but with a minimal change and insignificant difference, can be observed in the case of Latin American tourists (24% of first-timers versus 23% of repeaters). The opposite trend was found for European tourists: 29.9% of first-time tourists visited more than one city and 33.6% repeaters took multicity vacations ($p < 0.05$). H_{1b} was thus only partly supported.

Multicity Trip Patterns. The most visited US cities differ for each origin group. Orlando, Florida, was the most popular destination for Latin American and European tourists; it was included in 40% of the trips generated by Latin American tourists and 26% of trips taken by Europeans. In contrast, only about 7% of the trips made by Asians included Orlando. New York and Los Angeles ranked second and third for Euro-

pean and Latin American trips. The most popular city for Asian tourists was Los Angeles (36%), followed by Las Vegas (17%) and San Francisco (15%). In contrast to a fairly large portion of trips by European and Latin American tourists to Miami and Tampa, these cities were not ranked within the top 10 city destinations for Asian tourists. Instead, a significant percentage of trips by Asians included Seattle and Phoenix. Notably, the cumulative frequency for visiting the top 10 MSAs ranges from 85 to 94% of the number of total trips generated by tourists from the three origins. This finding indicates that travel to US MSAs is highly centralized.

The ratio of multicity to the total number of trips also varies by both destination and continent of origin. For example, about one third of the trips made to Orlando were multicity, and this figure is consistent for residents of all three continents. Trips to Los Angeles, however, show noticeable differences with respect to origin. About 86% included travel to other cities in the case of Europeans. In contrast, this figure drops to 63% for Latin Americans and 57% for Asians. Las Vegas appears to be an important component of multicity tourism for European and Asian tourists (87% and 82%, respectively), while it plays a more significant role as a single destination for Latin Americans (50%). The extent to which multicity travel occurs varies from one city to another and ranges from 27% (Orlando) to 93% (San Diego). This indicates that Orlando is largely considered a primary destination of single city trips; San Diego, on the other hand, is almost always part of a multicity trip.

An origin-destination frequency matrix was developed in order to examine differences in multicity patterns among tourists from the three continents. To simplify the representation of the results, the direction of travel between cities was not taken into account. As a result, a total of 1,200 $((50 * 50/2) - 50)$ frequency pairs were included in each origin-destination matrix. Table 1 presents which cities most frequently co-occur in the trip networks of tourists from the three continents. Los Angeles–Las Vegas (14.3%), Los Angeles–San Francisco (8.9%), Las Vegas–San Francisco (8.4%), and Los Angeles–San Diego (5.4%) pairs appear to be dominant for cities on the West coast. On the east coast, Orlando–Tampa (10%), New York–Orlando (3.4%), Boston–New York (3.2%), and Miami–Orlando (2.6%) often co-occur in multicity trips. Figure 3 provides a graphical representation of frequently co-occurring cities overall and for the three continents of origin. It is important to note that Asian tourists appear to visit and combine a smaller number of cities than Europeans and Latin Americans, indicating that the multicity trip patterns of Asian tourists are highly centralized.

Analysis of the structure of pleasure trips among US cities using network analysis methods confirms the higher centralization of the Asian network (57.5%) compared to 47.4% for the European network and 37.7% in the case of Latin American tourists; thus, H_{2a} was confirmed. Also, 134 cliques were identified for the European network, whereas only 63 were found in the Asian and 41 in the Latin American network. This finding confirms H_{2c} and suggests that Europeans tend to include

Table 1. Frequently Combined Cities by Origin

Rank	Europe		Asia	
	City Pairs	%	City Pairs	%
1	Tampa–Orlando	12.6	Los Angeles–Las Vegas	33.0
2	Los Angeles–Las Vegas	9.5	San Francisco–Los Angeles	14.8
3	San Francisco–Las Vegas	7.5	San Francisco–Las Vegas	14.6
5	San Francisco–Los Angeles	7.3	San Diego–Los Angeles	5.2
6	San Diego–Los Angeles	5.0	Orlando–New York	1.9
7	New York–Boston	3.7	New York–Las Vegas	1.7
8	Orlando–Miami	2.6	New York–Los Angeles	1.5
9	San Diego–Las Vegas	2.6	New York–Boston	1.4
10	Raleigh–Greensboro	2.2	Orlando–Los Angeles	1.2
11	Orlando–New York	2.0	New York–Minneapolis	1.1
12	Phoenix–Las Vegas	1.8		
13	San Francisco–Sacramento	1.7		
14	Orlando–Los Angeles	1.7		
15	Philadelphia–New York	1.7		
16	Phoenix–Los Angeles	1.6		
17	New York–Los Angeles	1.4		
18	West Palm Beach–Orlando	1.3		
19	San Francisco–New York	1.3		
20	San Francisco–San Diego	1.2		
	Sum	68.8		76.4

Rank	Latin America		Overall	
	City Pairs	%	City Pairs	%
1	Tampa–Orlando	16.6	Los Angeles–Las Vegas	14.3
2	Orlando–New York	11.2	Tampa–Orlando	10.0
3	Orlando–Miami	6.9	San Francisco–Los Angeles	8.9
5	Los Angeles–Las Vegas	5.6	San Francisco–Las Vegas	8.4
6	San Francisco–Los Angeles	5.3	San Diego–Los Angeles	5.1
7	San Diego–Los Angeles	4.4	Orlando–New York	3.4
8	New York–Boston	4.1	New York–Boston	3.2
9	Philadelphia–New York	3.8	Orlando–Miami	2.6
10	West Palm Beach–Orlando	2.9	San Diego–Las Vegas	2.0
11	San Francisco–Las Vegas	2.8	Philadelphia–New York	1.7
12	San Francisco–Sacramento	1.6	San Francisco–Sacramento	1.5
13	New York–Las Vegas	1.6	Orlando–Los Angeles	1.4
14	Orlando–Atlanta	1.5	New York–Los Angeles	1.4
15	Sacramento–Los Angeles	1.4	Phoenix–Las Vegas	1.3
16	Philadelphia–Orlando	1.3	Raleigh–Greensboro	1.3
17	New Orleans–Los Angeles	1.3	West Palm Beach–Orlando	1.2
18	Miami–Los Angeles	1.2	New York–Las Vegas	1.1
19	San Francisco–New York	1.2	San Francisco–New York	1.1
20	San Diego–Las Vegas	1.1		
	Sum	75.7		70.0

a greater variety of cities in their multicity trips. Asians, on the other hand, appear to concentrate on a small number of cities, which they

combine heavily. The results for Latin American tourists confirm that they travel to a limited number of places and are less likely to combine these with other destinations, thus leading to a low centralization score and a low number of cliques. However, no significant differences among the respective networks were found regarding the most popular destinations. Although the extent to which the different groups travel to different cities varies, cities that were most central in the Asian network (New York, San Francisco, Los Angeles, Orlando, and Las Vegas) were also highly central in the networks for tourists from Europe and Latin America.

A comparison of closeness centrality measures was not possible as a number of isolates appeared in the Latin American network. Closeness is a distance measure and, thus, cannot be calculated if a network is not connected. However, several interesting results were found by calculating centrality and centralization scores based on betweenness. Consistent with the previous results, the Asian network was more centralized in terms of betweenness, with New York being the most important link between West and East coast destinations. For the European network, New York, San Francisco, and Chicago were the most important hubs, whereas Latin Americans connect mostly in New York and Orlando.

Since international city tourists rely heavily on air transportation, additional analyses were conducted to examine the extent to which these trip patterns were driven by existing airline network structures. All cities included in the analysis were ranked based on their overall betweenness centrality scores. A separate ranking was calculated based on airport enplanement figures for each of the 50 MSAs. The rankings of the two indices were then correlated; the results indicate that there

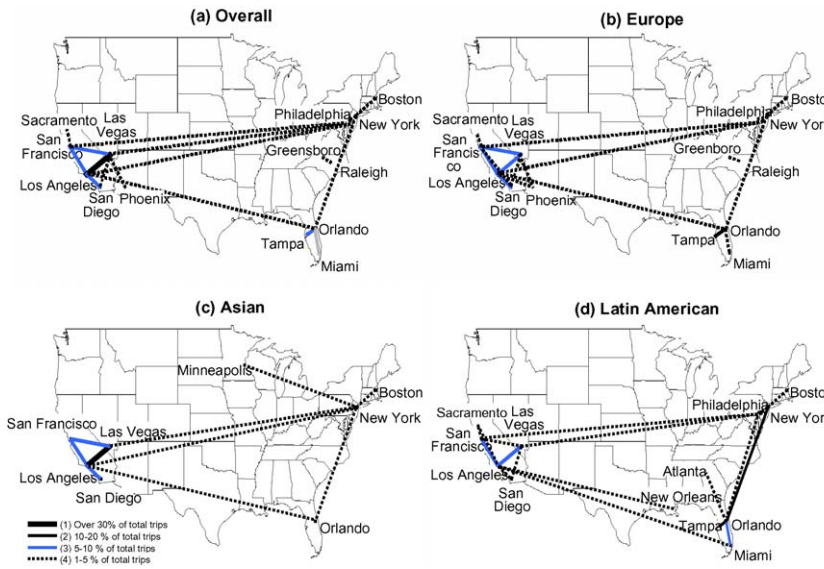

Figure 3. Co-occurrence of Cities by Origin

is a significant, although only moderately strong, relationship between the ranking of a city according to its importance as an airline hub and its betweenness centrality score ranking (Pearson correlation coefficient = 0.657; $p = 0.01$). City size (based on 2000 population figures) was also identified as having a potential to influence the betweenness centrality of a city; as expected, the rank order correlation shows that city size and betweenness centrality are correlated (Pearson correlation coefficient = 0.566; $p = 0.01$). A correlation analysis was then conducted between airline hub and size ranks, and the results confirm that the two concepts are highly correlated (Pearson correlation coefficient = 0.861; $p = 0.01$). Last, a multiple regression analysis was conducted between airline hub and size ranks (as independent variables) and betweenness centrality rank (the dependent variable); the results of this analysis indicate that only airline hub rank was significant in explaining the variance in betweenness centrality rank (Beta Coefficient = 0.656; $p = 0.01$; Adjusted R Square = 0.41). Thus, it appears that city size directly influences the likelihood of a city serving as an important airline hub which, in turn, increases the likelihood that a city will provide links to other city destinations within the United States. Therefore, H_{2b} was supported.

A comparison of the trip networks with an actual distance matrix (with distances between cities measured in kilometers) was conducted using the quadratic assignment procedure analysis as discussed by Wasserman and Faust (1994). Interestingly, the results indicate that there was no significant correlation between bundling patterns and geographical distances between US cities, except in the case of the Latin American network (Pearson correlation coefficient = 0.10; $p = 0.02$). Figure 4a is a graphical representation of the distance matrix and illustrates the spatial relationships among the respective cities. In contrast, Figure 4b displays the relationships among them based on the overall multicity patterns arising from international tourism in the United States. Both maps were derived using the same multidimensional scaling procedure where the stress measures confirmed the adequacy of two dimensions (SPSS 2000). A visual comparison of the networks confirms the findings of the quadratic assignment procedure analysis indicating that they were not structurally equivalent; that is, cities that are geographically close are not necessarily combined in trip networks. Overall, H_{2d} was not supported, suggesting that the actual distance between two US cities is relatively unimportant for determining which ones are combined by international tourists.

Directionality of City Travel. The directionality of travel between US cities was examined by pairwise comparisons of $p(A|City_i)$ and $p(City_i|A)$ for those that were among the top 10 most frequently visited destinations. The results are shown in Table 2 and strongly support the hypothesis that differences in directionality exist within and between the respective origins. Within origin measures indicate significant differences for the three origin groups in terms of the role of the respective cities as endpoint versus transit destinations. Negative values in Table 2 indicate that a city is more likely to be an endpoint for the specific origin group whereas positive values indicate that a city is more

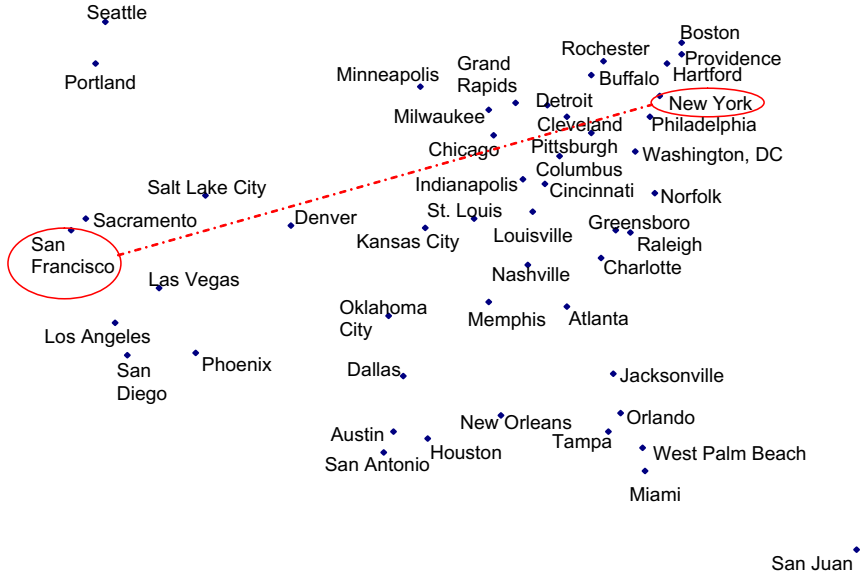

Figure 4a. Spatial Relationships among Cities

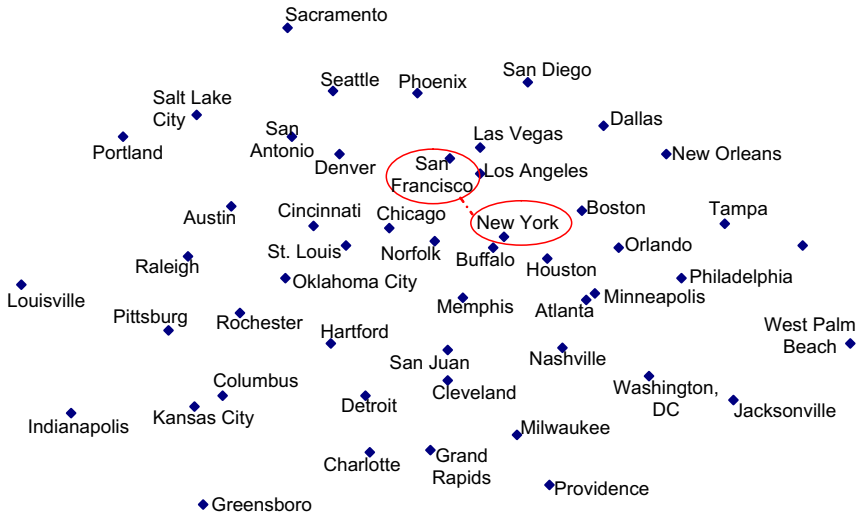

Figure 4b. Relationships among Cities based on Co-occurrence in Multicity Trips

likely to be a transit destination. On the other hand, between origin measures test whether the findings vary significantly for the different origin groups. Some cities such as Orlando, New York, and Los Angeles were more likely to be endpoints in the trip networks. Others such as San Diego and Miami did not show differences in directionality.

Table 2. Directionality of Travel between Cities

Cities	Within Origins			Between Origins					
(A)	*Europe*	*Asia*	*Latin*	p(Other cities|A)			p(A|Other cities)		
	E1-E2	A1-A2	L1-L2	E1-A1	A1-L1	E1-L1	E2-A2	A2-L2	E2-L2
Orlando	-1.98^{b}	-4.19^{a}	-1.82^{b}	0.19	−0.07	0.12	−2.02	2.30	0.28
New York	-3.77^{a}	-9.62^{c}	-4.29^{a}	−0.02	0.05	0.04	-5.87^{b}	5.39^{a}	−0.48
Los Angeles	-1.26^{b}	-8.90^{c}	-0.49^{a}	0.22^{a}	−0.01	0.21	-7.42^{b}	8.39^{c}	0.97^{a}
San Francisco	-2.71^{b}	-5.78^{c}	−0.48	0.09	0.11	0.20	-2.98^{a}	5.41^{c}	2.43^{b}
Las Vegas	-1.73^{b}	−0.66	−0.54	−0.29	0.44	0.15	0.78	0.56	1.33^{a}
Tampa	-1.68^{a}	0.48	−0.15	0.00	−0.14	−0.14	2.17^{b}	−0.78	1.39
San Diego	0.53	0.22	1.04	0.24	−0.36	−0.12	−0.07	0.46	0.39^{b}
Miami	0.12	1.62	−0.11	−1.14	1.30	0.17	0.36^{a}	−0.42	−0.06
Boston	-1.67^{a}	0.09	−2.42	0.10	−0.16	−0.06	1.85^{b}	−2.66	−0.81
Chicago	−1.44	-1.51^{a}	−0.79	0.29^{a}	−0.03	0.26	0.22	0.70	0.91
Phoenix	0.80	−1.35	0.28	0.25	0.48^{b}	0.73	−1.91	2.11	0.20^{a}
Houston	0.08	4.20^{a}	−0.26	-4.46^{a}	4.56^{a}	0.10	−0.34	0.09	−0.25
Seattle	0.64	4.23^{a}	−0.26	-3.93^{a}	4.58^{a}	0.65	−0.34	0.09	−0.25

Note: E1: p_{European}(Other cities|A); E2: p_{European}(A|Other cities); A1: p_{Asian}(Other cities|A); A2: p_{Asian}(A|Other cities); L1: $p_{\text{Latin American}}$ (Other cities|A); L2: $p_{\text{Latin American}}$ (A|Other cities). $^{a}p < .1$; $^{b}p < .05$; $^{c}p < .01$.

Houston and Seattle were more likely to be transit destinations, however only for Asian tourists. In contrast, they were significantly more likely to end their trip in New York, Los Angeles, or San Francisco. The likelihood of visiting other cities after Las Vegas was significantly smaller (1.7%) for European tourists than the likelihood of going the opposite direction, while no differences existed for Asian and Latin American tourists.

The relatively small variation for cities favored by European tourists indicates that no dominant entry or transit points exist for this group of international tourists. Overall, few differences appeared in outbound trips generated from each city, while substantial variations were observed in inbound trips from other destinations to each top 10 city. Asian tourists who had traveled to one of the major cities other than the ones included in the top 10 list were more likely to visit New York, Los Angeles, and San Francisco as a next destination than were Europeans and Latin Americans. On the other hand, European tourists who had traveled to cities other than the top 10 were more likely to subsequently visit Tampa, Miami, and Boston than Asians were. Further, Europeans had a higher likelihood of visiting Los Angeles, San Francisco, San Diego, and Phoenix as a subsequent destination than Latin Americans. These results confirm H_3.

Overall, all relationships were supported by the data except for H_{1b} (familiarity decreases the extent of multicity tourism), which was not supported for European tourists, and H_{2d} (the structure of multicity patterns corresponds to the spatial relationships among the cities),

which was only marginally supported for the Latin American network. Thus, the findings indicate that the extent of multicity visits differs by tourist origin, greater familiarity only decreases this for certain markets, and tourist origin influences the structural patterns inherent in trip networks, the directionality of multicity travel, and the number and types of cities combined. As far as the role of destinations is concerned, they differ in their likelihood to serve as transit or endpoint locations, are more likely to connect other locations in a network when they are a major air traffic hub, and are not only combined with cities that are spatially close.

Multidestination Tourism

Multidestination trips have long been considered an important component of international tourism. Indeed, many travel agencies and tour operators have become very successful by bundling destinations. While the importance of multicity trips is apparent, very little empirical research has been reported, especially within the context of international tourists to the United States. The results of this study confirm that such trips are a fundamental feature of international tourism in the United States, representing almost one-third of the 6 million pleasure trips generated by Asian, European, and Latin American tourists during 1996–97. Comparative analyses among tourists from these three continents clearly document differences in the number and pattern of cities visited. For example, Asian tourists were more likely to visit multiple destinations (40.7%), include more cities (mean = 1.6 cities) during their visit, but stay for a much shorter time (mean = 7.7 days) than their European or Latin American counterparts. In addition, the popularity of American cities differed substantially among the three groups.

As expected, the three most popular cities of Asian tourists were Los Angeles, Las Vegas, and San Francisco. However, Orlando and New York were the two most popular destinations for tourists from Europe and Latin America, while ranking fifth and fourth for Asian tourists. As one would expect, Miami was also a popular destination for European and Latin American tourists (ranked 9 and 6 in popularity, respectively) but was not at all popular among Asians (ranking 28 among American MSAs). Further, it was confirmed that prior experience plays an important role in multidestination behavior but that its importance differs substantially by origin. That is, Asian tourists tend to significantly reduce (from 43.2% to 37.9%) their multicity trips with repeat visitation, whereas this increases significantly for Europeans (from 29.9% to 33.6%); the extent of Latin American multicity vacation is approximately the same for first time and repeat visits.

Several analyses were conducted to examine the nature (extent and pattern) of multicity tourism and to compare differences among tourists from the three continents. Specifically, it was hypothesized that US cities would differ significantly in terms of their role in international multicity tourism, that its nature and extent would differ significantly by the origin of tourists, and that familiarity with and spatial relationships

among US cities would influence the nature and extent of travel to these destinations. The results of this study clearly indicate that certain cities are more likely to support transit-type travel (Houston and Seattle) while others are more likely to be endpoints of a visit (Orlando, New York, and Los Angeles). Comparisons of the trip patterns by tourists from Asia, Europe, and Latin America also indicated large differences in the extent to which they combine American cities and the city pairs that were visited during the same trip. For example, Tampa–Orlando, Los Angeles–Las Vegas, San Francisco–Las Vegas, and San Diego–Los Angeles were identified as the most popular city pairs. The analyses also indicate that these patterns are linked to tourists' access points into the country (determined in large part by airline hubs and city size).

Importantly, the number of cities included in multicity trips is highly concentrated among few cities; for example, Asian tourists included only 10 destination pairs (Los Angeles–Las Vegas, San Francisco–Los Angeles, and San Francisco–Las Vegas were the 3 most popular) which represented 76.4%, whereas European and Latin American tourists required 20 destination pairs to reach approximately the same proportion. For Europeans, Tampa–Orlando, Los Angeles–Las Vegas, and San Francisco–Las Vegas were the three most popular destination pairs, whereas Latin Americans traveled mainly to Tampa–Orlando, Orlando–New York, and Orlando–Miami. Last, the results also indicate that actual distances between cities are not important if they are perceptually close, which has significant implications for the development of destination brands. In addition, the structure of existing airline transportation networks was found to influence the likelihood of cities to serve as important hubs in trip networks of international tourists. However, the correlation between the air traffic rank and betweenness centrality rank is far from being perfect, suggesting that there is plenty of room for marketing efforts to overcome possible shortcomings regarding the integration of city into transportation networks.

CONCLUSION

The analyses of the structural properties of the trip networks and the directionality of multicity patterns by origin strongly suggest that perceived accessibility has a substantial impact on multicity destination behavior. This finding clearly documents the role of hubs and transit cities, emphasizing the importance of connectivity and cooperative advertising which ''bundles'' destinations in the mind of the international tourist. In addition, the analyses confirmed that the extent to which a destination has been previously visited affects multicity tendencies. However, the extent to which repeaters offer substantial opportunity for destination marketing organizations depends upon the origin market; this highlights the need to conduct in-depth research of target markets.

The results presented in this paper illustrate the value of applying network analysis methods to the study of multidestination trips in addi-

tion to using descriptive approaches. The network analysis methodology adds insights into structural properties of such trips not available through descriptive measures alone. It also allows for significance testing with respect to structural differences that cannot be accomplished with traditional methods. Recent developments in network analysis approaches, such as simulation software and programs, to test multiple theories at multiple analysis levels (Monge and Contractor 2003) promise to further enhance the understanding of complex trip structures and should be considered in future research efforts.

The results of the study suggest that significant opportunities for packaging and cooperative marketing strategies exist for city tourism organizations in the United States and that differences in the multicity tourism behavior of tourists from the different continents must be considered when designing specific marketing efforts. In particular, the concentration of international trips among a very small number of US cities (Los Angeles, Las Vegas, Orlando, etc.) emphasizes the relative importance of these destinations to international tourists and suggests that cooperative advertising would be very beneficial in supporting/strengthening market share. Concomitantly, this concentration of international tourism among a few cities also documents the substantial challenge less popular cities (for example, Cincinnati, Milwaukee, Philadelphia, St. Louis) face in attracting significant numbers of international tourists. That is, a potential strategy for smaller and/or less popular cities to ''break through'' is to build closer marketing relationships with one (or more) of the primary destination cities. However, since the patterns appear to be highly entrenched and dependent on the corporate agendas of airlines and tour operators, substantial marketing and infrastructure development efforts would be required to actually realize new trip patterns (especially for the Asian markets).

Origin and familiarity were selected as proxies of perceived accessibility for this study. These variables are of course imperfect measures as they do not cover all aspects of accessibility and, on the other hand, may subsume differences in tourism behavior unrelated to accessibility concerns. From a practical marketing perspective, however, information regarding origin and repeat visits is readily available. Thus, differences in multicity tourism based on these measures are important as they can be easily used as the basis for differentiated packaging strategies. Yet, although this aggregate level analysis of existing secondary data has provided a number of interesting findings which offer important implications, further investigation is needed at the individual level to understand ''how'' cities are combined in single trips and ''why'' certain combinations are more prominent than others for certain types of tourists. Indeed, attitudinal measures and psychographic characteristics should be taken into account to provide a more comprehensive model of international multicity vacation. In addition, an important extension of this research should consider the meanings that different cultures assign to the various places as well as the processes underlying the social construction of this meaning. Last, only large MSAs were taken into account for the analysis presented in this paper; clearly

other interesting bundling opportunities might emerge from analyses of trip patterns that include smaller urban areas and other kinds of destinations, such as natural parks or resorts.

The purpose of this paper was to describe the nature and structure of multicity trips by international tourists to the United States. Within a larger context, the understanding of the processes determining the structure of travel using a network perspective offers important implications well beyond destination marketing. Following from a recent article by Lew and McKercher (2006), the spatial structure of travel can have major implications for transportation planning, tourism development, and impact management. It also provides important cues regarding the cognitive models tourists use to organize their knowledge of destinations. Indeed, the results of this paper and others (Gvili and Poria 2005; Jakle 1985; Jeng and Fesenmaier 1998; and, Selby 2004) suggest that cultural associations can play a significant role in the interpretation of place and should be further explored. Further, recent developments within the overall informational environment of tourists such as MySpace.com, Flickr, VirtualTourist.com, Tripadvisor.com and del.icio.us are expected to increasingly shape the overall structure of travel. Which destinations are selected and combined within a trip will change dramatically over the next decade as these social network-based Internet systems replace current mainstream media and other legacy systems, thus exposing tourists to more personalized and consequently relevant information about a greater number of destinations. This raises many important questions regarding the future of tourism, the emerging nature of tourist communities, and the meanings associated with destinations. It also points to the importance of network analyses such as those conducted in this paper to document the structure of tourism and the social ties that underlie tourist information exchanges. A

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