San Jose State University

From the Selected Works of Herman L. Boschken

January, 2008

A MULTIPLE-PERSPECTIVES CONSTRUCT OF THE AMERICAN GLOBAL CITY

HERMAN L BOSCHKEN, *San Jose State University*

Available at: https://works.bepress.com/herman_boschken/1/

A Multiple-perspectives Construct of the American Global City

Herman L. Boschken

[Paper first received, December 2005; in final form, February 2007]

Abstract

The term 'global city' bestows an image of an urban place that is contemporary, international, multicultural, 'wired', cosmopolitan, polarising and having geographically boundless power. Nevertheless, the literature fails to produce a common identity for setting the global city apart empirically and in analysing policy issues related to it. This paper argues and tests the proposition that the global city is better described and analysed from a holistic construct of competing perspectives. To do this, it: identifies seven global city dimensions; subjects the dimensions to a principal components analysis; and, uses the resulting composite factor to drive a K-means cluster analysis to differentiate 53 US urbanised areas. The results identify significant clusters that set apart global cities and provide a broadened base for cross-disciplinary comparative urban research.

Since Hall's brilliant treatise (1966), the term 'global city' has come to connote what nearly everyone refers to as a unique urban habitat acting as a portal and stage for world connectivity. It bestows an image that is contemporary, international, multicultural, 'wired', cosmopolitan, congested, polarising and commanding geographically boundless spheres of influence. However, even though the term is often bantered about as if everyone intuitively knows what it is, the scholarly literature produces a minefield of terminology and, at first glance, shows little evidence

of consensus in perspectives or analytical content (Nyman, 1996; Beaverstock *et al.*, 1999; Soja, 2000, ch. 7; Smith, 2001, ch. 3; Derudder, 2006).

Confounding a collective understanding of the global city is a plethora of similar-sounding terms, including 'international city', 'world city', '*weltstadt*', and 'mega-city'. Likewise, differing individual perspectives often are distinguished by whether the policy focus or conceptual interests are on economics, culture, immigration, environment and resources, health and poverty or politics. Although some

Herman L. Boschken is in the Department of Organisation and Management, San Jose State University, One Washington Square, San Jose, California 95192-0070, USA. Fax: 530 758 5557. E-mail: boschken_h@cob.sjsu.edu.

perspectives garner a greater following than others, few appear to acknowledge the global city as an interrelated complex system and none exists without considerable questions of relevancy and empirical authenticity.

The plethora of terminology and disparity in perspectives leave us wondering about discontinuity in studying global cities. Even though these competing terms and disparate perspectives may be viewed as individual anatomical parts of an integrated whole, they seldom form a collective understanding. Instead, they often present obstacles to producing a collective vision needed to set the global city apart as a complex system and to analyse policy issues related to it. Invoking the elephant metaphor, does the problem lie in trying to describe an integrated whole from the vantage of deconstructed anatomical parts? Or, does the highly contested field indicate that the term is simply hollow? Is it useful to see all cities as global in some essential way or does it make more sense to set apart certain cities as having a composite core of global dimensions not shared in their entirety by other cities?

Even for those who would see the global city as empirically distinct, more questions linger. How can one tell significant dimensions from those that are not? Should one dimension (such as scale, multiculturalism or interurban power) serve as a surrogate for all others? Is there an order of importance to the different perspectives (for example, to understand an elephant, does the trunk matter more than the tail)? To know the answers would certainly promote greater commensurability and comparability in urban research, but it also holds profound implications on what globalisation means at the local level and on how cities design specific urban futures that set a course towards being comprehensively global or not.

To address these questions, this paper urges a multiple-perspectives approach using the lens of developmental policy theory. It sees the

global city as a reflection of historical stages that evolved through interdependencies between globalisation pressures and intraurban developmental initiative. It argues that a sufficient empirical construct needs to draw dimensions both from *attributes* of the urban habitat (as a bounded complex system) and from the city's *relationships* with world-wide networks of activity (as a part of larger macro systems).

With this framework, the paper: identifies seven dimensions drawn from contemporary globalisation and consistent with the disparate perspectives defining the global city; subjects data for the dimensions to a principal components analysis; uses the resulting composite factor in a cluster analysis that differentiates 53 major US urban areas into global and less-global cities; and, draws implications about broadening the inter-subjective base for understanding the global city as a complex system.

The Multidimensional Global City: A Three-stage Evolutionary Development

Devising a robust construct that integrates different perspectives into a collective understanding of the global city is a difficult matter because scholars frequently come from different social science disciplines and have competing agendas about what should be studied. Some are interested in business and economic development; others are interested in equity and poverty. Still others focus on arts, entertainment and open space, while some examine traffic congestion and environmental quality.

Moreover, as a dependent variable, the global city garners different causal scenarios. One group of scholars may see global cities resulting from internal developmental policy promulgating a global microcosm within the city (for example, Clark and Hoffmann-Martinot, 1998; Nyman, 1996; Danielson and

Doig, 1982). Another group finds principal cause in their connectivity to world economic systems (for example, Alderson and Beckfield, 2007; Taylor, 2004; Castells, 1989; Friedmann, 1986). A third sees it as 'layered' historical artefacts, reaching back to antecedents from the 1800s (for example, Abu-Lughod, 1999). Are these central tensions and disparate perspectives unresolvable or is it possible to see through the differences to some meta-theoretical integration? To what extent are these central tensions the result of a parochial lens similar to the particularistic descriptions of the metaphorical elephant?

In search of a collective understanding of the multidimensional global city, history informs us that the second half of the 20th century revealed a vastly changed world order based on a contemporary form of globalisation. Characterising this post-WWII reordering as a developmental experience within the city, Clark (2004a, ch. 12) says that contemporary globalisation appears to have been a cumulative process involving a three-stage, partly overlapping sequence of economic, sociological and political transformations. Moreover, as world leader of many new trends during this period, the US appeared to represent the focal point of these transformations. The developmental impacts of evolutionary globalisation on American urban life become clearer upon closer examination.

Probably ignited by post-war reconstruction economics, the first stage of transformation involved a geographical separation of goods production from locations of product consumption. Although self-contained regional economies (containing both producers and consumers of a product) had diminished in importance in the US and elsewhere by WWII, by the late 20th century, the separation of production and consumption had taken on immense international proportions with the emergence of 'offshore' sourcing of goods and the creation of global markets.

Through a highly competitive system of remote multinational production sites controlled and co-ordinated by a new fiscal and logistical command structure (especially since 1960), this economic stage originally appeared as a concentration of demand on American soil offset by a global dispersion of supply (albeit skewed to the Pacific Rim).

Based on a premise that products could be made anywhere in the world without significant regard for per-unit transport costs, it was a stage underscored by a massive shift towards international trade flows made possible by an American-invented 'container revolution' in global shipping (Boschken, 1988, 1998). It was also underscored by the concentration in strategic cities of production-service firms needed to control the logistics of these flows from and among dispersed manufacturing sites to markets mostly in the US and Europe (Sassen, 2001; Thrift, 1994; Friedmann, 1986).

Eventually, the economic stage yielded some of its visibility to a second transformation sparked by a revolution in information and media technologies. It materialised in the rise of a symbols-driven cosmopolitan consumption, which concentrated on urban entertainment venues and post-modern interest in cultural immersion (especially since 1980). The 'global lifestyle' had arrived and brought with it mushrooming demand for culturally significant goods from all over the world and a host of 'quality-of-life' urban services, as well as the free movement of foreigners, information and ethnic lifestyles across national borders (Clark, 2001).

Media-driven celebrations and consumption of wares at international festivals, appreciation for ethnic foods and gourmet restaurant districts, and the presentation of 'world-event' theatrical performances, music concerts and art exhibits became standard preoccupations of many Americans (Clark, 2004a; Short *et al.*, 1996). So also did 'buying trips' to such global destinations as New York, London, Paris, Rome,

Hong Kong and Singapore, where at least a portion of the motive is cultural immersion. Arguing that “amenities are critical for most urban processes”, Clark emphasises that “this is news since most past theories [of developmental policy] stress work and markets, rather than consumption and amenities (non-market factors)” (Clark, 2002, p. 1).

More recently, these two stages appear to have given ground to a third involving a realignment of urban politics (especially since 1990), said to be founded on a ‘new political culture’ of fiscal conservatism and social liberalism (Clark and Hoffmann-Martinot, 1998). Being especially evident in a few select cities, politically important constituencies hold heightened aspirations for world-class status for their urban habitat that bestows membership in a global interaction spanning traditional political boundaries. Being economically conservative, they tend to expect public policy-making priorities to favour ‘productive’ developmental expenditures driven by the global forces of consumption and simultaneously to de-emphasise traditional welfare programmes that might otherwise sustain blight and perpetuate the dysfunctional lifestyles of an urban underclass (Abu-Lughod, 1999; McKenzie, 2001). Moreover, the realignment of priorities is accompanied by the decline of hierarchical political organisations, traditional bureaucracies and clientelism (Clark and Hoffmann-Martinot, 1998; Hawes, 2000; Bishop, 2000; Thrift, 1994).

In this spirit of economic development, political support is often thrown to public-private partnerships that plan and carve out post-industrial habitats from economically declining urban cores. Evidence of such consortia at work is found, for example, in the comprehensive development of new multipurpose central districts, having generously landscaped promenades threading together artfully designed high-rise business towers with entertainment and residential centres,

all made regionally accessible by stylish, technologically advanced rail transit. Satisfying to a productivity-minded fiscal conservative, the reclaiming of core cities in this way is said to reflect a forward-looking constituency determined to advance the global position of its city, competitively, symbolically and by appearance.

Being socially liberal, these same constituents also express deep commitment to their own personal freedoms and exhibit greater tolerance for and appreciation of foreign or ethnic cultures and variant lifestyles. As a consequence, many cities have developed social programmes which invite and encourage the growth and integration of a multicultural community. Involving more than segregated ‘island communities’ (Park and Burgess, 1967) serving as a city’s cultural or lifestyle ‘showcases’ (for example, San Francisco’s Castro District, Chinatown, Little Italy), a new integration is being formed by ‘hybridising’ (Tajbakhsh, 2001) the city’s legislative body, business leadership, community organisations and public gathering-places. Unlike earlier regentrification, a new paradigm of ethnic and lifestyle diversity seems to have fostered a multicultural community model which enlarges civil liberties and international experiences for most of those choosing to be immersed in it.

This historical interpretation of three partially overlapping stages of globalisation leads to a question about how different cities, especially North American cities, may have fared in the transformations. From a developmental standpoint, the three-stage transformations point to a fundamental rethinking of the role of cities as connector nodes in a multinucleated global network of economic, sociocultural and political interaction and exchange. Even more pointedly, it leads us to expect the resulting global city to be more than a purely techno-economic outcome and more than a passive participant in a corporate-driven macro world system. As seen both in

attributes of urban activity and in flows resulting from interurban relationships, the global city should exhibit several distinguishing dimensions and be more diverse in its make-up and influence than a linear information-processing model would predict.

As caldrons of contemporary globalisation, global cities should exhibit a developmental process now spanning 50 years and parallelling that of the three-stage transformations. They have emerged incrementally by brewing and incorporating numerous economic, social and political forces of a persistent post-WWII globalising world. They also emerged under American influence since the transformations followed a certain temporal and geographical ordering that, until recently, placed the US at the centre of contemporary global city design and imitation.

Yet, not all American cities have shared equally in the evolutionary transformations. While some cities were comprehensively shaped and empowered by multilateral connections and protocols of contemporary globalisation, many were not. While some cities actively employed developmental policies in conjunction with all three transformation phases, many did not. As a result, even though “all cities are globalizing” (Taylor, 2004, p. 42), only a few would be expected to exhibit the comprehensive multidimensional changes associated with all three stages of contemporary globalisation.

Hence, in a highly discriminating fashion, “globalization can be deconstructed in terms of the strategic sites where global processes materialize” (Sassen, 1998, p. 392) and are grounded in what “geographically situated people do” (Smith and Timberlake, 2001, p. 1657). As the differential result of both external globalising demands and internal developmental policy responses, those that are global cities should empirically appear individually as a strategic platform of world connectivity. Even though most cities have some global attributes and connectivity,

‘platform’ cities would be expected to contain a comprehensive set of dimensions reflective of the economic, social and political components of the post-war period of tri-stage globalisation.

Moreover, these dimensions may be categorised into two types of urban artefact. First, the global city should contain a critical mass of central functions and infrastructure associated with a world assemblage of ‘parts’. These interactive parts are engaged in the co-production of applied knowledge, symbolic creations, capital management, policy co-ordination, transaction control, logistics and mobility. Secondly, the global city should exhibit the ‘on-site’ cultural and political content of globalisation provided by an urban milieu of scientific research and education, media and entertainment, and multicultural amenities. Referring to these as dual identities of function and content, Nyman (1996, p. 6) argues the global city is about both “the city in the world” and “the world in the city”.

From Nyman’s argument, one might expect that different research perspectives would have been integrated into a collective empirical understanding of the global city as a complex multifaceted system. However, with few exceptions (such as Short *et al.*, 1996), most of the past research is single perspective and not interdisciplinary. For example, the ‘command-and-control’ perspective (Alderson and Beckfield, 2007; Derruder and Witlox, 2005; Taylor, 2004; Sassen, 2001; Friedman, 2000; Connell, 2000; Castells, 1989), the field’s dominant paradigm, expresses primary interest in the relational power of global cities in a ‘world cities network’ of corporate exchanges and business travel.

Derived from economic and organisation theories, its focus is specialised on macro-system relationships where it seeks to decipher whether cities relate to each other according to a hierarchical pattern of interurban competition or according to a non-centralised network of mutual interaction. Hence, the

perspective *by itself* is “not well suited to explain internal social characteristics precisely because of its theoretical emphasis on the city’s external economic functions” (Nyman, 1996, p. 7). As a result, issues of multiple causality and the understanding of the global city as a complex system are foregone.

The limits of a single perspective are found in other significant work as well. Most, for example, see the global city in monotone by viewing it from such individual perspectives as international travel flows (for example, Smith and Timberlake, 1995) or viewing the global city principally as an entertainment machine (for example, Clark, 2004a). Indeed, when multiple perspectives underpin the core analysis, they tend to be found in research using a small-*n* set of comprehensive cases (for example, Abu-Lughod, 1999; Savitch and Kantor, 2002) which are not comparative of global and less global cities and which necessarily restrict the ability to generalise.

By contrast, the research presented here is a response to the lack of forward movement in comparative empirical analysis founded on seeing the global city as a multidimensional complex system. It is unique in that it is the only known work that empirically distinguishes global cities in a multiple-perspectives framework using large-*n* quantitative techniques driven by a conceptual interpretation of contemporary globalisation. By bringing several perspectives together, this paper identifies the global city as a geographical site where the three stages of globalisation materialise in the form of both global functioning and cosmopolitan content. In seeking global city dimensions, it includes both the flows of people, information and fiscal resources to and from world-wide locations and the global attributes of urban place.

The paper should not be construed, however, as an attempt to merge disparate parochial perspectives into one super model. Instead, it seeks to recognise multiple perspectives about the nature of a complex urban

system (Norgaard and Baer, 2005) and to show that its dimensions have the capacity to be associated in a collective construct to understand its multiple workings and consequences. On these footings, the collective literature appears to provide a basis for seven distinct dimensions.

1. A large monocentric urban area. Given the number of functions in which a city needs to be broadly proficient and competitive to partake fully in globalisation, size appears to be a major consideration for achieving holistic critical mass. Although some like Sellers (2001) disagree, large size enables the global city to have the capacity, access to resources and acknowledged status to maintain a formidable presence across those functions required of a lead actor on the global stage. A small remote college town may seem to be immersed in global connectivity, but it is limited by the capacity and scope needed for full global functionality.

In addition to size, some researchers contend that to be a global city, large urban places need to exhibit a monocentric conical form, featuring concentric gradients of activity density descending outwards from a dominant core (Lang, 2003; Boschken, 2002; Sassen, 2001; Castells, 1989). Describing urban spatial form, monocentric is one end of a continuum that refers to the physical layout of a city like New York. By contrast, the sprawled, non-parametric (multinucleated) pattern of Los Angeles illustrates the other end of the continuum. Implying a tie between global command functions and urban spatial form, Taylor and Lang (2005, p. 3) say that global businesses seek out cities having a dominant core: “A key feature of firms providing [producer] services is their concentration in major cities, especially their downtowns”.

2. Command centre for the global economy. The world centrality of an urban area is based in part on the city’s role as a node of

power and connectivity in the global economy. Taylor (2004, p. 52) argues that such areas have taken advantage of information technologies to become "strategic places for servicing global capital" distributed world-wide by "offshoring". As a 'command centre' (Friedmann and Wolff, 1982) involving an 'agglomeration' of producer-service agents (Sassen, 2001), the global city is a strategic place of information processing and resources control. Bringing together complex, interacting systems of cyberspace technologies and organisational processes, the agglomerated resources of international banking, consulting, accounting and other economic services are applied to non-routine decision-making employed in co-ordinating and controlling fiscal, material and people flows at the world scale (Sassen, 2001; Connell, 2000; Castells, 1996, 1989).

This dimension, however, can be seen in two ways. First, as emphasised by the world system perspective, producer service firms create and maintain global networks to communicate among themselves and affiliates in branches located in a 'matrix' of global cities. "As such, these global service firms 'interlock' the cities in which they have presence" (Taylor and Lang, 2005, p. 3), such that "the most basic measure of a city is its connectivity in relation to all other cities in the matrix" (Derudder *et al.*, 2003, p. 878). In this way, global command networks are finite and mostly limited to global cities.

However, from another view, a command centre's principal role in global economics is to facilitate and control physical and economic resources world-wide and that includes dispersed manufacturing locations (often in emerging countries) which usually are separate and remote from command centres (Sassen, 2001; Friedmann, 1986; Hymer, 1971). In this second way, the connectivity, information flows and relational power of a command centre are likely to be different from and even greater than estimates made

from 'relational data' for a matrix of global cities alone.

Both of these ways suggest that, unlike previous eras where a city's economic centrality was identified principally by a dominant position in actual manufacturing and materials flows, today's global city is a dominant site for the post-industrial economy of symbolic transactions, knowledge management and capital accumulation.

Major corporate transactions today typically require simultaneous participation of several specialised firms providing legal, accounting, financial, public relations, management consulting (Sassen, 2001, pp. 11–12).

Due to great demand for face-to-face relationships (Heldman, 1992; Noam, 1992) and 'agglomeration economies' (Sassen, 2001) achieved by in-person collaboration, these consortia of service co-producers find substantial benefit from clustering in a global city (Derudder *et al.*, 2003; Porter, 1998).

3. Global entertainment machine. Another essential but less discussed dimension of the strategic global platform is urban entertainment and media production. Although the principal example of this is often mistakenly thought to be sports venues and stadia (Nelson, 2001; Coates and Humphreys, 1999), the entertainment activities having far greater and broader significance for global connectivity are cultural festivities, performing arts, media and motion pictures, museums, restaurant districts, international retail complexes and 'urban wilderness' (Clark, 2004a; Abrahamson, 2004; Florida, 2001). Although Friedmann (1986, p. 74) refers to this dimension as only "an ancillary function", entertainment attracts international attention in its own right for its creative and innovative production of symbolic knowledge (Eakin, 2002; Short *et al.*, 1996) as well as providing the necessary consumption opportunities that attract cosmopolitan, globe-trotting,

command-centre professionals to live in a particular urban area.

4. World centre for research. The omnipresence of a reputed multidisciplinary research centre catering to world-wide needs for advanced knowledge and discovery appears to be another essential differentiating dimension. Typically consisting of a maze of university, government and tax-exempt organisations that fund and provide accessible analytical resources to a 'global village' of policy-makers (Brint, 2001; Kerr, 1963), this research capability is often seen as an incubator where fundamental breakthroughs in basic research occur. Consisting of consortia of different and sometimes overlapping policy specialisations (such as world health and medicine, aerospace and defence, electronics, climate and resources), the research centre as a whole provides a broad synergistic crucible acting as a magnet for institutional basic research and graduate education spanning the sciences, social sciences, arts and humanities. Its contributions as part of a city's strategic global platform are many, but in drawing leading researchers and vested interests within and beyond US borders to the city, it enriches the city's centrality in providing cutting-edge scientific knowledge.

5. Global centre of multicultural exchange. In addition to its roles in world-wide movements of information, money and material, a global city is also a nexus for multinational migration, integration and intercultural exchange (Sassen, 2004; Rath, 2002; Tajbakhsh, 2001). Multiculturalism is about '*weltstadt*'—the world in the city (Nyman, 1996). Even though considered a dimension of its own, this cultural attribute may have received its initial boost from the employment needs of the global platform, including a professional class of corporate managers and scientists and contingents of inexpensive labourers needed to support the global platform

functions (Beaverstock, 2004; Abrahamson, 2004; Perkins, 1997). Moreover, command-and-control of global activity flows are increasingly multilateral and no longer exclusively controlled by those from Western culture (Frank, 1998; Smith and White, 1992). This shift along with other significant late 20th century events spurred on the relocation of subsequent transplants and their families from many different cultures of the world.

As with the bell-cow metaphor, people of the same culture and social class as preceding migrants followed them to new locations, ultimately creating numbers large enough to fashion new communities modelled from the old. As a centre of intercultural exchange, the global city brings together many more of these in proximity to each other than cities focused more on regional or national interests. Making multicultural awareness an everyday experience, the global city is a place of greater opportunity to share diverse heritages whether it is from traditional 'showplace' ethnic neighbourhoods or the evolution of culturally hybridised settings (Tajbakhsh, 2001) in places of work and play. Alongside the positive aspects of multiculturalism, it may also be a place reflecting a chronic world condition of social polarisation.

6. International transport gateway. International travel and movement of goods have also been distinguishing features of globalisation indicating a city's connectivity to foreign lands. Yet, in the modern sense of jet travel and multilateral foreign trade, one needs only to compare the cosmopolitan atmosphere of a global city airport with one that is not (Derudder and Witlox, 2005; Matsumoto, 2004; Keeling, 1995) or observe the flow of container traffic at 'load-centre' seaports typically found in urban areas contending for global city status (Erie, 2004; Boschken, 1988; Danielson and Doig, 1982).

For the movement of both people and goods, an important limiting factor regarding

the geographical extent of market and non-market activities has always been the cost of transport. However, with the invention of jet aircraft and the container revolution at seaports, these historically high costs were reduced by the 1970s to minuscule levels (i.e. the cost per unit for transport became virtually insignificant to individual cost-benefit calculations), whereby nearly all markets (including the siting of producers and movements of consumers) could become global (Boschken, 1998, 1988). In making decisions about location and distance, travellers and producers found that the concentration of a few access points (global city gateways) in a global logistics network provided them with the necessary efficiencies in time and scale to live or produce at great distances from points of consumption.

7. Rail mass transit infrastructure. Rail transit in US cities enjoyed an early history of eminence but was cut short by widespread adoption of automobiles and replacement of rail with buses (Jones, 1985). Its crucial role in the design and development of big, dense, post-bellum cities spanned less than 50 years (late 1800s to the 1930s). Nevertheless, since the 1980s, this mode (both heavy commuter and light rail) has made a comeback of sorts. Driven by the economic revitalisation of core cities along with flashy new technologies, rail's return to vogue is marked by its essential place in defining the global city image and as a signal that the city is practising a 'new political culture' of fiscal conservatism (public funding of productive infrastructure) and social liberalism (providing clean, world-class intraurban mobility accessible to all).

Even though the physical presence of a vibrant rail transit system is a visible reminder of a city's investment choice in post-modern global symbols, its value is not usually assessed in conventional use terms. For most American cities using rail, ridership typically falls short of what would be expected given this

infrastructure's centrality to global city status. Nevertheless, the major consideration for adopting rail over bus investment has been rail's superiority in providing the appearance of technologically advanced, safe, clean, comfortable, permanent and on-time transit services fitting the expectations of a bustling global city clientele (Boschken, 2002). Along with a stylised cityscape of multipurpose high-rise complexes anchored in generously landscaped promenades, the technologically superior rail transit system imparts character, animation and permanence to the urban environs of the global platform.

To appreciate more fully the potential synergy of these seven disparate dimensions, one might conceive of them as holistically interacting in a way that simultaneously imprints the momentum and routine of the world stage onto an urbanite's daily activities and consciousness. Global cities possess a "complex and multifaceted" character (Sassen, 2001, p. 351) which immerses urbanites in a different comprehensiveness from that found in cities exhibiting minimal global attributes.

The resulting habitat does not reflect an 'upside' for everyone subject to it and socio-economic polarisation is believed by some to be a common and significant consequence (Sassen, 2001; Walks, 2001). Some are greatly benefited by a global platform while others are marginalised and disabled. Moreover, the dimensions should not be interpreted as supporting a 'hierarchy of world cities' paradigm (Friedmann, 1986). Instead, they are multiple distinctions for a certain group of American cities which actually may have few direct interdependencies with one another economically, sociologically or politically.

In summary, the strategic platform of global connectivity along with its supportive infrastructure and multicultural setting imparts the visible traces of a global city's 'multiplexity'. From an economic sense, the platform contains the network 'command

centres' engaged in co-producing and routing the knowledge required in managing the world's massive list of transterritorial fiscal, material and people flows.

Being in a [global] city becomes synonymous with being in an extremely intense and dense information loop ... Global cities are, in this respect, production sites for the leading information industries of our time (Sassen, 2001, p. xx).

Yet, the platform is more than corporate information-processing alone. Alongside and sometimes integral with the economic component of global knowledge-processing is a spectacular array of sociocultural and political exchanges in the world arena dedicated to idea formation, public policy, symbolic creations and entertainment. When Clark and others (Clark, 2004a) speak of the 'the city as an entertainment machine', they refer to the transterritorial exchanges that exhibit "more than production and finance and jobs; it is increasingly about consumption, culture, lifestyle, politics, and religion—which are not deterministically linked to investment or capital" (Clark, 2002, p. 2).

In addition to the platform itself, the global city is distinguished by a highly specialised urban infrastructure uniquely designed for appearance and mass mobility of information, goods and people in accordance with the requirements of global connectivity. While many cities have sought to mimic aspects of the global city profile, few can claim integrated development of and high demand for such infrastructure as state-of-the-art electronic systems, stylistic advanced transit systems and global gateway complexes.

Methodology

Most global city 'rosters' are based on very limited empirical data skewed by a single perspective or factor of identity. A few do employ significant statistical analysis, but nearly all remain steadfast in the use of a

single variable for defining a global city. By contrast, the research here attempts to establish a valid and reliable empirical construct that brings together a broader contribution of scholars than currently found in any one perspective. For example, even though the 'command and control' perspective is mostly interested in world network exchanges between global cities (a macro organisational focus), its incorporation here as one of several dimensions in the construct complements research by those primarily interested in globalisation's power and influence on the *internal* workings and conditions of individual global cities (a micro organisational focus). Hence, the hybridised construct might act as a bridge for integrating individual research perspectives and their empirical results into a more robust foundation for understanding the American global city as a complex system. It is to put the whole elephant into the equation rather than deducing its nature from the skewed perspective of any single anatomical part.

To provide a statistical basis for the analysis, empirical variables corresponding to the seven dimensions were selected and their respective data collected for 53 American 'urbanised areas' (US Bureau of the Census, 2002) having populations greater than 500 000. With these data, the variables were subjected to a principal components analysis to determine the suitability of using a single factor instead of individual dimensions to identify empirically the 'global city'. Finally, using a K-means cluster analysis, the resultant global city factor was used to differentiate the sample of American cities into global cities having a distinctly different profile than less global cities. This particular cluster technique is also useful because it provides information for future research on how far a cluster member is from a cluster's statistical centre rather than determining mere membership.

The analysis was done in two stages. First, the cluster analysis was run for a two-cluster

model to produce dichotomous results (i.e. global vs minimally global cities). Since some cities have a “limited set of global-city functions” (Sassen, 2001, p. 351) and therefore may be neither global nor minimally global, the analysis was rerun for a three-cluster model which produced a trichotomous scale (i.e. global, partially global and minimally global). This method allows the analysis to identify those that achieve global city status by specialising in certain dimensions more than others. This condition is particularly important in light of “uneven globalization” (Beaverstock *et al.*, 1999, p. 457), which is described as a primary concentration of global activity along an axis that includes North America, Pacific Asia and western Europe. For example, Miami may be a lesser global city because its connectivity is primarily with Latin America (and outside the axis).

The second stage then compared the results of the factor-driven cluster analysis with results determined by the individual global city dimension variables. Theoretically, cities included by the factor as global or partially global should have proportionally higher values for each of the individual dimensions identifying them than those the factor clustered as minimally global. The object here is to see the degree of convergence in results by comparing cities included by the factor clusters with those included by the dimensions individually (i.e. from the viewpoint of individual perspectives). This comparison also shows where specialisations differ among cities and especially allows partially global cities to be understood in this light.

To accomplish these aims, the individual dimension variables were operationalised by empirical indicators that represent traces of activity whether they happen from accumulating wealth by transaction, producing world-class entertainment, immersion in world cultures within the city or transport around the urban environment and through

its global gateway. The following variables are defined according to the construct’s seven dimensions.

1. Scale and form. Two variables were used to represent this dimension empirically. The first is called *city scale* and is defined, using 2000 census data, as a scaled variable of an urbanised area in square miles (US Bureau of the Census, 2002). According to the census, an urbanised area consists of a central place and adjacent territory with a general population density of at least 1000 people per square mile for an area containing at least 50 000 people. The designation may contain part but not all of the land within an SMA or counties surrounding a core city and therefore may not coincide with these other area boundaries. The second variable is called *urban form* and is defined as the conical shape of activity density within an urbanised area. This was calculated from 2000 census data as a scaled variable of the proportion of the urban population living and working in the central city (i.e. the number living and working in the central city + the number working but not living in the central city, divided by the total area population).

2. Global command centre. Since the command centre consists of multiple interdependent economic and information-processing activities, no single variable adequately reflects the holistic and integrated functioning of this vestige of a global platform. Some researchers (for example, Alderson and Beckfield, 2004; Taylor, 2004) have used a single measure such as the number of multinational corporate headquarters (or regional headquarters) found in a city. By itself, this is a relatively crude measure because it represents potential command centre capacity or connectivity rather than actual activity. Corporate number and function are not the same.

Moreover, the measure limits consideration to corporate actors rather than representing the broader field of command centre exchanges involving governments and NGOs. Washington, DC, for example, may show artificially low on a global command centre scale using corporate headquarters because the city's command function consists of more than corporate activity alone. The matter is complicated further by whether one uses relational data for the connectivity of a 'world city network' (for example, Derudder *et al.*, 2003) or data reflecting connectivity to the whole world of controllers *and* producers. The latter would seem to be more consistent with a global city concept where relationships include not only collaborative ones among command centre actors but also command relationships with 'hinterland' production actors in locations separate from command centre cities (Sassen, 2001; Hymer, 1971).

For these reasons, the command centre dimension is empirically estimated for the statistical analysis using a factor of three variables representing sub-parts of the economic platform that avoid (albeit imperfectly) some of these problems. They comprise pay levels of financial services employees; annual receipts for professional service firms (such as international consulting, legal and accountancy firms); and, information services annual receipts (adjusted to reduce the statistical contribution of call-centre receipts which have little to do with command centres). Pay of financial employees is used instead of firm receipts to differentiate better between domestic and international transactional activities. Global command centre actors are paid significantly more than domestic counterparts (for example, global corporate banking vs regional or retail banking) and higher pay levels should reflect the distinction.

All data were gathered from the Economic census of the US (US Bureau of the Census, 1997). The second and third variables use

data derived on a North America Industry Classification System (NAICS) basis which replaced the old SIC system used prior to 1997 for organising enterprise data. This choice of three variables is supported by a principal components analysis that determined a single factor, called *command centre*, accounting for 80 per cent of the three-component variance (eigenvalue = 2.39).

3. World-class entertainment machine.

Getting an empirical grasp on this dimension is no easy matter. First, there is little uniformity across cities in data collection except for very aggregate statistics of employment levels and receipts for urban entertainment. Even with these statistics, definitions of what constitutes entertainment are often in question (Markusen and King, 2003). For example, do street vendors contribute to this dimension? If so, how should this sub-category be estimated, since their numbers and receipts seldom are captured in census or other protocol-based statistics? Without a better means, the variable adopted here for *entertainment* uses 1997 NAICS data and is the combined annual sales receipts for arts, entertainment and recreation (US Bureau of the Census, 1997).

4. Global research crucible. Like entertainment, measuring the research centre dimension also poses some empirical difficulties. First, there is much controversy over what constitutes non-business 'research'. For example, basic stem-cell research promises to have enormous impacts in a world-wide setting, but much of it in the US is dependent on government funding which compromises or distorts the dimension with politicised and prohibitory requirements (except perhaps California and a few others). Can such skewing of resources produce reliable data when comparing cities according to this dimension?

Secondly, there is a question of research productivity. Ideally, the 'yield rate' (i.e. amount

of research, relative to inputs, that ultimately becomes useful as breakthroughs) probably would provide the most accurate estimation. However, we know that the amount of resources (i.e. grant funds, contract receipts, manpower) does not correlate well with discovery, invention or outcome productivity. Since a research centre's reputation may come from either the sustained resources pumped in or its outcomes, is there a uniform concept of productivity applicable to judging research impact on the global arena? Lacking a source exempt of these problems, the widely used 1997 NAICS data (US Bureau of the Census, 1997) was selected for a continuous-scaled variable called *research crucible*. It includes the total annual receipts for research at university, government and tax-exempt institutions.

5. World multiculturalism. Since multiculturalism involves the integration of many foreign cultures and entails several aspects of migration, emersion and participation in city life, no single variable is adequate for estimating this dimension. Instead, a factor, called *multicultural exchange*, was devised from several aspects that were captured by two scaled variables in particular. Using 2000 census data, the first is the percentage of the urban population that is foreign-born. It reflects not only the breadth of multiculturalism in the urbanised area, but also the recency and intensity of the cultural transplantation (and is therefore consistent with the contemporary meaning of globalisation in the post-WWII period).

The second variable is the economic contribution of ethnically owned businesses adjusted for cultural diversity. It is an interaction variable created as the product of annual sales receipts (as defined by the 1997 economic census) and the diversity of minority ownership (a dummy variable constructed from economic census data on minority ownership proportioned by ethnic group, where 1 = skewed to a single minority having

more than 50 per cent ownership of minority businesses; 2 = slightly skewed with two dominant minorities; 3 = diverse ownership). The choice to factor these variables is supported by a principal components analysis that determined a single factor accounting for 82 per cent of the two-component variance (eigenvalue = 1.65).

6. Global gateways. This dimension focuses on the role of international traffic in differentiating the global city. Two variables were employed, each of which represents the relative magnitude of flows in either people or goods through cities to and from the world. The first measures the global gateway dimension in terms of world traveller movements.

For concerns similar to those expressed about relational data for the command centre dimension (see p. 9), choice of airline data confronts an important methodological distinction regarding relational scope and the meaning of this global city dimension. When thinking of airline traffic flows as a marker of the global city, existing research (see, for example, Derudder and Witlox, 2005) ties airline travel to a 'world city network' determined in prior work (Alderson and Beckfield, 2004; Taylor, 2004) to be a 'matrix' of global command centres. Hence, their airline data do not look at passenger flows as a 'gateway' indicator reflecting world-wide connectivity, but as another measure or sub-category of the command centre perspective.

Although such an approach is warranted for determining a city's centrality or rank among those in a world city network, it does not speak to a city's centrality in the world at large which contains not only global city command centres but also geographically separate 'offshore' production facilities dispersed widely across the globe (often in emerging parts of the world). Since command and connectivity are also about control and co-ordination of a global system of production

and consumption, restricting air passenger traffic to the global city matrix alone leaves out much of the relational field and restricts seeing the global city from a separate dimension in a collective of multiple perspectives.

The airline data used here for the global gateway dimension are not circumscribed by a pre-determination of a global city matrix or network. Although imperfect, the variable's broader scope incorporates international travel at US airports as measured by the number of foreign passengers arriving non-stop from and departing non-stop to any commercial airport outside the US (US Department of Transport, 2001; individual airport communications). This was constructed as a scaled dummy variable after comparing an airport's percentage of 2000 international passengers with the US 2000 total number of 143.5 million (where 1 = minuscule or no international passengers; 2 = some international traffic; 3 = secondary international gateway; 4 = primary gateway).

The second variable is a container seaport's foreign waterborne trade for 2000 as measured in container short tons (US Army Corps of Engineers, 2000). It is scaled according to a port city's centrality in the intermodal logistics of foreign trade (where 1 = a non-port city; 2 = marginal miscellaneous cargo port; 3 = small container centre; 4 = secondary container load-centre; 5 = primary load-centre). Since one variable represents the centrality of gateway traffic flows in people and the other in goods, the two components were factored to create a single variable called *international gateway* which accounted for 81 per cent of the two-component variance (eigenvalue = 1.63).

7. Rail transit infrastructure. The variable for this dimension is called *rail capacity* and is defined as the relative amount of rail capacity in the mix of rail and bus service provided by an urban area's public transit authority. Since the vast majority of the US

population (about 97 per cent according to the 2000 census) elect not to use urban transit for intraurban travel, capacity is probably a more accurate empirical measure of transit's visibility in marking the global city than ridership consumption. Whether transit vehicles are full or empty may have less to do with 'showing' the urban area's global vitality than whether the system's mere presence (i.e. capacity) gives a sense of bustle, freshness and permanence (Boschken, 2002). The measure is a scaled dummy variable derived from Federal Transit Administration data (Federal Transit Administration, 2000) on the transit agency's number of rail vehicles in operation and the number of directional route miles in the system (where 1 = bus-dominated/no rail; 2 = marginal rail integration; 3 = high rail integration; 4 = rail-dominant).

Table 1 reports descriptive statistics and inter-correlations for all original non-factored variables. Nearly all variables are highly intercorrelated (significance is at the 0.01 level or better using a two-tailed method). The variables of Dimension 1 (urban scale and form), however, show an unexpected high divergence in correlations. While scale appears to share highly significant associations with other global-city dimension variables (ranging from $r = 0.86$ to $r = 0.33$), urban form has either insignificant relationships with others or is inversely correlated (ranging from $r = -0.44$ to $r = -0.28$).

In addition to clearly exhibiting much less significance than the others in describing a global city phenomenon, the urban form's negative associations also suggest that global cities may have a tendency to experience more sprawl than less global cities. This is contrary to some research notations (Taylor and Lang, 2005; Lang, 2003; Boschken, 2002) that global cities may be marked by a concentration of activities in a dominant urban core. There may be several reasons for this, but of significance is the fact that post-WWII

Table 1. Dimension variables: descriptive statistics and intercorrelations for 53 US cities

Dimension variables	Standard		1a	1b	2a	2b	2c	3	4	5a	5b	6a	6b	7
	Mean	deviation												
1a Urbanised area scale	730	610												
1b Urban form	0.5	0.2	-0.38											
2a Financial serv pay	41.2	11.6	0.80	NS	—									
2b Professional serv rec	7736.3	9640.8	0.86	-0.32*	0.79	—								
2c Info serv rec (adj.)	129.2	98.5	0.58	-0.28*	0.54	0.75	—							
3 Entertainment	1146.9	1508.8	0.77	NS	0.69	0.82	0.47	—						
4 Research crucible	22.7	391.3	0.54	NS	0.58	0.79	0.65	0.45	—					
5a % foreign-born	12.6	8.7	0.33*	NS	0.37	0.49	0.33*	0.52	0.35*	—				
5b. Divers minority ownership	16.0	32.8	0.60	NS	0.57	0.76	0.46	0.92	0.42	0.65	—			
6a Seaport load-centre	1.9	1.2	0.52	NS	0.53	0.54	NS	0.60	0.33*	0.43	0.64	—		
6b Internal airport passngr	1.6	0.9	0.79	-0.36	0.64	0.79	0.57	0.74	0.43	0.59	0.75	0.63	—	
7 Rail transit capacity	1.6	0.9	0.73	-0.44	0.66	0.78	0.53	0.58	0.70	0.44	0.53	0.53	0.67	—

Notes: * = significance at 0.05 level; all other correlations significant at 0.01 level or greater; NS = not significant.

Sources: US Bureau of the Census (1997, 2002).

growth in most US cities emphasised sprawl regardless of pre-war development form. Although Los Angeles is thought of as an extreme case, this happened across the country in both residential location and employment opportunities where the auto severed the need for proximity and caused journey-to-work patterns to involve high levels of cross-commuting. Hence, the low significance of this variable's association with others led to the variable being eliminated from further consideration as an empirical marker of the global city.

The remaining dimension variables met expectations for strong interrelationships. This implies nothing about cause and effect among the dimensions, but the multilateral relationships are consistent with the thesis that global cities may be distinguished as complex systems and according to a pattern of specific dimensions. The strong intercorrelations seem to be uniformly spread among most variables. The least associated in the variable mix is percentage of the population that is foreign-born (one of two variable markers for the multiculturalism dimension).

In addition to the original variables, factors were produced for three of the dimensions which could be more robustly estimated by

consolidating two or more original variables. As shown in Table 2, these include the command centre, multiculturalism and global gateways dimensions. The factors are very highly correlated with their derivative variables (in bold), as well as significantly associated with other dimension variables. Consistent with the choice to employ factors in lieu of a single variable for dimensions best represented as multifaceted, the results reported next use the factors instead of their derivatives. These include a command centre factor consisting of financial services pay, professional services receipts and information services receipts (adjusted), a multiculturalism factor consisting of percentage foreign-born and diversity in minority ownership and a global gateways factor which consolidates variance for container shipments at seaports and international passengers at airports.

Results

The results of this inquiry are shown in two parts. The first is the factoring of dimension variables to determine if a single composite factor can be empirically determined to represent the complexity and diverse make-up of global cities. A principal components

Table 2. Dimension sub-factor correlations with dimension variables, 53 US cities

<i>Dimension variables</i>		<i>Command centre factor</i>	<i>Multiculturalism factor</i>	<i>Global gateways factor</i>
1	<i>Urbanised area scale</i>	0.84	0.51	0.73
2a	<i>Financial serv pay</i>	0.87	0.52	0.65
2b	<i>Professional serv rec</i>	0.95	0.69	0.74
2c	<i>Info serv rec (adj.)</i>	0.85	0.43	0.44
3	<i>Entertainment</i>	0.74	0.79	0.74
4	<i>Research crucible</i>	0.76	0.42	0.43
5a	<i>% foreign-born</i>	0.45	0.91	0.57
5b	<i>Divrs minority ownership</i>	0.67	0.91	0.76
6a	<i>Seaport load-centre</i>	0.49	0.59	0.90
6b	<i>Internl airport passngers</i>	0.75	0.73	0.90
7	<i>Rail transit capacity</i>	0.74	0.54	0.67

Notes: all correlations significant at 0.01 level or greater. Correlations of factors with their derivative variables are shown in bold.

analysis found that the global city factor incorporates 70 per cent of the variance of the individual dimension variables (eigenvalue = 4.94). As shown in Table 3, it is very highly correlated with all the original variables and their dimension sub-factors (range: $r = 0.96$ to $r = 0.60$).

The second part of the results has to do with application. To the extent that a valid concept-based factor can be produced to represent the multidimensional nature differentiating the global city, can it then be used as the basis for identifying global cities in the study's sample of 53 US cities? Applying the global city factor in a K-means cluster analysis, two alternative cluster models were created. As shown in Table 4, the first included two clusters (global and minimally global cities). This dichotomous method identified 8 cities as global around a cluster centre of 2.00 and the remaining 45 around a centre of -0.36 ($F = 136$; significance = 0.000). The second method relaxed the dichotomy by

allowing for three clusters (global, partially global and minimally global cities). This was done to introduce more scalability into the distinctions and allow for the possibility that some of the cities may not be holistically global (i.e. bearing traits strictly adhering to all global city dimensions) but exhibit enough of the dimensions to be designated 'partial global cities'. This trichotomous technique produced 2 global cities around a cluster centre of 3.42, 9 partially global cities around a centre of 1.25 and 42 minimally global cities around a centre of -0.43 ($F = 164$; significance = 0.000).

Finally, the individual urbanised areas in the sample identified by the factor-driven cluster analyses as global and partially global cities are reported in Table 5 according to the two- and three-cluster methods. For each of the cities identified using the global city factor, the table also shows the number of individual global city dimensions the cluster analyses found for each city. For example, in the two-cluster model, New York is ranked first of eight in the global city cluster and was found in all seven of the individual dimension clusters for global cities. Los Angeles is second and was found in six of the seven individual dimension clusters (it fails to be included as a global city on the rail transit dimension). The results for these two cities were identical for the three-cluster method as well.

Philadelphia was eighth in rank to qualify as a global city in the two-cluster method and was found in three individual-dimension clusters as global. However, it was reassigned by the three-cluster method from the global city list to partially global status along with Chicago, Boston, San Francisco, Washington, DC, and Miami. While Atlanta, Dallas and Houston are not included as global cities by the two-cluster method, they are identified by the three-cluster method as partially global cities. Each also was found as partially global in five of the seven cluster analyses for individual dimensions.

Table 3. Global city factor correlations with dimension variables, 53 US cities

<i>Dimension variables</i>	<i>Global city factor</i>
1 Urbanised area scale	0.88
2 Command centre factor	0.92
2a <i>Financial serv pay</i>	0.82
2b <i>Professional serv receipts</i>	0.96
2c <i>Info serv rec (adj.)</i>	0.68
3 Entertainment	0.87
4 Research crucible	0.72
5 Multiculturalism factor	0.78
5a <i>% foreign-born</i>	0.60
5b <i>Divs minority ownership</i>	0.82
6 Global gateways factor	0.85
6a <i>Seaport load-centre</i>	0.68
6b <i>Internl airport passenger</i>	0.86
7 Rail transit capacity	0.84

Notes: all correlations significant at 0.01 level or greater (two-tailed); the seven dimensions used in the global-city factor calculations are in bold.

Table 4. K-means cluster analysis: global city factor, 53 US cities (seven-variable factor)

<i>Cluster model</i>	<i>Cluster centres</i>			<i>Anova</i>	
	<i>Global city</i>	<i>Partially global city</i>	<i>Minimally global city</i>	<i>F-test</i>	<i>Significance</i>
Two-clusters	2.00	—	−0.36	136	0.000
Cities in cluster	8	—	45		
Three-clusters	3.42	1.25	−0.43	164	0.000
Cities in cluster	2	9	42		

Table 5. Global and partial global cities identified, 53 US cities: K-means cluster analysis

<i>CITY (urbanized area)</i>	<i>Two-cluster model^a</i>	<i>Three-cluster model^b</i>	
	<i>Global city</i>	<i>Global city</i>	<i>Partially global city</i>
New York	7	7	—
Los Angeles	6	6	—
Chicago	5	—	7
Boston	5	—	7
San Francisco/Oakland	4	—	5
Washington, DC	3	—	6
Miami	3	—	5
Philadelphia	3	—	5
Atlanta	—	—	5
Dallas/Fort Worth	—	—	5
Houston	—	—	5

^a Number of global city dimensions identified.

^b Number of global city and partially global city dimensions identified.

For the most part, the difference between these partially global cities and the global cities of New York and Los Angeles is explained by specialisation. All cities including global ones have attributes that give them unique distinction, but partially global cities do not measure their uniqueness evenly across all dimensions. For example, the data show that Boston and Washington, DC, stand out as specialists in the command centre function and as crucibles of research, and have world-class infrastructures that include transit and a global gateway (airport only for DC). By comparison, Philadelphia provides exceptional global city support systems (especially transit) but is not distinguished in

global platform functions (command centre, entertainment and research).

The San Francisco/Oakland area specialises in command centre functions and has a strong multicultural ‘*weltstadt*’ consistent with ‘uneven globalisation’ having an Asian emphasis. It also has a well-known rail transit system, global gateway airport (San Francisco) and containerised load-centre seaport (Oakland). Miami specialises as a global gateway and maintains a strong ‘*weltstadt*’ skewed towards its Caribbean and Latin American ties, but is not distinguished by platform functions. Dallas specialises in the command centre function, while Houston specialises as a global gateway. Atlanta is

known mostly for its international airport. Chicago is the only partially global city anomaly. It is the highest-ranking city overall in this category but exhibits no particular specialisation (perhaps reflecting Chicago's current multithrust work-in-progress to advance its global city status).

Finally, the study sought to compare the factor results of the global city construct with that of single-perspective research having a large-*n* empirical sample. Such a cross-study comparison would be especially significant in judging empirical commensurability and convergence if it included results of command centre research, the dominant single-dimension perspective in the global cities literature. Specifically, the comparison was made with a 'world city network' study ranking 123 cities world-wide according to command centre criteria (Taylor and Lang, 2005). Measured by the interurban distribution of 'global advanced service firms', it ranked cities according to their global economic connectedness and resultant relational power.

For comparison, 37 American cities in the Taylor and Lang study had overlap with this study's sample of 53. The match allowed for direct empirical correlation of the single-dimension index of their work with the multidimensional factor of this study. Even though differences in variable definition between the two studies existed, the comparison found a bivariate correlation of 0.93 (significance = 0.000). This result not only indicates the compatibility of a broader urban context with the command centre's focus on external relations, but also suggests the feasibility of interdisciplinary cross-over research between other single perspectives and a holistic complex-systems construct.

Discussion

Questions about three theoretical and methodological issues were posed at the beginning

of the article. What is a global city? Are its defining dimensions equally critical? Is the multiple-perspectives concept capable of showing construct validity and empirical significance? Offering some foundation to the claim that global cities are distinctive, the empirical results seem to confirm the feasibility of producing an empirically valid construct that integrates a range of dimensions representing disparate perspectives in the comparative study of cities in their global context.

In response to the first issue, the results seem to support a potential convergence of perspectives on the empirical artefacts of a global city which differentiate it from other urban settings. The seven dimensions appear to be commensurable and supportive of a broader, more robust and internally consistent vision of the global city. In addition to the robust single factor achieved by the principal components analysis, all the variables representing the dimensions (except for urban spatial form which was subsequently excluded) are tightly coupled, having intercorrelations significant at the 0.01 level or better. If viewed in accord with the three partially overlapping transformational stages of globalisation, the multiple-dimensioned global city resulted not from a single determinant (such as economic globalisation) but from direct and indirect paths of economic, sociological and political transformation forces in and outside the city.

One might have reason to expect, therefore, that disparity across existing global city research has the potential for being merged into a larger composite body of collective study. For example, given that the presence of one dimension is likely to predict the presence of the others, research done from one perspective (such as the sociology of urban entertainment) may have extended application or derivative implications for that done in another tradition (such as the

political economy of global command-and-control). The city in the world and the world in the city are commensurable.

One caveat to this conclusion is that the seven dimensions of urban globalness were conceived and constructed only in the context of cities in the US and therefore the construct and its cluster applicability may not be generalised to cities world-wide. Since globalisation began with a geocentric focus on America, part of the research strategy to limit scope was deliberate in the sense that its focus was on globalness in an American context. However, part of it also was practical in the sense of data availability and comparability. With a few exceptions (such as the Fiscal Austerity and Urban Innovation databank), most urban data across nation-states are either not collected according to a uniform convention or their quality has only limited verifiability. In what Short *et al.* (1996) referred to as “the dirty little secret”, this problem remains to the present.

In response to the second issue on equal value, the seven dimensions appear to support a highly integrated construct, but probably do not all weigh equally. While the single global city factor incorporates 70 per cent of the dimensions’ combined variance, the dimensions’ individual correlations with the factor varied. The factor appears to be more representative of the global command centre dimension ($r = 0.92$) than it is for the scale dimension ($r = 0.88$), the entertainment dimension ($r = 0.87$) and the others (ranging from $r = 0.85$ to 0.72). Whether these differences in correlation levels are sufficient enough to conclude that the dimensions are unequal enough to matter in defining the global city is open to discussion. At the very least, though, it would seem to draw into question the argument that there is one right way to understand the global city.

In light of the construct’s derivation from the three-stage transformations of globalisation,

some questions remain about inclusiveness. Perhaps the largest has to do with whether essential dimensions remain as yet unidentified. Some, like the relative presence of a manufacturing infrastructure and urban spatial form, were examined in this research and ultimately excluded because the first has been shown to be theoretically indefensible or inconsistent with globalisation (Sassen, 2001; Hymer, 1971) and the other was found in this study to be statistically unrelated. Socioeconomic polarisation also was examined and excluded because it suffers from significant conceptual ambiguity (Hamnett, 1994) and is argued to be a consequence of the global city rather than a defining dimension (Timberlake, 2006). In addition, Timberlake found in a preliminary study of 100 US cities that, even though the term elicits a set of complex relationships, there was very little statistical “support for the global cities/polarisation thesis” (Timberlake, 2006, p. 11).

In response to the third issue about conceptual clarity, the results strongly support the multidimensional construct by attributing a high level of construct validity to it. Specifically, Anova for the cluster analyses of both the two-cluster and three-cluster models show extremely high F-tests and significance, indicating that the data appear to conform to highly discernible boundaries between the clusters. Although Anova for cluster analysis can be misleading, these levels of significance provide some confidence that the observed distinctions are real. Reinforcing this conclusion, a comparison of cluster results for both the factor and the individual dimensions shows high consistency of inclusion of cities according to the global and partially global categories. In addition, those urbanised areas determined to be minimally global by the factor rarely showed up in a global or partially global cluster using the individual dimensions.

Implications

For a long time, research on global cities has stumbled over an inability to demonstrate clear conceptual and empirical distinctions about what constitutes a global city. As Taylor noted

One clear effect of the evidential crisis has been the failure for there to emerge any agreement on just which cities are world or global cities and which fail to qualify ... Thus, there is no way to define a 'cut-off point' to identify which cities do not qualify for inclusion (Taylor, 2004, p. 39).

This study answers this assertion with a method that does allow for multidimensional cut-off points using K-means cluster analysis and provides optimism about the potential of theory-driven empirical analysis for diminishing the longstanding controversy on the nature of global cities.

Yet, the multiple-perspectives construct potentially addresses another methodological problem of even greater proportions in metropolitan studies. The urban field inherently crosses many social science (and increasingly scientific) disciplines even though little attempt at collating the research is evident. In what may be called a 'silo effect', global city research has been carried out within segregated paradigms of scholarly traditions which remain largely uninformed by each other's work. The global cities construct offers a common ground that encourages comparative research across perspectives and enables complementary understanding of the origins and prospects of different urban global strategies.

Without such an approach, the field remains mostly dominated by a single isolated literature which probably attributes too much significance to globalisation as the primary antecedent in the emergence of global cities, and too little to historical circumstances and the role of internal policy initiatives to global

pressures. Indeed, the principal focus for many (see, for example, Beauregard, 1995) has been on how internal processes and outcomes are determined by globalisation rather than on seeing internal factors as co-determinants of global-cityness.

If external global forces were primarily what mattered, then we should expect the seven dimensions to reveal an unremitting sameness pervading the global cities slate. Although this study indicates that global (and partially global) cities share several core attributes, the dimensions data also show variation among them in how they function as strategic global platforms and in their physical and social appearance. The common dimensions do not make for sameness because public and private policy-making within each city provides the required internal response to implement the critical dimensions in unique ways and in different proportions over time (see, for example, Clark, 2004b; Hodos, 2002; Abu-Lughod, 1999). Cities have histories which "lead people to ask how we are different ... and how and why we can preserve what is distinctive, local, and authentic" (Clark, 2004b, p. 4). Differences in the mix of global 'specialisation' and developmental emphases among global cities strongly suggest that a city's response to global pressures matters but consists of unique combinations of differentiation and imitation.

This clearly calls for more than a global economy as the principal independent variable. To the extent that a prospective city may need high-level multidimensional connectivity to globalisation, the complex processes of achieving or sustaining global city status and its strategic platform probably require several agents within the urban area. Some scholars (for example, Boschken, 2003; Savitch and Kantor, 2002; Florida, 2001; Abu-Lughod, 1999) argue that these may include a cosmopolitan class structure and culture, and large amounts of interorganisational co-operation, public entrepreneurship and

civic creativity. However, without a multi-dimensional construct of the global city, such determinants cannot be empirically evaluated in a complex systems context and remain only vaguely understood.

Norgaard and Baer (2005) suggest that complex systems analysis requires multiple perspectives brought together by interdisciplinary research teams. The global city construct is a tool allowing this collectivisation to occur. For example, having the means empirically to distinguish global cities as complex systems enables a comparison that asks not only why and how global cities become so in a multidimensional sense, but also about why and what happens to urban places that do not progress towards global city status. Of considerable interest to urban politicians, cities may grow in global status, they may decline and they may rise or fall in rank (Friedmann, 1995; Sassen, 1994). As the global distribution of power and prestige “grows increasingly unequal” among cities (Alderson and Beckfield, 2007, p. 27), such slippage holds big stakes in multiple ways—economically, sociologically and politically.

In the search for antecedents of urban globalness, Sassen argues that “the more globalized the economy becomes, the higher the agglomeration of central functions in a relatively few sites, that is, global cities” (Sassen, 2001, p. 5). In light of the multidimensional construct, her thesis could only partly account for what makes a global city. Although it may speak to the command centre dimension, it does not convincingly address the other six dimensions or why some cities are global (or partially global) while others are categorically not. What internal urban forces and dynamics may be contributing to these differential outcomes? It seems unlikely that a global city’s multidimensional profile would be the result of market processes and corporate behaviour in the production service sector alone.

The global city construct provides a collective basis for examining how global cities

compare with less global counterparts in two other areas as well. In the first, cities affect the prospects of those living within their confines but the distribution of benefits and costs may be very different for global cities. For example, global cities appear to cause residential relocation. Some accounts suggest that professionals whose employment and leisure interests are connected to globalisation are repopulating redeveloped urban cores, causing a deconcentration of the urban poor and their migration to the periphery where housing costs are cheaper. The effect of such relocation on the poor includes decreasing their access to public services, diluting their community identity and increasing their commuting costs. It also may substantially raise the cost of public services and/or reduce the effectiveness of their delivery to persons in need.

In the second area, a global city seems to influence the nature and magnitude of urban development in both its surrounding region and beyond by setting examples or standards of ‘world-class’ status resulting from its global connectivity. Eager to exhibit benchmarks of their own status-centrality in the new world order, many minimally global cities have sought a short cut by mimicking the more physically evident attributes of global (and partially global) cities. For example, many American cities have invested heavily in high-density urban development in recent years, often approaching the size of ‘mega-projects’ (Altshuler and Luberoff, 2003) and giving the appearance of a post-modern global city. The outcomes, however, are likely to include minimal use and fiscal drag on the local population (especially when bankruptcy occurs).

Renewal and development are essential to urban vitality, but the nature, scale and type of development in some cities raise serious questions about motive and naivety. Does the overshadowing status of global cities encourage minimally global cities to mortgage

their futures on development that mimics what global cities have done to meet real global connectivity? Are such strategies in minimally global cities the result of global (or even regional) forces or are they the result of local policy-makers (public and private) pursuing phantom civic hopes by creating 'fake' cities that only nominally appear global? What are the global sources of socioeconomic and political demands for projects such as massive new rail transit systems, expanded 'international' airports, downtown high-rise office and residential complexes, and giant conference/sports stadium complexes? Applying the global city construct, does comparative evidence support similar demand profiles for global and minimally global cities alike? These are all probing questions that now may be empirically evaluated in the context of complex systems using a multiple-perspectives construct.

Acknowledgements

Special appreciation is expressed to Terry Clark (Chicago), Neil Brenner (NYU), Jason Beckfield (Cambridge), Steve Erie (U.C., San Diego) and this journal's three anonymous reviewers for their insightful comments and suggestions made on earlier drafts of this paper.

References

- Abrahamson, M. (2004) *Global Cities*. New York: Oxford University Press.
- Abu-Lughod, J. L. (1999) *New York, Chicago, Los Angeles: America's Global Cities*. Minneapolis, MN: University of Minnesota Press.
- Alderson, A. S. and Beckfield, J. (2004) Power and position in the world city system, *American Journal of Sociology*, 109, pp. 811–851.
- Alderson, A. S. and Beckfield, J. (2007) Globalization and the world city system, in: P. Taylor, B. Derudder, P. Saey and F. Witlox (Eds) *Cities in Globalisation*, pp. 21–36. London: Routledge.
- Altshuler, A. and Luberoft, D. (2003) *Mega-projects: The Changing Politics of Urban Public Investment*. Washington, DC: Brookings Institution Press.
- Beauregard, R. A. (1995) Theorizing the global-city connection, in: P. L. Knox and P. J. Taylor (Eds) *World Cities in a World-system*, pp. 232–248. Cambridge: Cambridge University Press.
- Beaverstock, J. V. (2004) Managing across borders: knowledge management and expatriation in professional service legal firms, *Journal of Economic Geography*, 4(2), pp. 157–179.
- Beaverstock, J. V., Taylor, P. J. and Smith, R. G. (1999) A roster of world cities, *Cities*, 16, pp. 445–458.
- Bishop, B. (2000) The changing face of American politics, *Austin 360 News* (www.austin360.com/statesman/editions/today/news_4.html).
- Boschken, H. L. (1988) *Strategic Design and Organizational Change: Pacific Coast Seaports in Transition*. Tuscaloosa, AL: University of Alabama Press.
- Boschken, H. L. (1998) Global shift in container traffic, *Public Works Management and Policy*, 2, pp. 368–372.
- Boschken, H. L. (2002) *Social Class, Politics and Urban Markets: The Makings of Bias in Policy Outcomes*. Stanford, CA: Stanford University Press.
- Boschken, H. L. (2003) Global cities, systemic power and upper-middle-class influence, *Urban Affairs Review*, 38, pp. 808–830.
- Brint, S. (2001) Professionals and the 'knowledge economy': rethinking the theory of postindustrial society, *Current Sociology*, 49(4), pp. 101–132.
- Castells, M. (1989) *The Informational City*. Cambridge, MA: Basil Blackwell.
- Castells, M. (1996) *The Rise of the Network Society*. Oxford: Blackwell.
- Clark, T. N. (2001) *Amenities drive urban growth*. Paper presented at the *Annual Meeting of the American Political Science Association*, San Francisco, August.
- Clark, T. N. (2002) *Urban amenities, migration, and entertainment*. An email exchange with the FAUI network (listserv.nd.edu; 4 May).
- Clark, T. N. (Ed.) (2004a) *The City as an Entertainment Machine*. New York: JAI Press/Elsevier.
- Clark, T. N. (2004b) *The new Chicago: not New York or LA, and why it matters for urban social science*. Paper presented at the *Annual Meeting*

- of the American Political Science Association, Chicago, September.
- Clark, T. N. and Hoffmann-Martinot, V. (1998) *The New Political Culture*. Boulder, CO: Westview Press.
- Clark, T. N. and Rempel, M. (Eds) (1997) *Citizen Politics in Post-Industrial Societies*. Boulder, CO: Westview Press.
- Coates, D. and Humphreys, B. R. (1999) The growth effects of sports franchises, stadia, and arenas, *Journal of Policy Analysis and Management*, 18, pp. 601–624.
- Connell, J. (Ed.) (2000) *Sydney: The Emergence of a World City*. Melbourne: Oxford University Press.
- Danielson, M. N. and Doig, J. W. (1982) *New York: The Politics of Urban Regional Development*. Berkeley, CA: University of California Press.
- Derudder, B. (2006) On conceptual confusion in empirical analysis of a transnational urban network, *Urban Studies*, 43(11), pp. 2027–2046.
- Derudder, B., Taylor, P. J., Witlox, F. and Catalano, G. (2003) Hierarchical tendencies and regional patterns in the world city network: a global urban analysis of 234 cities, *Regional Studies*, 37, pp. 875–886.
- Derudder, B. and Witlox, F. (2005) An appraisal of the use of airline data in assessments of the world city network, *Urban Studies*, 42(13), pp. 2371–2388.
- Eakin, E. (2002) *Creative cities and their new elite*. A book review reproduced by Terry Clark on the Internet (FAUINET@listserv.nd.edu; 3 June).
- Erie, S. (2004) *Globalizing L.A.* Stanford, CA: Stanford University Press.
- Federal Transit Administration (2000) *2000 National Transit Database: Table 20, National transit summaries and trends*. US Department of Transportation, Washington, DC.
- Florida, R. (2001) *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*. New York: Basic Books.
- Frank, A. G. (1998) *ReOrient: Global Economy in the Global Age*. Berkeley, CA: University of California Press.
- Friedman, T. L. (2000) *The Lexus and the Olive Tree*. New York: Anchor Books.
- Friedmann, J. (1986) The world city hypothesis, *Development and Change*, 17, pp. 69–83.
- Friedmann, J. (1995) Where we stand: a decade of world city research, in: Paul L. Knox and Peter J. Taylor (Eds) *World Cities in a World-system*, pp. 21–47. Cambridge: Cambridge University Press.
- Friedmann, J. and Wolff, G. (1982) World city formation: an agenda for research and action, *International Journal of Urban and Regional Research*, 6, pp. 309–344.
- Hall, P. (1966) *The World Cities*. London: Heinemann.
- Hamnett, C. (1994) Social polarization in global cities: theory and evidence, *Urban Studies*, 31(3), pp. 401–424.
- Hawes, D. (2000) Interpreting the new political culture, *Policy & Politics*, 28, pp. 263–268.
- Heldman, R. K. (1992) *Global Telecom-munications*. New York: McGraw-Hill.
- Hodos, J. I. (2002) Globalization, regionalism and urban restructuring: the case of Philadelphia, *Urban Affairs Review*, 37, pp. 358–379.
- Hymer, S. (1971) The multinational corporation and the law of uneven development, in: J. W. Bhagwati (Ed.) *Economics and World Order*, pp. 113–140. New York: Macmillan.
- Jones, D. (1985) *Urban Transit Policy: An Economic and Political History*. Englewood Cliffs, NJ: Prentice-Hall.
- Keeling, D. J. (1995) Transport and the world city paradigm, in: P. L. Knox and P. J. Taylor (Eds) *World Cities in a World-system*, pp. 115–131. New York: Cambridge University Press.
- Kerr, C. (1963) *The Uses of the University*. Cambridge, MA: Harvard University Press.
- Knox, P. L. and Taylor, P. J. (Eds) (1995) *World Cities in a World-system*. Cambridge: Cambridge University Press.
- Lang, R. E. (2003) *Edgeless Cities: Exploring the Elusive Metropolis*. Washington, DC: Brookings Institution Press.
- Markusen, A. and King, D. (2003) *The Artistic Dividend: The Arts' Hidden Contribution to Regional Development*. Minneapolis, MN: Humphrey Institute of Public Affairs.
- Matsumoto, H. (2004) International urban systems and air passenger and cargo flows: some calculations, *Journal of Air Transport Management*, 10, pp. 241–249.

- McKenzie, E. (2001) *Is the new political culture only middle class?* Column in the Chicago Journal reproduced on the Internet (FAUINET@listserv.nd.edu; 3 December).
- Nelson, A. C. (2001) Prosperity or blight? A question of major league stadia locations, *Economic Development Quarterly*, 15, pp. 255–265.
- Noam, E. (1992) *Telecommunications in Europe*. Oxford: Oxford University Press.
- Norgaard, R. B. and Baer, P. (2005) Collectively seeing complex systems: the nature of the problem, *BioScience*, 55(11), pp. 953–960.
- Nyman, J. (1996) Breaking the rules: Miami in the urban hierarchy, *Urban Geography*, 17, pp. 5–22.
- Park, R. E. and Burgess, E. W. (1967) *The City: Suggestions for the Investigation of Human Behavior in the Urban Environment*. Chicago, IL: University of Chicago Press.
- Perkins, S. J. (1997) *Internationalization: The People Business*. London: Kogan Page.
- Porter, M. (1998) Clusters and the new economics of competition, *Harvard Business Review*, November/December, pp. 77–90.
- Rath, J. (2002) *Immigrants and the tourist industry: the commodification of cultural resources*. Paper presented at the 15th World Congress of Sociology, Brisbane, Australia, July.
- Reich, R. B. (1992) *The Work of Nations*. New York: Vintage Books.
- Rimmer, P. (1998) Transport and telecommunications between world cities, in: F. C. Lo and Y. M. Yeung (Eds) *Globalization of the World of Large Cities*, pp. 433–470. Tokyo: United Nations University Press.
- Sassen, S. (1994) *Cities in a World Economy*. Thousand Oaks, CA: Pine Forge Press.
- Sassen, S. (1998) *Globalization and Its Discontents*. New York: The New Press.
- Sassen, S. (2001) *The Global City*. Princeton, NJ: Princeton University Press.
- Sassen, S. (2004) *The repositioning of citizenship: toward new types of subjects and spaces of politics*. Paper presented at the Conference on Transforming Citizenship? Transnational Membership, Participation and Governance, Campbell Public Policy Institute, Maxwell School of Syracuse University, April.
- Savitch, H. V. and Kantor, P. (2002) *Cities in the International Marketplace*. Princeton, NJ: Princeton University Press.
- Sellers, J. M. (2001) *Governing from Below: Urban Regions and the Global Economy*. Cambridge: Cambridge University Press.
- Short, J. R., Kim, Y. and Wells, H. (1996) The dirty little secret of world cities research: data problems in comparative analysis, *International Journal of Regional and Urban Research*, 20, pp. 697–717.
- Smith, D. A. and Timberlake, M. F. (1995) Conceptualising and mapping the structure of the world system's city system, *Urban Studies*, 32, pp. 287–302.
- Smith, D. A. and Timberlake, M. F. (2001) World city networks and hierarchies, 1977–1997, *American Behavioral Scientist*, 44, pp. 1656–1678.
- Smith, D. A. and White, D. R. (1992) Structure and dynamics of the global economy: network analysis of international trade, *Social Forces*, 70, pp. 857–893.
- Smith, M. P. (2001) *Transnational Urbanism*. Oxford: Blackwell.
- Soja, E. W. (2000) *Postmetropolis*. Oxford: Blackwell.
- Tajbakhsh, K. (2001) *The Promise of the City: Space, Identity and Politics in Contemporary Thought*. Berkeley, CA: University of California Press.
- Taylor, P. J. (2004) *World City Network: A Global Urban Analysis*. London: Routledge.
- Taylor, P. J. and Lang, R. E. (2005) *U.S. cities in the 'world city network'*. Survey Series, Metropolitan Policy Program, The Brookings Institution, Washington, DC. February.
- Thrift, N. (1994) Globalisation, regulation, urbanisation: the case of the Netherlands, *Urban Studies*, 31(3), pp. 365–381.
- Timberlake, M. F. (2006) *A global city hypothesis: an empirical assessment among U.S. cities, 1990–2000*. Paper presented at the World Congress of the International Sociological Association, Durban, South Africa, July.
- US Army Corps of Engineers (2000) *Waterborne commerce of the United States: Part 5 national summaries*. Waterborne Commerce Statistics Center, New Orleans, LA.
- US Bureau of the Census (1997) *Economic census of the US*. US Department of Commerce, Washington, DC.
- US Bureau of the Census (2002) *Census of the population, Summary File 3A*. US Department of Commerce, Washington, DC.

- US Department of Transportation, Bureau of Transportation Statistics (2001) *Airport activity statistics of certified air carriers: summary tables for 2000*. Bureau of Transportation Statistics, Washington, DC (www.bts.gov/publications/airactstats2000/).
- Walks, R. (2001) The social ecology of the post-Fordist/global city: economic restructuring and socio-spatial polarisation in the Toronto urban region, *Urban Studies*, 38, pp. 407–447.