Neighborhood Diversity and the Rise of Artist Hotspots: Exploring the Creative Class Thesis through a Neighborhood Change Lens

Corina Graif, PhD[*]
Department of Sociology and Criminology, Pennsylvania State University

> The city has "historically been […] a most favorable breeding ground of new biological and cultural hybrids. It has not only tolerated but rewarded individual differences. It has brought together people from the ends of the earth because they are different and thus useful to one another, rather than because they are homogenous and like-minded"
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> (Wirth, 1938).

The multi-ethnic and multi-racial immigration waves after 1965 have uniquely reshaped the urban scene in the US[1] (Kasinitz, Mollenkopf, and Waters 2002; Fong and Shibuya 2005). In 2014, the minority groups' share of the population was 38 percent and children younger than five years of age became for the first time a majority-minority (U.S. Census Bureau 2015). In cities of population sizes over 250,000, minority groups already are the majority (Lee, Iceland, and Sharp 2012). These dramatic changes have prompted scholars to call for more research on the effects of diversity in changing the social, economic, and institutional fabric of urban neighborhoods. Studies have traditionally highlighted potential drawbacks of diversity, such as social disorganization and culture clashes (Shaw and McKay 1942; Smelser and Alexander 1999), distrust, or violence (Huntington 2004; Putnam 2007). However, avoiding diversity has translated into strong residential segregation patterns, with their own negative implications for cities and neighborhoods (Massey and Denton 1988).

More recently, evidence increasingly suggests that in urban settings, diversity operates as an amenity rather than a liability (Florida 2002) -- reducing prejudice and increasing tolerance (Wilson 1985), preventing conflicts (Varshney 2002) and violence (Martinez and Lee 2000; Graif and Sampson 2009) and leaving organizational involvement unencumbered (Sampson and Graif 2009; Tran, Graif, Jones et al. 2013). Population diversity has been shown to be positively associated with American-born workers' employment and wages at the city level (Ottaviano and Perri 2005). Diversity was also underscored as key in shaping the urban mode of life by Chicago School scholars (Park 1915;Wirth 1938). Wirth's concerns that urbanism may heighten feelings of alienation were mitigated by his view that anonymity encourages cultural innovation by fostering a sense of freedom from groups or norms. Other notable writings on urban development offer illustrations of how cities thrive on the variety

[*]Contact information: Corina Graif, Department of Sociology and Criminology, Pennsylvania State University; 603 Oswald Tower, University Park, Pennsylvania, 16802; phone: 814-863-7712; corina.graif@psu.edu.
[1]Mainly from Latin America, the Caribbean, Asia, the Middle East, and Africa.

of people, skills, goods, and services (Jacobs 1961; Fischer 1975). The movement back to the city of artists and other professionals into working-class neighborhoods between the late 1950s and the 1970s has often been attributed to these groups' espousal of the city's opportunities for diverse cultural experiences, yet few studies have examined such patterns at the neighborhood level (Zukin 1998). Understanding what shapes the success of many diverse neighborhoods may help us improve the odds of less successful ones.

This study proposes that neighborhood diversity may operate as an engine of economic, social, and institutional growth by stimulating a culturally creative environment that attracts artists and art-related organizations. It draws on classic and modern foundations of sociological thinking and relates them to a recent, influential thesis on the creative class, by urban economist Richard Florida (2002). Examining data from over 800 neighborhoods in Chicago, it focuses on the role of neighborhood diversity in shaping the spatial distribution of the artists and art nonprofit organizations over time.

Better understanding artists' and art organizations' location patterns may present important clues into the processes that shape neighborhood spatial inequality (Patterson and Silver 2015). In 1975, Claude Fischer proposed that urbanism and diversity contribute through subcultural processes to increasing the concentration of a wide range of unconventional groups—from criminals to artists (also Park 1915, p. 41). Acknowledging the body of work on criminal unconventionality, twenty years later he re-emphasized the need for more research on the urban rise of "non-descent based subcultures, such as those focused around professions (e.g. medicine), lifestyles (e.g. bohemians), pastimes and avocations (e.g. the arts), exceptional traits (e.g. the blind), and so on. […] The idea that large cities nurture various forms of avant-garde culture -- innovative art, music, sexual, and political social worlds, for example – seems part of the common wisdom, but there is little systematic evidence on the point" (Fischer 1995, p. 559, 565).

The current article addresses this gap by examining how urban diversity predicts the local presence of artists and art organizations at the neighborhood level. Urban artists and art organizations are important for economic and non - economic reasons (Markusen and Schrock 2006; Markusen 2014). A national report (2006) estimates that the nonprofit arts and culture in Chicago supports over 30,000 full time jobs, spends annually over 600 million dollars, and generates additional hundreds of million dollars in spending by audiences and over $100 million in local and state government revenue (p. 8, 11). Recent studies indicate that artist and art organizations presence decrease disadvantage levels (Foster, Grodach, and Murdoch 2016) and benefit neighborhoods in multiple other ways (Grodach 2011; Kay 2000; Stern and Seifert 2008; Woronkowicz, 2015). For instance, studies like Grams and Warr's (2003) in Chicago and Grodach's (2011) in Dallas-Fort Worth found that small budget art activities attract local and non-local costumers to local businesses; create new uses for underutilized spaces and facilities; help local organizations mobilize resources; and create links to non-local resources by bringing together artists, local residents, and non-local consumers. A large share of participants and consumers can come from outside the neighborhood (Stern and Seifert 1998). Consistent with this point, Americans for the Arts (2006) found that close to half of the millions of attendees to Chicago's nonprofit arts events

in 2006 were from a different county than the event location and spent more per person than local attendees.

Beyond the inflow of extra-local money and other economic benefits, the local social, cultural, and environmental benefits of local art activity are equally important. Studies (Grams and Warr 2003; Grodach 2011; Stern and Seifert 2008) of neighborhoods in different cities find that local art activities help build local social networks within and across neighborhoods and groups and foster civic participation and dialogue. For local youth, they offer opportunities for mentorship and educational resources such as technological, leadership, entrepreneurial training, and access to equipment, computers, and facilities. Art activities are particularly important in diverse neighborhoods as they help facilitate the expression of cultural identities for minorities while at the same time offering a safe space for inter-group dialogue, collaboration, information and resource sharing. As a consequence, art is viewed by local artists and residents as a "community building activity" and "an empowering tool" (Grams and Warr 2003, p.16, 31). Indeed, disadvantaged neighborhoods that exhibited a higher numbers of cultural providers and participants were found to be three to four times more likely to revitalize and to improve their housing markets compared to other disadvantaged neighborhoods (Stern and Seinfert 2008).

FLORIDA'S CREATIVE CLASS THESIS AND THE CURRENT STUDY

An influential thesis proposed by Richard Florida in his *Rise of the Creative Class* book in 2002 suggests that people in "creative class" occupations, such as artists, scientists, engineers, educators, lawyers, managers, and other professionals tend to reside in diverse rather than homogenous regions and cities. Diversity is a desirable characteristic for these individuals because they value a potentially tolerant and open-minded environment in which meritocracy prevails and which thrives on unconventional tastes and life-styles. Building on Jacobs (1961), Florida argues that diverse cities nourish a vibrant street life and cosmopolitan amenities. This increases the perceived quality, or the "character" of the place, which attracts creatives beyond the availability of jobs. Diversity, gay communities, and "bohemian" clusters all serve as producers and markers of an area's character and distinctive amenities. Where "creatives" live is important because they stimulate the urban economy and are followed by highly skilled individuals and better-paid jobs.

The creative class thesis has been given great attention in the public policy arena[2] and prompted heated criticisms (e.g., Baris 2003; Milligan 2003; Peck 2005; Glaeser 2005; Markusen 2006) and academic debates on diversity and urban growth (Noonan 2013; Peck 2005). The current study builds on the essence of the creative class and begins to address several of the key criticisms, by changing the analytical unit and bringing in ideas from classic and modern scholarship on urbanism, migration, "character of the place," and neighborhood growth (e.g., Suttles 1984; Zukin 1987; Molotch et al. 2000).

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[2]For instance, Governor Granholm of Michigan founded a *Cool Cities* initiative in 2003 to "attract urban pioneers and young knowledge workers who are a driving force for economic development and growth," and to build and reinvest in "neighborhoods that offer a sense of place" (Michigan Department of Labor and Economic Growth 2005, p.3). She invited mayors from 274 cities to participate in a Local Cool City Advisory Group. Similarly, in 2006, Mayor John Hickenlooper of Denver founded a *Task Force* to "preserve, expand, foster, and develop creative spaces" (Denver Office of Cultural Affairs 2006, p. 15).

First, the creative class thesis focuses on the city as the unit of analysis and the empirical evidence on this topic has relied mostly on cross-regions, county, or city analyses (e.g., Florida 2002; Wojan, Lambert, and McGranahan 2007; Florida, Mellander, and Stolarick 2008). Yet, *within* these broad areas, local diversity may function as a deterrent if artists spatially cluster in city center *neighborhoods* (Menger 1999; Markusen 2006) *that* are less diverse than the larger region. Still, valuable urban ethnographies (e.g., Mele 2000; Lloyd 2006) have suggested that in certain neighborhoods, diversity attracts creatives . Yet few systematic analyses exist on this across neighborhoods. This article bridges this gap. To expand Florida's thesis from regional and city level processes to the local level , the current study brings in ideas from classic works on urban processes, as proposed by Fischer (1975) in his subcultural theory of urbanism and by scholars of diversity, mobility, and neighborhood change (e.g., Blau 1977; Kasinitz et al. 2008; Park, Burges, and McKenzie 1925; Wirth 1938). The current analysis does not seek to measure directly concepts like place character and authenticity, which can be subjective and hard to measure, but instead draws on them to inform expectations about how local diversity may generate new creative capacities and neighborhood growth. Moreover, rather than test Florida's thesis in its broad formulation, the current analyses engage with it as a jumping off point and explore the extent to which the creative class insights operate at a more local geographic level .

Second, critics argue that the creative class is defined too broadly (Markusen 2006). For instance, studies suggest that, in contrast to artists, scientists and other professionals prefer suburban and exurban areas, which tend to be less heterogeneous (Markusen et al. 1991). Compared to other creative class subgroups, Markusen argues that artists have stronger preferences for diversity, higher tolerance for dangerous neighborhoods, and a different impact on urban neighborhoods. By taking up residence in the disadvantaged areas of a city and engaging in the collective life of the community, "bohemians" emerge as the *pioneers of the "urban frontier,"* opening the pathway into the neighborhood for *later waves* of talented and skilled residents (Suttles 1984; Zukin 1987). Artists are younger than the rest of the workforce, often self-employed, or under temporary contracts, and working on multiple projects at once, situations which enable to them to move more freely than other "creatives." The diversity and potential hybridity of street level cultural elements has long been argued to impact the spatial concentrations of artists (Fischer 1975), who often draw on local resources and the social and built environment in producing and presenting their craft. In her research on artists' migration to cities like Minneapolis-St. Paul, Markusen (2006) notes that artists report a sense of responsibility to use their talent to improve the neighborhood, which they translate into concrete action such as devoting theaters and art galleries to local minorities or groups. Interactive art-making that includes the local audience in the production and performance likely attract artists more than other creatives to neighborhoods with a diverse pool of resources. For these reasons, this study focuses on artists and art organizations and on neighborhoods.

Third, empirical tests of Florida's thesis often measure the diversity and tolerance level of a place based on the gay index (2002), sometimes also adding the proportion of foreign-born residents. This approach is an important start. Researchers, however, point to the need to further explore other relevant elements of social differentiation (e.g., Markusen 2006, p. 1923)., including racial, ethnic, and immigration status, language group, country of birth,

ancestry, or exposure to mainstream American culture (Blau 1977; Portes and Truelove 1987; Alba 1992; Waters 2000). In response, the current study expands the measures of diversity further to explore how multidimensional aspects of diversity affect neighborhood-level dynamics (Okediji 2005). Included are multiple measures of diversity, based on language, racial and ethnic status, different places of origin and regions of birth, immigrants' duration of residence in the US, and ancestry groups.

SUBCULTURAL HYBRIDIZATION AND MULTI-DIMENSIONAL DIVERSITY

Claude Fischer (1995, p.545) acknowledges that groups' efforts to differentiate themselves from each other in a diverse urban setting may increase tensions and conflicts. However, he views these dynamics as likely short-lived. Initial tensions may be followed by more constructive interactions; as communication channels improve and tolerance of unconventionality increases, potential conflicts are mitigated and norms and behaviors diffuse from a subculture to another. Drawing on Park and Wirth, but moving the focus from the individual to the ecological level, Fischer proposed that places with higher population density and heterogeneity foster the "intensification" of unconventional subcultures as different as criminal groupings and artistic communities. In Fischer's words (1995, p. 544), a *subculture* is "a large set of people who share a defining trait, associate with one another, are members of institutions associated with their defining trait, adhere to a distinct set of values, share a set of cultural tools (Swidler 1986), and take part in a common way of life," and *heterogeneity* refers to social differentiation based on many possible criteria, from race, ethnicity, and sexual orientation, to occupation. Spatial proximity of different groups, Fischer adds, fosters over time inter-group imitation, diffusion of cultural elements, and hybridization (see also Blau 1977), leading to diverse forms of avant-garde culture and significant innovations in art, music, and science (Wirth 1938; Fischer 1975,1995 p. 545).

Variations in race, ethnicities, and languages spoken within neighborhoods may indicate important differences among individuals' cultural frames of reference as manifested in their traditions, values, norms, attitudes, and habits (Ottaviano and Perri 2005). While such differences may initially hinder communication between residents (Borjas 1994), over time, groups may learn to better communicate with each other and benefit from their different skills and cultural toolkits. Diversity by racial status and by national origin in groups has been empirically shown to foster cognitive outcomes, good ideas, and widen the range of perspectives (Miliken and Martins 1996). Members of diverse groups (including juries) have been shown to consider more information and process it more thoroughly and accurately (Apfelbaum, Philips, and Richeson 2014; Sommers 2006). Cities with higher proportions of immigrants exhibit lower black-white segregation (Iceland 2004), suggesting that immigrant groups may foster inter-group interactions that benefit other races as well. After decades of sustained population loss following industrial restructuring and increases in crime in the earlier decades, immigration accounted for most of Chicago's population growth in the 1990s and may have played a major over time in neighborhood stabilization, social organization, and crime reduction (Sampson 2012). Consistent with this idea, Graif and Sampson (2009) found that language diversity predicts decreasing homicide rates across Chicago neighborhoods. Diversity of immigrant generations (Alba and Nee 2003), may also benefit a neighborhood. As the classic assimilation theory (Gordon 1964) posits, with every

subsequent generation, immigrants assimilate into mainstream society deeper than the previous generation. Thus, diversity of generational status may help new immigrants' integration into the neighborhoods as well. Moreover, regional differentiations may also be relevant for neighborhood wellbeing, as studies focused on the distinctiveness of the Southern subculture suggest (Tuch 1987).

Above and beyond the effect of increased variation in individuals' attributes, Fischer (1995) argues, diversity fosters unconventionality, hybridization of ideas, and innovation. Increased likelihood of contact and interdependence due to spatial proximity allow the creation or modification of subcultures that are more tolerant of unconventionality[3]. Studies have shown that (Pettigrew & Tropp, 2008) inter-group contact reduces prejudice by decreasing inter-group tension and increasing empathy and perspective taking. Empirical work (e.g., Wilson 1985) focused on groups of non-dominant religious, political, racial, or sexual values supports this thesis. Homosexuality and tolerance for homosexuality are more often reported in large, and presumably more heterogeneous, places (Wilson 1985). A neighborhood climate where differences and innovation are welcomed is likely to be attractive to artists, who often live unconventional lifestyles (are often self-employed, work part time, or go through long unemployment periods), are residentially more mobile, prefer to get together in coffee shops and other settings, and sometimes perform or exhibit their art in public (Markusen 2014) .

Beyond job opportunities or economic restrictions shaping individuals' movement into or out of neighborhoods, Molotch, Freudenburg, and Paulsen (2000, p. 816) argue that "there is also a selective migration based on 'softer' criteria that demographers typically ignore. Within the powerful macro forces of migration, people self-select on place character and tradition"— what Suttles (1984, p. 234) calls "local collective representations" or "local urban culture". This may be because neighborhoods' cultural validation reflects on residents' collective identity and social credentials (Logan and Molotch 1987). Opportunities for diverse cultural experiences may influence artists to move to the city (Zukin 1998, p. 831) as "a negation of the historical separation […] of home and work; and a desire for 'authenticity,'" with neighborhood diversity often viewed as a key dimension of authentic character in a place.

For instance, in a case study of Chicago's Wicker Park, a community that by the 1990s had one of the largest concentrations of artists in the US, Lloyd (2006) finds that the diversity of the neighborhood is often viewed as a symbol of the "bohemian ethos", a signal of unconventionality, and a marker of place authenticity. Similarly, in a study of artists in New York's multi-ethnic/racial Lower East Side, Mele (2000) describes that residents embrace neighborhood diversity as a "symbolic appropriation of difference". The perception of the neighborhood as "marginal, exotic, and different suited the image and the identity of romantic artists as "frontier scouts" of culture, moving ahead of their contemporaries into uncharted territories where they would undergo privation and sacrifices… [T]he struggles between insiders (ethnic and racial working class) and outsiders (white, middle and upper

[3]Fischer (1982) offers evidence that urban residents have more tolerant attitudes toward unconventional behavior than residents of smaller places, controlling for measures such as educational level.

classes) became a *source* of inspiration and expression of a critique of the capitalist culture"
(p. 26). In sum, this body of work suggests that, if artist thrive on subcultural hybridization
and unconventionality, if they are attracted to live and work in diverse neighborhood
(whether due to a genuine search for inspiration, romantic rebellion, or simply,
commercially appealing symbolism), one would expect that, net of low rents and other
sociodemographic characteristics of a neighborhood:

> Neighborhood diversity in Chicago will be associated with higher later levels of,
> and increases over time in, the residential location of artists (hypothesis 1).

In contrast to Florida's focus on *individuals'* preferences and behavior, Fischer's theory is in
essence about *places* (1995, pp. 547-549) and "requires place-level analyses and ideally,
emergent, place-level measures. For instance, a subculture's intensity might be indicated by
the presence and nature of its local institutions, businesses, public displays, collective events,
and so forth" (Fischer 1995, p.548). Such measures contribute to what has been called "place
character". Highly dense and heterogeneous areas increase the chances that any individual
no matter how unconventional will find similar others, the theory suggests. As a group
reaches a critical mass, it becomes more able to reinforce its culture (also Suttles 1968) and
to sustain more subcultural institutions, which may serve as congregation centers and
promote in-group ties (Breton 1964). This process, called *institutional intensification,*
enables members to resist outside pressures and conflicts and to become more visible,
expressive, and assertive, as Olzak and West (1991) indicate in a study of ethnic newspapers.
Indeed, the evidence suggests that ethnically diverse states and metro areas have higher
concentrations of artists (Heilbrun 1996) and art organizations (Blau 1986). At the local
level, encounters with other subcultures in a diverse neighborhood may intensify self-
differentiation efforts, reinforcing group boundaries, and increasing in-group cohesion
(Simmel 1951), especially for unconventional subcultures like homosexuals or artists
(Fischer 1995, p. 545). Competition among groups for local resources, sponsors, and
consumers likely stimulates art innovation and further increase the institutional density of
the art scene. Indeed, research in New York City (Foster et al. 2016) found that moderate to
high racial diversity levels, more than lower levels, attracted the location of arts
organizations. In sum, this suggests that, net of other neighborhood characteristics,

> Neighborhood diversity in Chicago will be associated with higher later levels of,
> and increases over time in, the density of nonprofit art organizations (hypothesis 2).

DIVERSITY AND SOCIAL DISORGANIZATION

Theoretical and empirical work in the Chicago School tradition has long dealt with the
implications of immigration and heterogeneity for neighborhood development. Mostly
focused on delinquency and crime, the social disorganization arguments suggest that racial /
ethnic heterogeneity, together with its socioeconomic disadvantage and residential
instability, weaken a neighborhood's institutional base and bring about miscommunication
problems and inter-group tensions, which disrupt the normative structure and the levels of
formal and informal social control that could keep crime in check (Park et al. 1925, p. 107;
Shaw and McKay 1942). Building on these insights, more recent arguments suggest that as
immigrants search for affordable housing and move to poor neighborhoods, they may be

more likely to adapt to the local "underclass" norms of conduct, becoming alienated from both ethnic and mainstream cultures (Portes and Zhou 1993), and perhaps even joining gangs to protect themselves against local tensions (Martinez and Lee 2000). Other evidence links heterogeneity to weakened social control, mistrust, and culture clashes (Smelser and Alexander 1999; Putnam 2007), which would presumably deter residents and organizations from settling into diverse neighborhood, if they have other choices.

Because of low housing cost, socially disorganized places may attract both minority groups and artists, potentially confounding the direct relationship between diversity and artists. It is thus important to account for neighborhood socioeconomic status and housing rent costs in estimating the independent role of diversity. A study of Canadian communities shows some evidence that, net of socioeconomic status and other characteristics of an area, increasing shares of visible minorities over time predict declines in the presence of art organizations (Peterson and Silver 2015). Overall, in contrast with the prior hypotheses, this body of work suggests that, independent of low rents and other sociodemographic characteristics of a neighborhood,

> Neighborhood diversity in Chicago will be associated with lower later levels of, and decreases over time in, the local presence of artists and art organizations (hypothesis 3).

DATA

The current study aima to estimate the relationship between neighborhood diversity and the later concentration of artists and art organizations in a neighborhood. Neighborhoods are the unit of analysis of interest, measured as census tracts[4] -- geographic units of about 3,460 residents on average in Chicago. This was the smallest units for which all of the data relevant for the analyses were publicly available or obtained through a special tabulation. The use of census tracts to investigate ecological urban structures is in line with a long tradition in sociology. A review of neighborhood studies (Sampson, Morenoff, and Gannon-Rowley 2002) found that more than half of the studies used census tracts or tract aggregations to approximate neighborhoods. Moreover, tract level analyses yielded similar results to other neighborhood definitions. Tract boundaries tend to follow streets, rivers, or other natural limits. Still, they might not always overlap with the perceived or *in situ* enclosures of the community space[5]. The spatial methods presented below help to adjust for possible measurement error at the boundary or meaningful cross-boundary spillovers.

Chicago's rich tradition of research provides an important, comprehensive, and historically relevant context for these analyses. It is there that Park, Burgess, Wirth, Shaw, and McKay first addressed the implications of heterogeneity for neighborhoods. More recently, Lloyd's (2006) ethnographic study of Wicker Park's "bohemians" offers an in-depth perspective that uniquely motivates and complements the quantitative approach in this paper. Although ranked below cities that are traditionally identified as cultural centers, like San Francisco, Boston, or New York, Chicago is at the beginning of the 21st century among the top 20 large,

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[4]Moreover, because some Census data were estimated, tracts with less than 100 residents were excluded from the analysis.
[5]While less common, other definitions have been used, from neighborhood clusters to T-communities (Sampson et al. 2002).

creative cities in the United States (Florida 2002). Chicago is also considered a gateway city for immigrants, like Los Angeles, New York, Miami, San Francisco, Dallas, and Houston (Singer 2015; Waters and Jiménez 2005). Chicago is also among the most diverse, above Washington DC, Dallas, Atlanta, and Philadelphia (Ottaviano and Perri 2005).

The measures used in these analyses are in part built on 1990 and 2000 U.S. Decennial Census data, Summary Files 1 through 4, together with data from the Neighborhood Change Data Base (NCDB) (GeoLytics 2003)[6]. Due to differences in the census tract sizes and changes in boundary definitions over time, the 1990 data is normalized to match the 2000 boundaries. The occupational group data underlying the main version of the artist index are based on a special Census Bureau tabulation that was requested specifically for this study. The groups include actors, producers and directors, dancers and choreographers, musicians, singers and related workers, writers, and authors, photographers, designers, other artists and related workers (Table 1 for more details). For comparability with previous work, these codes were selected to match the occupations included by Florida (2002) in the "bohemians" group, the core of the creative class. The number of residents included in these occupation categories in 2000 across all the tracts is 23,280. The *artist concentration* index reflects the number of residents in artistic occupations per 100 residents in a census tract.

For comparability over time, an extended version of the artist index is created to include a wider range of occupations -- released at the tract level as a group in the 1990 Census SF3 and in the 2000 Census SF4 (see Table 1). The group includes actors, producers and directors, editors, dancers and choreographers, musicians and singers, artists and related workers, designers, entertainers, performers, athletes, coaches, writers and authors, news analysts, reporters, photographers, broadcast, sound, and radio operators, other media and communication workers. Athletes and coaches cannot be excluded from this group. Over 93% (800) of tracts have zero residents in the athletes and coaches group, twenty tracts have between one and four residents in this occupation group, and one tract has about forty. The correlation between the main artist index and the extended index is over .90. Still, whenever possible, analyses were repeated using both indices with the same substantive results.

The Census data likely undercount some artists, such as when they report non-art work as their primary job (Markusen and Jackson 2006; Markusen et al 2008). While imperfect, these data enable an analysis of a great share of artists' residential patterns across all neighborhoods in the city -- information that is typically very costly to collect through typical surveys. If artist have similar residential preferences, spatially cluster close to each other, or learn about housing vacancies from each other, capturing the residential location of some of them may also indicate the residence of some of the missing others. Still, future studies on artists' residential preferences by employment status and job type would be valuable.

To the Census based occupational measures of artists, organizational measures were added to explore complementary views of artist presence by accounting for the organizational

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[6]Some census tracts changed boundaries over time. The NCDB data is normalized to reflect consistent boundaries across time, using 2000 as the reference year. When the raw data were not normalized, I applied the normalization procedure myself.

location of artists and art support employees. Even if some employees of art organizations do not produce art directly, they may indicate the scale of the organizations' art activity. The measure of art organizations density was created based on a list of nonprofit art organizations provided by the Arts Scan project (Botts 2007) for 2006, which complemented IRS and Guidestar data with data from the Gaylord and Dorothy Donnelley Foundation records and from state and local directories and membership rosters. Organizations involved in art were classified based on the National Taxonomy of Exempt Entities (NTEE) codes and IRS principal activity codes (recoded to match the NTEE codes). See Appendix for more details. The organizational data were aggregated to yield a census tract count, from which an organizational density index was calculated as the natural logarithm of organizational concentration per 1000 residents[7]. Organizational measures have the advantage that they are based on different data than the census but are also limited as they do not capture self-employed artists. Still, a considerable overlap is observed between the location of artist and art organizations across Chicago's neighborhoods. Including both occupational and organizational measures of artist presence is valuable (Markusen et al., 2008) and offers an opportunity to observe potential differences or similarities in the role of diversity on artists' spatial clustering under different assumptions and definitions, both narrow and broad.

Diversity Measures

Ethnic and Racial Diversity is calculated as a Herfindahl concentration index (Blau 1977; Massey and Denton 1988), equal to one, minus the sum of squares of the proportions of the neighborhood population made up by each racial/ethnic group[8]. The scores reflect the probability of any two randomly drawn individuals from a neighborhood to belong to different subgroups. Six racial/ethnic categories were included: non-Hispanic whites, non-Hispanic blacks, Hispanics, Asians, Native Americans and others. Higher values indicate higher levels of diversity. The *Language Diversity* index accounts for the language individuals speak at home and is based on 25 languages[9] such as Spanish, French, Italian, Portuguese, German, Polish, Russian, Greek, Japanese, Korean, or Arabic (Graif and Sampson 2009).

The *Diversity of White Ancestry Index* builds on 34 categories[10], such as Polish, German, Irish, Italian, Russian, Greek, Swedish, and French. Also added was the percentage of residents who report *Multiple Ancestries* (Alba 1992; Waters 2000; Okediji 2005). The *Hispanic Diversity Index* refers to the diversity of origin for Hispanic residents (Portes and Truelove 1987) grouped into 15 categories, Mexican, Puerto Rican, Cuban, Costa Rican, Argentinean, Chilean, and others. The *Asian Diversity Index* refers to Asian origin, such as Chinese, Asian Indian, Cambodian, Filipino, Japanese, Vietnamese[11]. The *Regional*

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[7]The natural logarithm adjusts for the skewed distribution. One was added to all values so that the natural log of a zero would become a natural log of 1, equal to 0.

[8]The advantage of using the Herfindahl index over other measures of diversity is that it captures two diversity dimensions (Massey and Denton 1988): richness (the number of different groups co-residing in a neighborhood) and evenness (the extent to which groups are evenly distributed in a neighborhood). Also constructed was an *entropy* index of racial diversity, similar to Thiel's H, based on logarithmic transformations. The correlation between the Herfindahl and the entropy indices is very strong and the multivariate results are similar independent of the index used.

[9]Although the 2000 Census has greatly improved its racial/ethnic measurement compared to previous years, in constructing change scores over time some of the pre-2000 data limitations influence the extent to which the 2000 items can be used.

[10]Ancestry refers to a "person's ethnic origin, heritage, descent, or 'roots', which may reflect their place of birth, place of birth of parents or ancestors, and ethnic identities that have evolved within the United States" (Brittingham and de la Cruz 2004).

Diversity Index is based on Census data on the U.S. region that residents were born in: Northeast, Midwest, South, or West[12]. The five subgroups contributing to the *Immigrant Diversity Index* score are foreign-born residents residing in the United States for five years, 5-10 years, 10-20 years, 20-30 years, and more than 30 years. Most of the indices are calculated using the Herfindahl formula.

These different diversity indices highlight related but different facets of Chicago's urban scene. A principal component analysis of all the diversity indices yields two main orthogonal factors based on which composite scales of diversity were constructed (see Tables 2 and 3). One scale, *Diversity of Ancestry,* includes weighted factor scores of diversity of ancestry and the percentage of residents reporting multiple ancestries, which load together, separately from the other diversity indices. Language diversity, regional diversity, racial/ethnic diversity, Hispanic diversity, Asian diversity, and immigrant diversity all loaded on a distinct factor, summarized as the *Intercultural Diversity Index*. Using two uncorrelated scales rather than eight highly correlated diversity indices helps avoid multicollinearity.

Structural Controls

Economic factors likely influence people's residential decisions (Zukin 1987). If artists rent more than own their homes and do not have reliable incomes, they may seek out neighborhoods based on housing affordability. To understand the role of diversity independent of the attraction of low neighborhoods' rent levels and socioeconomic status, the multivariate models include controls for several factors. One such control is the 1990 *median gross rent* and its change over time, after adjusting for inflation. Other socioeconomic indicators are the percent of households using public assistance, the percent of individuals in poverty, the percent of female-headed households, and the percent of unemployed residents -- key measures of the *concentrated disadvantage* index (Wilson 1987). Given the strong correlations among these indices, a composite index was constructed as the average of the four items weighted according to their loads on the single factor resulting from a principal component analysis. These indices consistently cluster together in Chicago independent of the measurement year[13]. *Population density* was also included as a control, measured in persons per square kilometer of land area.

Analyses also include *a gay index*, based on Census data on households with the householder and unmarried partner were both males (Gates and Smith 2001), calculated as the number of gay households, for every 100 residents of a tract[14] (see Table 3). A Starbucks

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[11]Non-Hispanics (or non-Asians) were included as a distinct category in computing these indices so that the Hispanic and Asian diversity items would not have missing data for tracts where no members of these two minorities live. Initial calculations that excluded the non-Hispanics and the non-Asians yielded largely similar results.

[12]To avoid missing values, this index includes natives born overseas and foreign-born in one category.

[13]PCAs, with Varimax rotation, on the diversity indices and on the structural indices, revealed a consistent factor structure in both 1990 and 2000. The PCA was repeated on the pooled data using a dummy variable to flag the source year and found no significant loading on the dummy factor. Thus, the socioeconomic factor and the diversity scores are based on the pooled data to produce comparable indices across years. Unlike other studies, the percentage of blacks was not included in the disadvantage index in order to avoid an overlap with the diversity index.

[14]A parallel *same-sex index* was created based on counts of both female couples and male couples. It was strongly correlated to the gay index in the 1990 and the 2000 Census (r-values of .84 and .92). Moreover, the two indices are similarly associated with the other measures. Only results based on the gay index are presented in order to compare the findings here with prior findings.

index is included as a proxy control for related aspects of the neighborhood's built environment, services, and amenities. This was motivated by studies that indicate correlations with other coffee shops and types of amenities (Clark 2004a) that might affect artists' residential choices. With few exceptions (e.g., Papachristos et al. 2011), little systematic research exists on the implications of coffee shops and Starbucks for neighborhoods or individuals' mobility. Still, it seems reasonable to expect that they may serve as meeting grounds for artists and other residents with non-traditional work places. Data on the location of Starbucks stores in Chicago in 2004 was collected, standardized, and geocoded specifically for this study. The geographic coordinates of the over 300 Starbucks stores in Chicago were matched to the enclosing census tract and used to generate a corresponding index score for each tract. These data were merged with the main neighborhood attribute data file and joined to a polygon shape file containing geographic reference data, which were used in mapping and spatial analyses. The *Starbucks index* is calculated as the natural logarithm of store concentration per 1000 residents, plus one. The scores range from 0 to 9.50 stores per 1000 residents[15].

MODELING SPATIAL INTERACTIONS

Characteristics of the surrounding areas are also likely to influence one's perception of a neighborhood. For instance, a nearby area with a lively art scene may appeal to prospective residents independently from the immediate neighborhood art scene (Lloyd 2006). One way to represent the outcomes of social and spatial processes is a spatial lag model. Estimating regular least square models when spatial lags are more appropriate is equivalent to introducing an omitted variable error. When assumptions of uncorrelated error terms and independent observations are violated, the OLS estimates are inefficient and biased. The general specification of a spatial lag regression in matrix notation (Anselin 1988) is:

$$y = \rho Wy + X\beta + \varepsilon, \quad (1)$$

where y is a Nx1 vector of observations on the dependent variable, ρ is a spatial autoregression coefficient, and W is a row standardized NxN spatial weights matrix, in which the non-diagonal cell values are determined as a function of a neighborhood's spatial proximity to another. The weights are standardized such that $\sum_j w_{ij} = 1$, for any *i*. Wy represents the spatially lagged dependent variable. X represents a NxK matrix of exogenous explanatory variables. β is a vector of regression coefficients. ε is a Nx1 vector of random, normally distributed, independent, and homoskedastic disturbances. Equation 1 estimates the concentrations of artists in 2000 and the density of art nonprofit organizations in 2006 (Table 4), based on independent variables as measured in 1990.

When the observations span time and space, both spatial and serial dependence can be parametrized in a space-time dynamic regression model (Anselin 2001; Elhorst 2001) that

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[15]The earliest geocodable data available for the Starbucks index were for the year 2004. While the index could not be used in models predicting artists' concentration in 2000 it could be used in predicting art non-profit organizations, measured in 2006. Nonetheless, the patterns in the results are unchanged when excluding the Starbucks index. Moreover, using data on independent coffee shops as control in the main estimations instead of the Starbucks index led to similar results.

includes temporally- and spatially-lagged variables. When real, omitting spatial dependence can bias the estimates (Anselin 2001). To verify the robustness of the findings to different specifications, the next analyses apply several different techniques to model changes across time and space. First, the spatial fixed effects are eliminated while allowing for the specification of spatial lag for the dependent variables as well as temporal lag for the dependent and predictor variables (Elhorst 2001):

$$\Delta y_{90-00} = \tau y_{90} + \rho W \Delta y_{90-00} + X_{90}\,\beta_1 + \Delta X_{90-00}\beta_2 + \varepsilon, \quad (2)$$

where $y_{90\text{-}00}$ represents a Nx1 vector of change scores in y between 1990 and 2000, y_{90} represents a Nx1 vector of serially lagged y. W $y_{90\text{-}00}$ represents the spatially lagged change in y from 1990 to 2000. In models of organizational change, time 2 for the dependent variable is 2006. ρ is a spatial autoregression coefficient and W is a NxN spatial weights matrix, in which the non-diagonal cell values are a function of a neighborhood's first-order spatial contiguity to each of the other neighborhoods, based on commonly shared borders (using the Rook criterion). $X_{90\text{-}00}$ represents a NxK matrix of change scores in the k exogenous predictors between 1990 and 2000. X_{90} is a NxK matrix of serially lagged predictors. ε is a Nx1 vector of normally distributed, independent, and homoskedastic disturbances[16]. This equation is used to estimate the Table 5 models. Additional analyses use a residual change specification (see Appendix).

Analytical strategy

Analyses are conducted in several steps. First, the spatial distribution and neighborhood clustering patterns of artists, art organizations, and diversity are assessed across the city as are the patterns of spatial covariation between diversity and artist clusters. Next, a first set of multivariate estimations based on equation 1 investigates the extent to which diversity indices in 1990 predict artist clusters in 2000 and art organizations in 2006, after controlling for potential confounders and other socioeconomic and other demographic controls, such as concentrated disadvantage, median neighborhood rent, population density, and the concentration of same sex populations (Table 4). Spatial lags are included to assess the degree to which potential spatial spillovers exist net of controls and the extent to which the relationships between diversity and artist clusters are robust to adjusting for spatial spillovers. Time lagged (1990) versions of the dependent variables are then also added to assess the degree to which later values vary above and beyond what would be predicted from previous levels. Also estimated is the extent to which prior artist concentrations predict later levels of organizational density.

Finally, a second set of multivariate models based on equation 2 investigate two types of change models. First, they estimate raw change between 1990 and later neighborhood concentrations of artists (2000) and art organizations (2006), as a function of 1990 diversity

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[16]In contrast to other estimations used for panel data analysis, the maximum likelihood (Doreian 1982) approach used here yields estimators that are asymptotically more efficient and yield a more accurate estimation of fixed effects dynamic panel models that include a spatial lag of the dependent variable (Elhorst 2001). All analyses were reiterated using OLS, ML spatial lag, and ML spatial error estimations, respectively. While the results indicate the same pattern of results independent of the method, the Lagrange Multiplier (LM), Robust LM, and AIC scores suggest that spatial lag specifications are slightly more appropriate.

levels and corresponding changes between 1990 and 20000, net of socioeconomic and demographic covariate levels in 1990 and their changes between 1990 and 2000. Second, they estimate residual changes over time in the concentrations of artists and organizations to reflect the neighborhood-specific level of change that is unexpected relative to the general changing pattern across the neighborhoods in the city. See the Appendix for more details. Both sets of models improve on the ones presented in Table 4 by additionally: a) controlling for temporal changes in all the core explanatory variables and b) assessing specifically the net link between changes in diversity and changes in artists and art organizations. These additions are important because neighborhoods change between 1990 and 2000 quite a bit in ways that can influence the outcome. All estimations assess and adjust for spatial interdependencies. The models predicting change in organizational density also control for Starbucks stores density as a proxy for related amenities (Table 5).

If results show that diversity indices predict lower later levels or decreasing concentrations of artists and art organizations, they would be consistent with social disorganization expectations (*hypothesis 3*). If they show that diversity predicts higher or increasing artist and art NPO concentrations, they would be consistent with the core version of the creative class and expectations based on insights on subcultural intensification (*hypotheses 1and 2*). A significant association of changes in artist concentration over time with the 1990 diversity indices with would be consistent with a lagged diversity effect while a significant association with the 1990 to 2000 change in diversity would suggest linked contemporaneous changes.

MAPPING CHICAGO'S CREATIVE HOTSPOTS

Artist neighborhood concentration levels are strongly clustered spatially (Moran's I = .583) and so are artists' numbers (Moran's I = .617). Artists cluster most strongly in the northeastern part of the city in some of the wealthier white communities like Lincoln Park and Lake View but also in less affluent and more diverse communities like Uptown, West Town (Wicker Park) and Logan Square (Figure1)[17]. The net increases in artists between 1990 and 2000 (new arrivals or entrants into the occupation relative to artists who have moved out, died or exited the occupation) overlap in part with their prior spatial clusters (Moran's I = .314). Some diverse neighborhoods, like Wicker Park have been consistent artist destination throughout the decade. Yet, some important changes emerge as well. Some tracts with a strong presence of artists in 1990 (e.g., Lincoln Park, Rogers Park, South Deering) suffered net losses; other neighborhoods, like Austin, with few artists in 1990, experienced large inflows by 2000. The spatial clustering patterns of art-related nonprofit organizations (Moran's I = .534) are reinforced by the corresponding measure of neighborhood density of art organizations (Moran's I = .457). Moreover, the spatial distribution of art organizations overlaps significantly with the spatial distribution of artists (Moran's I = .380), consistent with qualitative accounts about the location of nonprofit performing organizations by Poon and Lai (2008) in other cities. The spatial distributions of neighborhood intercultural diversity in 1990 and artists' spatial concentration levels in 2000

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[17]These communities are home to events such as the Palmer Square Park Arts Festival each year in August (Logan Square) and the "Around the Coyote" (Wicker Park) festival launched in 1989. Little Vietnam, a popular entertainment district, is in Uptown.

are depicted in Figure 1's leftmost map. A darker shade indicates a higher level (i.e., quartile) of neighborhood artist concentration. A larger "D" indicates a higher diversity score (the upper half of the distribution). The rightmost map indicates changes in diversity and in artist concentration. The bivariate links indicated by these maps do not account for potential confounders. Still they are informative in highlighting the spatial clustering of the Chicago's artists, some beginning indications of an overlapping pattern with diversity (as well as some divergent clustering), and changes in their distribution across space and time.

MULTIVARIATE ESTIMATIONS

Diversity and Spatial Concentrations of Artists and Art Nonprofit Organizations Recall that the hypotheses suggested either a positive link (*hypotheses 1 and 2*) or a negative link (*hypothesis 3*) between prior levels of diversity (1990) and later levels of (Table 4), and increases over time in (Table 5) the residential concentrations of artists and art organizations. Table 4 presents the results from maximum likelihood spatial analyses that estimate the role of diversity and other neighborhood socioeconomic characteristics in 1990 on the concentration of artists and nonprofit art organizations in. The roles of the 1990 levels of inter-cultural diversity and diversity of ancestry on the 2000 levels of artist concentration are positive and significant, net of neighborhood gay concentration and spatial spillovers (model 1). These results are additionally robust to adding demographic and socioeconomic controls (model 2), and to including the temporal lag (model 3). This indicates that, independent of the role of gay concentration, disadvantage, rents, or population density, higher levels of neighborhood diversity predict higher concentrations of artists at a later point in time and increases in the concentrations of artists over time, consistent with the *local creative class and subcultural hypothesis 1*. Neighborhood gay concentration in 1990 is also significantly and positively associated with the concentration of artists in 2000, even when controlling for diversity (model 1) and other socioeconomic and demographic factors (model 2). Results from estimations of model 3 indicate, however, that the gay concentration association is not robust to controlling for 1990 levels of artist concentrations. Moreover, it is important to note that higher levels and increases in artist concentrations in a particular neighborhood are also predicted by spatial proximity to neighborhoods of higher concentrations of artists.

Results from estimations of models 4 and 6 of Table 4 indicate that higher neighborhood concentrations of artists in 1990 predict higher densities of nonprofit art-related organizations in 2006, even after controlling for neighborhood traits such as population density, socioeconomic disadvantage, or median rent levels in 1990. The results are also robust to controlling for the 1990 densities of art-related nonprofit organizations (model 6), suggesting that at the same levels of art-related organizational density in 1990, neighborhoods with higher concentrations of artists in 1990 significantly increased their art organization densities over time.

Importantly, independent of other characteristics, even when controlling for the 1990 artist concentration, neighborhood levels of inter-cultural diversity in 1990 predict positively and significantly the art-related organizational density in 2006 (models 5 and 6), supporting *hypothesis 2 of subcultural intensification*. When controlling for previous levels of organizational density, the diversity coefficient remains positive and becomes more precise

in predicting the 2006 level of nonprofit art organizational density (model 6). Additionally, the art-related organizational densities of a neighborhood are positively associated not only with their own levels of corresponding art-related organizational density levels years earlier in time but also with the corresponding art-related organizational density levels in the nearby areas.

Similar results emerge from equivalent models that use 2000 levels of neighborhood diversity and other characteristics to predict the 2006 densities of art (table available at request). While the role of inter-cultural diversity in 2000 remains significant, the coefficient of ancestry diversity for 2000 becomes marginally significant after controlling for the 2000 level of artists concentration, suggesting that on a shorter time span, this dimension of diversity may play a somewhat more indirect role (through artists) on increasing the local art organizations' presence.

In supplementary analyses (not shown), based on models otherwise equivalent to those in Table 4, results indicate that, even net of controls, higher 1990 levels of inter-cultural diversity and diversity of ancestry predict higher concentrations of gay households in 2000. These findings are consistent with possible mechanisms underlying *hypothesis 1*, which suggests that diversity may increase tolerance for subcultures (Fischer 1975) and unconventionality, broadly defined (Florida 2002).

Table 5 presents results from maximum likelihood spatial estimations of neighborhood level changes in artist concentrations between 1990 and 2000 and in the density of nonprofit art organizations between 1990 and 2006, as a function of socioeconomic indicators in 1990, net of changes in indicators over the 1990s decade. The table includes results from analyses using raw change indicators and from analyses using residual change indicators. The findings indicate that higher 1990 levels of inter-cultural diversity predict increases in artists concentration between 1990 and 2000, whether controlling or not for other socioeconomic indices and their change scores over time, supporting *hypothesis 1*. The diversity of ancestry index in 1990 predicts increases in artist concentration over time, even after controls, but the significance level dilutes to non-significance when using the residual change specification. Compared to diversity of ancestry, the role of 1990 intercultural diversity on changes in artist concentration appears stronger and more robust to different model specifications, offering stronger support for the main *hypothesis 1*. In supplementary analyses (not shown), the log (natural) of 1990 levels of each of the diversity indices was also used in models otherwise equivalent with those in Table 5. A small constant was added to each index score to circumvent taking the log of 0 for those neighborhoods with small diversity levels. The results were substantively similar to those based on the main models.

Change in inter-cultural diversity between 1990 and 2000 shows some negative tendency in predicting change in artist concentrations during the same time but it is not robust to the residual change specification. Increases in diversity of ancestry however remain robust in predicting increases in artist concentration over time. Compared to the coefficient of 1990 diversity, this coefficient reflects variation in diversity that is closer in time to variation in artist concentration. Together these coefficients indicate lack of support for the *social disorganization hypothesis 3* and stronger support for the *creative class hypothesis 1*.

The role of the 1990 gay concentration and its change levels over time is positive and significant in predicting change in artist concentration, as is the role of spatial contiguity. The negative coefficient of the 1990 (time-lagged) artist concentration in models predicting change in artist concentration between 1990 and 2000 (models 1a and 2a) stands in contrast with the positive coefficient of the same index in predicting the 2000 neighborhood levels of artist concentration. The contrast may indicate a tendency for regression to the mean (Allison 1990), whereby neighborhoods with highest levels of artist concentrations in 1990 attract new artists at a slower rate than neighborhoods with more moderate levels of artist concentrations in 1990, even as the former neighborhoods remain the highest ranked on this index in 2000. The 1990 level of artist concentration predicts increases in the density of nonprofit art organizations, net of socio-economic controls, change scores, or spatial contiguity, under both the raw or residual change specifications (models 4a and 4b). Models 3 and 4 indicate that the 1990 levels of inter-cultural diversity and diversity of ancestry predict increases in the density of nonprofit art organizations between 1990 and 2006, even after controlling for neighborhood socioeconomic characteristics in 1990, when controlling for 1990 levels of art NPOs and net of 1990 gay concentration or Starbucks density.

The coefficients of change in inter-cultural diversity between 1990 and 2000 are non-significant in the residual change models. In contrast with its positive association with inter-decade changes in artist concentration, the 1990 gay concentration level seems to have a more negative role in predicting residual changes in the density of art NPOs (models3b and 4b). The 2004 neighborhood density of Starbucks stores is positively associated with changes in the density of art and art-related nonprofits (models 3 to 4) in their raw-change models but becomes insignificant in the residual score models with all the controls.

In sum, the results indicate that the positive role of diversity in attracting increasing concentrations of artists across neighborhoods is compounded by its positive role in attract increasing numbers of art-related NPOs in Chicago.

Comparing artists with other creative class subgroups

Supplementary analyses were conducted with other occupation groups included in Florida's creative class: a) the "supercreatives", excluding artists but including scientists and engineers; and b) the "periphery" of professionals and managers. In analyses otherwise equivalent to those in Table 5, the 1990 diversity of ancestry continued to predict increases in these subgroups. Moreover, the 1990 intercultural diversity stayed positive when predicting increases in scientists and engineers but became negative when modeling professionals and managers. Both subgroups were significantly and positively predicted by artists' location. This indicates that while professionals may follow artists, they differ in ways that lead to clustering away from neighborhood level intercultural diversity. Such differences provide support against treating the creative class and their local mobility patterns as homogenous (Markusen 2006).

DISCUSSION

This study explored Chicago's citywide changes in neighborhood socioeconomic and institutional characteristics over time and showed that neighborhoods' diversity levels

predicted differential patterns of spatial distribution of the artist scene over time. The results indicate that artists and art nonprofit organizations locate in a particular neighborhood in ways that both maintain and reshape the spatial hierarchy of neighborhood stratification. The findings show that artists' urban dwellings are significantly clustered across Chicago. The net inflows of artists across neighborhoods in the 1990s illustrate the clustering pattern over time and the neighborhoods that have significantly grown into artist hotspots. The art and art-related nonprofit organizations in Chicago also cluster significantly in space, similar to findings in the Twin Cities (Markusen 2006). Moreover, their clustering patterns overlap to an important extent with that of artists, consistent with qualitative accounts (Poon and Lai 2008). Nevertheless, even after controlling for artist concentrations and other indices, the spatial proximity indicator remains significant in predicting later densities and increases in art and art-related NPOs. In predicting changes on the core measure of art NPO density, net of other neighborhood characteristics, the spatial clustering role dilutes to non-significance, indicating that socio-demographic processes may account for most of the clustering processes behind the spatial distribution of newly registered art NPOs.

The concentration of the artist scene within a neighborhood strongly predicts higher concentrations in nearby areas, even after controls. This is consistent with prior studies of larger areas (e.g. Patterson and Silver 2015) and indicates evidence of local spatial spillovers. These spillovers may be, to an extent, related to imperfectly identified neighborhood boundaries (Anselin 1988). Nevertheless, spillovers may also reflect processes of diffusion if, for instance, inter-neighborhood residential mobility is more likely when neighborhoods are closer to, rather than father from, each other across the geographic space. Alternatively, they may capture a type of inter-neighborhood contagion -- the extent to which artists decide to move into a neighborhood based on the artist concentration levels of contiguous areas. Further research would benefit from exploring more complex interaction models, specifying in more detail the processes underlying the inflows and outflows of groups from one neighborhood to another (Graif 2015, 2016; Graif, Gladfelter, Matthews 2014) and from following individual-level data to illuminate patterns of spatial mobility over time. A key implication of these findings for social policy is that isolated redevelopment efforts centered on a particular neighborhood may be more effective when accompanied by similar interventions in the surrounding areas.

Diversity and Artists Hotspots

The spatial analyses indicated that higher levels of intercultural diversity in 1990 predict higher concentrations of artist, art, and art-related NPOs even after a decade or more. They also predict increases in the concentration of artists during the 1990s decade and in the density of art NPOs between the early1990s and the middle 2000s. The results are robust to different specifications of change, to adding controls for gay concentrations, socioeconomic disadvantage, population density, and even to adding controls for 1990 levels of artists or art NPO concentrations. The core findings are consistent with Florida's creative class thesis and with Fischer's subcultural theory of urbanism, which suggest that diversity may increases tolerance, place character, and intercultural diffusion, attracting creative groups.

In contrast to the positive role of the 1990 *level* of intercultural diversity on changes in artist concentrations and density of art and art-related NPOs over time, the role of *change* in intercultural diversity between 1990 and 2000 on these outcomes varies from non-significant to negative. For neighborhoods with similar levels of intercultural diversity and similar artist concentrations in 1990, an increase in diversity by 2000 is associated with a raw decrease in artist concentration and art-related NPO density over the same period of time. This suggests that while over a longer period of time diversity may attract artists and art NPOs, in the shorter run the association may even work in the opposite direction. This is consistent with social disorganization ideas that diversity leads to mistrust, inter-group tensions, or violence (e.g., Shaw and McKay 1942; Smelser and Alexander 1999; Putnam 2007), which would make a place less attractive to artists in the short run. Still, the residual change in diversity effect which adjusts for the city-wide pattern of change is not significant. Combined with the positive effect of diversity in the longer run, the results suggest a complex process that unfolds in stages over time.

The role of diversity of ancestry in 1990 in predicting 2000 levels and changes in artist concentration over time follows a similar positive pattern as the role of intercultural diversity with one exception: it becomes insignificant in the residual change models. Increases in the diversity of ancestry over time, however, are consistently associated with increases in artist concentrations or in the density of art and art-related NPOs, suggesting that ancestries may be less threatening symbols of distinction (Alba 1992). Different ancestry groups may not need the same accommodation period as other ethnic or origin groups. The findings suggest that while intercultural diversity may be a more reliable predictor of artist concentrations than the diversity of ancestry over the long run, diversity of ancestry may be a more reliable predictor of the artist scene in the short term.

The specific mechanisms that contribute to the association between diversity and artists cannot be directly tested with the data used here. Multiple and even conflicting mechanisms could operate to some extent at more micro level. Still, the findings are, in the aggregate, more supportive of subcultural intensification expectations. The subcultural mechanism is related to the idea that population diversity increases over time residents' tolerance of unconventionality (Fischer 1975; Wilson 1985; Florida 2002). If gays and "bohemian" artists can be viewed as unconventional subcultures (Zukin 1998), that both intercultural diversity and diversity of ancestry predict in time higher neighborhood concentrations of gays and artists is consistent with ideas that these groups' perceptions of neighborhood tolerance may affect their residential patterns. Gay concentrations also predicted higher and increasing densities of artists and art NPOs, consistent with Florida's thesis (2002) that the creatives are attracted to places of higher diversity, broadly construed. The presence of gay communities may signal a place's open-mindedness to diversity of views and freedom of expression. While some minority groups may be indifferent or hostile to gays and artists, given the social distance and power differentials between them, tolerance may still manifest on a transactional level, (Lloyd 2011; Simmel 1903; Shaw and Sullivan 2011; Zorbaugh 1929), The findings also support Fischer's (1975) thesis that local cultural heterogeneity increase over time the size of unconventional subcultures through institutional intensification. It is informative that the link between diversity and artists is robust to controlling for gays' presence.

This study does not test specific mechanisms but findings are consistent with prior thinking that that concentrations of diverse and unconventional groups may add to the idiosyncrasy of street life and of the vitality of the local cultural scene (Jackson et al. 2006) , contributing to perceptions of local authenticity (Lloyd 2006; Mele 2000) and to a neighborhood's experiential magnetism. Immigrants and African Americans can also be creative, and there is evidence that in some Chicago neighborhoods, like Rogers Park, Bronzeville, or Pilsen they stimulate cultural revitalization and local art scene growth (Grams 2010). Perhaps some of the attraction of diversity works through some of the amenities it spawns, amenities which may in turn serve as artist meeting grounds -- important loci for social interaction and information exchange --, increasing their visibility and attraction to new artists. The findings show that, for instance, the density of Starbucks stores at one point in time tends to be weakly but positively associated with later levels of, and increases in, the density of art and art-related NPOs, contributing to further intensification of the artist scene (Clark 2004a). Artists may prefer independent coffee shops over Starbucks or Starbucks may follow after artists move into an area. Thus, it is important that the observed role of diversity in shaping the artist scene is also robust to using independent coffee shops as alternative control or excluding this type of index from the models. Still, to the extent that the locations and neighborhood densities of Starbucks or other coffee shops in Chicago are associated with other built amenities like pubs, bookstores, libraries, whole foods stores, and juice bars, or art and bicycle events, as studies suggest (Clark 2004b), the results are consistent with arguments that amenities contribute to the vitality of the local scene and to neighborhood growth (Zukin 1987; Clark 2004a; Lloyd 2006; Papachristos et al. 2011).

Jackson and collaborators (2006) suggest that the presence of working artists in a place supports artistic activities and indicates cultural vitality. Still, further work is needed to measure and test the importance and determinants of unconventionality and cultural vitality of places (Markusen 2014). Beyond tolerance for unconventionality or the vitality of street life, other mechanisms of attraction may be at play as well. Perhaps, artists are attracted by, and draw creative inspiration from, potential cross-cultural tensions and conflict underlying street level interactions among diverse groups of residents. When diverse communities learn to overcome potential tensions and cultural clashes, by the end of their struggles, they may emerge better off than otherwise equivalent homogenous communities, consistent with Fischer's argument that diversity is conducive to inter-group diffusion and hybridization of cultural elements. Prior research supports this idea. A New York study (Kasinitz et al. 2002) attributes the emergence of creative hybrid cultures to "fluid exchanges across group boundaries" between immigrants and native minorities, as they interact in a diverse environment and contribute to a "creative multiculturalism" (p. 1033-34). The findings suggest that diversity attracts artists by providing audiences of varied tastes --an informal "research-and-development" laboratory for innovative cultural works (Lloyd 2006; Markusen 2006). Artists may benefit from contact with diverse groups by developing a wider cultural repertoire. As Erickson (1996) suggests, "those who have many cultural weapons can find one to suit the battle at hand, whether in the business company or in social company" (p. 219). The chance to build intercultural competencies may motivate artists' residential choices (Mele 2000).

An important limitation of this study is that the time period in focus, 1990-2006, misses recent changes in arts employment, consumption, and gentrification patterns. While the two decades before 2000 saw great growth and spatial diffusion in the arts industries across the country, they were followed by patterns of slow growth and even decline, in part related to the Great Recession (Grodach et al. 2014; Patterson and Silver 2015). Chicago metropolitan area also experienced recent declines in employment in the arts and design industries, though it maintained its sizeable art employment and remains in the top 10 metro areas for arts industry employment (Grodach 2016).. Future research will benefit from assessing whether creative class forces continue to overcome social disorganization forces during more recent times, under different conditions, in different cities, and at other levels of analyses.

CONCLUSION

This article showed evidence that neighborhood intercultural diversity predicts increases in the spatial concentration of artists and nonprofit art and art-related organizations over time across more than 800 neighborhoods in Chicago. These results contribute to the academic literature and urban policy debates on the creative class and advance our understanding of the role of diversity for neighborhood growth in the context of dramatic increases in the diversity of urban residents in the U.S. in the past decades. The study brings a new light to social disorganization assumptions by showing that over time diversity can benefit the neighborhood (Graif and Sampson 2009) by stimulating the intensification of the local artist scene. The results are consistent with the creative class thesis and with the subcultural theory of urbanism, which suggest that urban diversity operates as an engine of neighborhood growth by cultivating an unconventional, creative environment (Fischer 1975; Florida 2002), which attracts and intensifies the local artist scene over time.

The current study represents a first systematic integration of the creative class and subcultural arguments at the local level to discover the temporally and spatially dynamic processes connecting diversity to the clustering of artists. In the tradition of the Hull-House maps (Addams et al. 1895)[18] and the Chicago School (Shaw and McKay 1942), the findings highlight the value of mapping and spatial analysis in evaluating a social theory -- supporting Fischer's point that despite "space-transcending technologies […] space continues to matter" (1995, p.551).

The findings are consistent with Zukin's view that "immigrants, racial and ethnic minorities and gays and lesbians have become more visible actors in both the public spaces and cultural fields, they have made a variety of 'alternative' lifestyles more visible. Both at work and at leisure", she argues, "these groups have had the singular effect of defining 'urban' cultures', [which are] the raw materials of the symbolic economy's growth" (1998, p. 825-6). As diversity fosters higher levels and increases in densities of artists and art NPOs in Chicago, the intensified local art scene in turn contributes to stabilize and revitalize the communities within which they are embedded (Strom 2001; Markusen and Schrock 2006). Ever since the

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[18]The *Hull-House Maps and Papers* (Addams et al. 1895) presented color-coded maps of the distribution of residents of different nationalities around the Hull House in Chicago's Near West Side

early 1980s till the later 1990s, the inflow of artists in Wicker Park, for instance, was attributed a key role in increasing the community's education and income levels (Lloyd 2006). Across cities and regions, Florida (2002) and others (Wojan et al. 2007; Florida et al. 2008) show that diversity and creative groups associate with increases in highly educated population, patents, and jobs.

Understanding the spatial distribution patterns of artists and art nonprofits is significant because a vibrant artist scene will not only decrease disadvantage and generate revenue and jobs in a local community (Foster et al., 2016) and in the larger region (Americans for the Arts 2006; Markusen 2006), but it may operate as a instrument of local social integration and brokerage of key actors and resources to the benefit of the neighborhood residents (Mele 2000; Grams and Warr 2003; Stern and Seifert 2008; Grodach 2011) while local art activity may also contribute to "branding" or rebranding a place (Currid 2009). Lloyd (2006) notes that artists play important roles in creating what others perceive as an authentic and desirable community and by shaping a community's physical or symbolic amenities. Artists and organizations together may become part of the desirable local amenities that attract tourists and other residents (Currid 2009). This is consistent with the idea that beyond the role of diversity, artists and art organizations may be themselves contributing to neighborhood character. Comparing Santa Barbara and Ventura, Molotch et al. (2000) found that differences in museums and art galleries, commercial art, and graphic design, correspond to differences in the perceived *place character*, which attracts businesses and improves the quality of life for the elite and disadvantaged residents alike (Jacobs 1961). Three decades ago, Suttles (1984) drew on cultural ecology to note that "[a]menities, aesthetics, social character, and services figure heavily in residential choice, and residential choice may drag along with it many firms' locational choice" (1984, p. 287) calling for research on the c*umulative texture of urban local cultures*.

Much work remains to be done to understand how diversity and artists influence perceptions of neighborhood character and how they further affect neighborhood revitalization (Noonan 2013). Research has shown that non-profit organizations and amenities like coffee shops that are associated with artist concentration contributes to lower crime levels (Papachristos et al. 2011, Sharkey et al. 2017). Still, important concerns remain that such processes also lead to gentrification, pricing-out minority old-timers and even the bohemian artists and pushing them out of the neighborhood (Freeman 2005, 2011; Grodach et al 2014; Patterson and Silver 2015; Zukin 1998). More research is needed on this but studies indicate that some art venues contribute to positive neighborhood growth without changing fundamentally its residential population (Woronkowicz, 2016). The nature of artists' work and the extent to which it integrates the community, if it includes local youth in the process, for instance (Stern and Seifert 2008), may offer pathways to revitalization more protective than others against subsequent social exclusion of the very diverse groups that contributed to neighborhood growth.

Acknowledgements:

APPENDIX

Art organizations index.

The list uses a definition of art organizations that includes NTEE codes A6a, A6b, A6c, and A6e and A01 through A69 but excludes art programs associated with colleges and some NTEE cultural or humanities activities (e.g., some museums, humanities organizations, historical societies, commemorative events, and art service organizations). Also excluded were organizations such as political lobbying groups, vocational societies, non-artistic cultural groups, and general support groups. The IRS data (Internal Revenue Service 2008) is derived from the Form 1023 and Form 1024 used by 501(c)(3) organizations and by non 501(c)(3) organizations, respectively, to apply for recognition of tax-exempt status. Most 501(c)(3) organizations are required to register, except those that are religious or public exempt with gross receipts below $5000. All private foundations are required to register. The IRS data is cumulative and intended to only include active organizations that provide services at the time of the file release. GuideStar carefully reviews and revises information derived from the IRS files, including forms 990 and 990-EZ, which public charities with gross receipts over $25,000 are required to file, and from forms 990-PF that all private foundations are required to file annually.

Alternative controls for neighborhood socioeconomic status.

High house values may affect artists' location decisions by signaling a larger and potentially wealthier pool of customers for art products. Supplementary analyses also include median house values in models otherwise similar to those in Tables 4 and 5. Additional specifications replace house values with neighborhoods' median household income levels as of 1990 and the corresponding changes by 2000. The results indicate that predictive role of diversity indices is robust to using these controls.

Diversity and Segregation.

In Chicago, blacks live in segregated neighborhoods (Massey and Denton 1993). To the extent that diversity associates inversely with the concentration of blacks, the positive association of the clustering of artists with diversity may be connected to racial segregation processes. Moreover, diversity might have different impacts on the creatives in predominantly black neighborhoods. To examine these hypotheses, first, the analyses above were repeated with added controls for 1990 black concentration (plus its change levels in some of the models). The pattern of results did not change, suggesting that across neighborhoods with similar black concentrations, diversity maintains its positive long-term association with artist inflows. Second, neighborhoods with high black concentrations (75% or more) were separated from the rest and additional analyses were conducted on each of the two groups (not shown). The results showed similar patterns as before in neighborhoods with fewer blacks as well as in highly segregated black neighborhoods.

Residual change specification.

Unlike the raw differences, the residual change scores are equal to the *observed* level of population at Time 2 minus the *predicted* level of population at Time 2, where the latter is calculated from a regression equation across all tracts, using population level at Time 1 as a predictor. Residual scores were computed for the dependent and the independent variables. The formula is: $y_{90\text{-}00} = y_{00} - (\alpha + \beta\, y_{90})$. The final residual change models estimated in Table 5 are based on the equation: $y_{90\text{-}00} = \rho W\, y_{90\text{-}00} + X_{90}\, \beta_1 + X_{90\text{-}00}\, \beta_2 + \varepsilon$, where $y_{90\text{-}00}$ represents a Nx1 vector of residual change scores in y between 1990 and 2000. $W\, y_{90\text{-}00}$ represents the spatially lagged change in y from 1990 to 2000. ρ is a spatial autoregression coefficient and W is a NxN spatial weights matrix in which the non-diagonal cell values are determined as a function of a neighborhood's first-order spatial contiguity to each of the other neighborhoods, based on commonly shared borders (the Rook criterion).

$X_{90\text{-}00}$ represents a NxK matrix of residual change scores in the k exogenous predictors between 1990 and 2000. X_{90} represents a NxK matrix of serially lagged predictors. ε is a Nx1 vector of normally distributed, independent, and homoskedastic disturbances. Conceptually, in contrast to the raw change, the residual change specification reflects the extent of neighborhood change that is *not* explained by the initial population level or by the city-wide general pattern of change (Bursik and Webb 1982).

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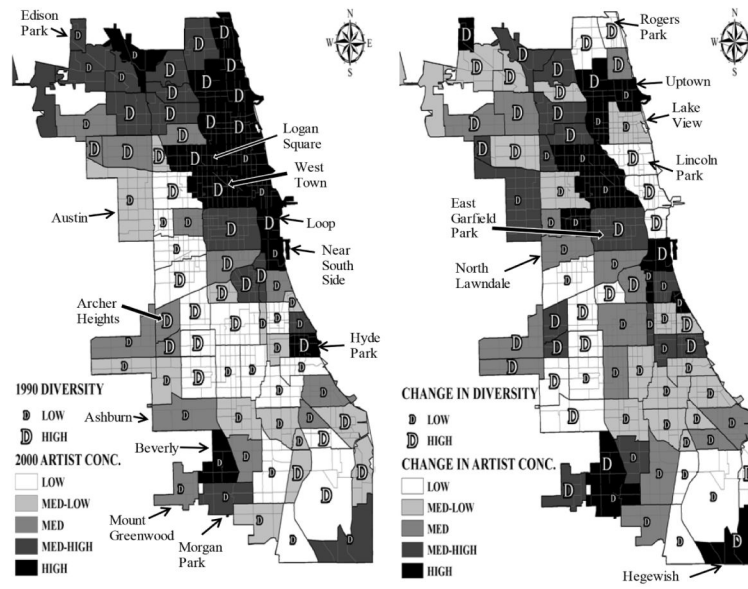
FIG. 1.
Intercultural diversity (1990 levels and 1990-2000 change) by artist concentration (1990 levels and 1990-2000 change) across Chicago neighborhoods

TABLE 1.

CHICAGO ARTISTS BY DETAILED OCCUPATION (CENSUS CODES) AND ART-RELATED NON-PROFIT ORGANIZATIONS BY ACTIVITY CLASSIFICATION (NTEE CODES)

ARTISTS
Main Definition *..
Actors (270); Producers and Directors (271); Dancers and Choreographers (274); Musicians, Singers, and Related Workers (275); Writers and Authors (285); Photographers (291); Designers (263); Artists and related workers (260) .
Extended Definition **...
Actors (270); Producers and Directors (271); Editors (283) Dancers and Choreographers (274); Musicians and Singers (275); Artists and Related Workers (260); Designers (263); Entertainers, Performers (276); Athletes, Coaches (272); Writers and Authors (284, 285); News Analysts, Reporters (281); Photographers (291); Broadcast, Sound, and Radio Operators (290); Other Media and Communication Workers (286, 280, 292, 296).

ART SCAN NON-PROFIT ORGANIZATIONS
Perfoming Arts ....
Performing Arts (A60); Performing Arts Centers (A61); Dance (A62); Ballet (A63); Theater (A65); Music (A68); Symphony Orchestras (A69); Opera (A6A); Singing Choral (A6B); Music Groups, Bands, Ensembles (A6C); Performing Arts Schools (A6E).
Museums and Historical Activites..
Museum & Museum Activities (A50); Art Museums (A51); Children's Museums (A52)
Art and Cultural Activities and Services..
Arts, Cultural Organizations - Multipurpose (A20); Cultural, Ethnic Awareness (A23); Arts Education/ Schools (A25); Arts Council /Agency (A26)
Film, Radio, Print, Media, and Visual Arts..
Media, Communications Organizations (A30); Film, Video (A31); Television (A32); Printing, Publishing (A33); Radio (A34); Visual Arts Organizations (A40)
Art Support, Management, and Advocacy...
Alliance/Advocacy Organizations (A01); Management & Technical Assistance (A02); Professional Societies, Associations (A03); Research Institutes and/or Public Policy (A05); Single Organization Support (A11); Fund Raising and/or Fund Distribution (A12); Nonmonetary Support N.E.C. (A 19).
Total Art-Scan Non-Profit Organizations...

SOURCE.--

*
 Census Bureau Special Tabulation;

**
 Census SF4, Table PCT86

TABLE 2.

DIVERSITY INDICES AND PRINCIPAL COMPONENT ANALYSIS

INTERCULTURAL DIVERSITY*	Factor Loadings
Indices	
Linguistic Diversity..	.867
Categories (25): Speak only English; German; Yiddish; Other West Germanic languages; Scandinavian; Greek; Indic; Italian; French or French Creole; Portuguese or Portuguese Creole; Spanish, or Spanish Creole; Polish; Russian; South Slavic, other Slavic languages; other Indo-European languages; Arabic; Tagalog; Chinese; Hungarian; Japanese; Mon-Khmer; Korean; Native North American languages; Vietnamese; other unspecified.	
Regional Diversity...	.647
Categories (7): Native residents born in state of residence (Illinois); Native born in other state - Northeast; Native born in other state -Midwest; Native born in other state - South; Native born in other state - West; Native born outside the continental US; and foreign born.	
Ethnic and Racial Diversity...	.833
Categories (6): Non-Hispanic whites; Non-Hispanic African Americans; Non-Hispanic Asian and Pacific Islanders; Non-Hispanic Native American; Non-Hispanic other races; Hispanic.	
Immigrant Diversity...	.881
Categories (6): Pct. Foreign born entered us within 5 yrs; Pct. Foreign born entered USA within the past 10 yrs; Pct. Foreign born entered USA 10-20 yrs ago; Pct. Foreign born entered USA 20-30 yrs ago; Pct. Foreign born entered USA more than 30 yrs ago; Native born.	
Hispanic Diversity...	.872
Categories (16): Residents not of Hispanic origin, Residents of Mexican origin; Puerto Rican origin; Cuban origin; Dominican origin; Guatemalan origin; Honduran origin; Nicaraguan origin; Panamanian origin; Salvadorian origin; Other Central American origin, Columbian, Ecuadorian origin; Peruvian origin; Other South American; Other Hispanic origin.	
Asian Diversity..	.494
Categories (12): Chinese origin; Filipino origin; Japanese origin; Asian Indian origin; Korean origin; Vietnamese origin; Cambodian origin; Hmong origin; Laotian origin; Thai origin, other Asian origin; non-Asian.	
Eigenvalue..	*3.721*

DIVERSITY OF ANCESTRY**	
Indices	
Diversity of White Ancestry...	.906
Categories (31): Austrian ancestry; Belgian ancestry: Canadian, Czech: Danish; Dutch; English; Finnish; French; French Canadian; German; Greek; Hungarian; Irish; Italian; Lithuanian; Norwegian; Polish; Portuguese; Romanian; Russian; Scotch-Irish; Scotish; Slovak; Swedish; Swiss; Ukrainian; USA or American; Welsh; Yougoslavian; Other ancestry.	
Multiple Ancestry Population..	.932
Proportion of residents with more than one ancestry.	
Eigenvalue..	*2.174*

SOURCE.-- Census 1990 SF3, Tables P31, P12, P11, P9, P33, P32; Census 1990 SF4, Tables PB28, PB19, PB20; Census 2000 SF1, Tables PCT11, PCT5 ; Census 2000 SF3, Tables PCT10, PCT15, PCT16, P21, P7, P22.

NOTE.--

*
First of two principal components from a PCA of all diversity indices

**
Second of two principal components from a PCA of all diversity indices

TABLE 3.

DESCRIPTIVE STATISTICS OF SOCIOECONOMIC INDICES, DIVERSITY, ARTIST CONCENTRATIONS , AND DENSITY OF ART-RELATED NONPROFIT ORGANIZATIONS ACROSS CHICAGO NEIGHBORHOODS

	1990	2000	CHANGE
Total Population..	3329 (2383)	3459 (2578)	130 (669)
Population Density..	6908 (4520)	6994 (4508)	85 (1792)
Socioeconomic Disadvantage			
Female Headed Families (%)............................	30.354 (17.488)	30.550 (18.442)	.232 (10.706)
Residents in Poverty (%).................................	25.499 (20.462)	22.472 (16.346)	−3.027 (20.837)
Residents Unemployed (%)..............................	14.767 (11.476)	13.207 (10.860)	−1.559 (8.608)
Families w/ Public Assistance (%)......................	18.819 (17.287)	17.416 (14.843)	−1.403 (9.802)
Median Rent..	437.715 (125.313)	612.459 (192.890)	174.744 (134.087)
Gay Concentration..	.109 (.361)	.201 (.360)	.092 (.414)
Intercultural Diversity			
Racial Diversity..	.269 (.226)	.307 (.225)	.038 (.123)
Hispanic Diversity..	.211 (.227)	.241 (.234)	.030 (114)
Asian Diversity...	.055 (.100)	.062 (.103)	.007 (.046)
Linguistic Diversity.......................................	.309 (.229)	.320 (.230)	.012 (.105)
Immigrant Diversity.......................................	.236 (.213)	.270 (.237)	.033 (.103)
Regional Diversity..	.526 (.123)	.523 (.137)	−.004 (.082)
Diversity of Ancestry			
Diversity of White Ancestry..............................	.386 (.341)	.568 (.222)	.182 (.211)
Percent w/ Multiple Ancestry............................	14.314 (13.957)	11.873 (12.249)	−2.441 (7.230)
Starbucks Index [*]..	-	.032 (.150)	-
Percent Artists...	.991 (1.564)	1.164 (1.627)	.146 (1.187)
Density of Art Scan Non-Profit Organizations [**]............	.057 (.264)	.151 (.333)	.104 (.237)

NOTE.--Numbers represent means across Chicago neighborhods (N=836). Standard deviation in parantheses.

[*] The Starbucks data was collected for 2004.

[**] The second and third columns for the Art Scan NPOs index refer to 2006 values and corresponding change from 1990, respectively.

TABLE 4.

ESTIMATES OF NEIGHBORHOOD CONCENTRATION OF ARTISTS, AND NONPROFIT ART ORGANIZATIONS, CHICAGO 1990-2006

1990 Predictors	ARTIST CONCENTRATION (2000)			ART ORGANIZATIONS DENSITY (2006)		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept.........................	.313 ***(.042)	−.153 (.152)	.220 (.147)	.241 ***(.051)	.179 ***(.050)	.086 *(.035)
Inter-Cultural Diversity........	.122 ***(.034)	.110 **(.041)	.108 **(.039)		.040 **(.013)	.037 ***(.009)
Diversity of Ancestry..........	.227 ***(.033)	.211 ***(.045)	.092 *(.044)		.073 ***(.014)	.024 *(.010)
Socioeconomic Disadvantage...		.002 (.055)	−.010 (.052)	−.016 (.013)	.039 *(.018)	.026 *(.013)
Population Density (a).........		.024 **(.007)	.007 (.007)	−.007 **(.002)	−.006 *(.002)	−.002 (.002)
Median Rent (a)................		.744 *(.336)	−.299 (.331)	−.331 **(.108)	−.111 (.109)	−.033 (.080)
Gay Concentration.............	.410 ***(.091)	.376 ***(.093)	.107 (.093)		.067 (.030) *	−.059 **(.022)
Artist Concentration............			.335 ***(.029)	.047 ***(.008)		.032 ***(.007)
Density of Art Organizations..						.870 ***(.029)
Spatial Dependence (Rho).....	.552 ***(.034)	.524 ***(.035)	.377 ***(.038)	.386 ***(.042)	.387 ***(.042)	.157 ***(.035)
R-square	.514	.519	.571	.213	.221	.625
Akaike Information Criterion	2284	2273	2148	374	369	−263
Log Likelihood	−1137	−1128	−1065	−181	−176	141

NOTE.-- Maximum likelihood spatial models. Standard errors in parentheses.

(a) Coefficients and standard errors are multipled by 1000.

***
p<.001,

**
p<.01,

*
p<.05,

†
p<.10

TABLE 5.

ESTIMATES OF CHANGES IN NEIGHBORHOOD CONCENTRATION OF ARTISTS AND CHANGES IN THE DENSITY OF ART ORGANIZATIONS OVER TIME

| | CHANGE IN ARTIST CONCENTRATION (1990-2000) | | | | CHANGE IN DENSITY OF ART NPOs (1990-2006) | | | |
| | (1) | | (2) | | (3) | | (4) | |
	(a) Raw Change	(b) Resid. Change	(a) Raw Change	(b) Resid. Change	(a) Raw Change	(b) Resid. Change	(a) Raw Change	(b) Resid. Change
Time Lagged Variables (1990)								
Inter-Cultural Diversity	.234 *** (.037)	.166 *** (.038)	.172 *** (.045)	.175 *** (.046)	.037 *** (.009)	.042 *** (.008)	.039 *** (.011)	.043 *** (.010)
Diversity of Ancestry	.565 *** (.052)	.018 (.039)	.470 *** (.060)	.024 (.053)	.070 *** (.010)	.032 *** (.008)	.050 *** (.015)	.022 † (.012)
Socioeconomic Disadvantage			-.174 * (.069)	-.093 (.065)			.007 (.017)	.006 (.014)
Population Density (a)			.011 (.008)	-.014 † (.008)			-.002 (.002)	-.001 (.002)
Median Rent (a)			.187 (.371)	-.842 * (.383)			.023 (.089)	-.008 (.085)
Gay Concentration	.906 *** (.128)	.169 † (.099)	.858 *** (.127)	.212 * (.100)	.017 (.029)	-.048 * (.021)	-.017 (.032)	-.069 ** (.023)
Artist Concentration	-.532 *** (.032)		-.573 *** (.035)				.022 * (.010)	.019 * (.008)
Density of Art Organizations					.022 (.033)		.012 (.033)	
Interdecade Difference Scores (1990-2000)								
Change in Inter-Cultural Diversity	-.145 † (.088)	.129 (.088)	-.207 * (.089)	.069 (.090)	-.018 (.020)	-.018 (.019)	-.007 (.021)	-.008 (.020)
Change in Diversity of Ancestry	.692 *** (.083)	.477 *** (.086)	.596 *** (.087)	.448 *** (.091)	.098 *** (.020)	.103 *** (.018)	.068 ** (.021)	.080 *** (.020)
Change in Socioec. Disadvantage			-.379 *** (.083)	-.263 ** (.087)			-.038 † (.020)	-.038 * (.019)
Change in Population Density (a)			-.029 (.021)	-.059 ** (.022)			-.006 (.005)	-.006 (.005)
Change in Median Rent (a)			.415 (.289)	-.359 (.291)			.033 (.071)	.017 (.065)
Change in Gay Concentration	.582 *** (.101)	.319 ** (.103)	.543 *** (.100)	.355 *** (.104)	.055 * (.023)	.032 (.022)	.040 (.024)	.019 (.023)
Change in Artist Concentration							.009 (.008)	.001 (.008)
Density of Starbucks Stores (b)					.160 ** (.058)	.116 * (.049)	.141 * (.060)	.088 † (.051)
Spatial Dependence (Rho)	.254 *** (.040)	.331 *** (.043)	.244 *** (.040)	.299 *** (.043)	.080 † (.048)	.069 (.048)	.052 (.048)	.046 (.048)
Intercept	.433 *** (.050)	-.008 (.035)	.238 (.185)	.459 ** (.175)	.074 *** (.011)	.006 (.008)	.060 (.044)	.002 (.038)

	CHANGE IN ARTIST CONCENTRATION (1990-2000)				CHANGE IN DENSITY OF ART NPOs (1990-2006)			
	(1)		(2)		(3)		(4)	
	(a) Raw Change	(b) Resid. Change	(a) Raw Change	(b) Resid. Change	(a) Raw Change	(b) Resid. Change	(a) Raw Change	(b) Resid. Change
R-square	.378	.235	.397	.255	.149	.140	.164	.154
Akaike Information Criterion	2256	2336	2241	2321	−153	−275	−152	−274
Log Likelihood	−1119	−1160	−1105	−1147	86	147	94	154

NOTE.-- Maximum likelihood spatial models. Standard errors in parentheses.

(a) Coefficients and standard errors are multiplied by 1000. (b) Starbucks store data was collected in 2004

*** p<.001,

** p<.01,

* p<.05,

† p<.10