

LINC



Creative Communities

Artist Data User Guide

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and
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Creative Communities ***Artist Data User Guide***

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Welcome to the *LINC Artist Data User Guide* to the Census data on artists, created for Leveraging Investments in Creativity (LINC). This manual is for use with the data sets we have provided you on your state and metropolitan region. We have constructed the tables to make your use of them as easy and transparent as possible. We are very happy to talk with you about them and help you understand any issues you have with the data and its meaning. Please feel free to contact us.

You may wonder whether 2000 Census data is good enough for what you most want to know. This data is the only evidence we have that captures artists adequately by artistic discipline, industry, income, employment status, recent migration patterns, and a large number of socioeconomic characteristics (including age, race, gender, immigrant status, education, and homeowner status), at metro and large city as well as state geographical levels. These data were first made available in the fall of 2003—the next decennial Census data will not be available until 2013. The American Community Survey now offers two years (2005 and 2006) of comparable data from a 1% sample, but this is generally too small to use reliably for studying artists at the state and local level, even when pooled across years. Although the numbers and features of artists may have changed from 2000, these data allow you to compare metro and state artists in your region with those in other places, a comparison that is not apt to have changed dramatically over the past seven years.

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I. Data Contents: Tables & Maps

You have three files for your region. One file is a set of maps, and two files are in Excel spreadsheet format (workbooks).

The first workbook allows for easy manipulation and creation of tables, charts, and graphs. The second workbook contains less-formatted data. We have tried to anticipate the main uses you might have for this data and to structure the *Guide* accordingly.

"YourRegion.xls" Workbook

Your state or metro set of summary tables is labeled "YourRegion.xls" (as in Portland.xls). It contains ten summary tables (Table 1 and Tables 3–11) for all artists in your region broken down by discipline; type of employer; industry; self-employment; gender, race, ethnicity, and immigrant status; educational attainment; recent migration; housing ownership and cost; and income. It also includes a table (Table 2) that lists the individual PUMAs (Public Use Microdata Areas) in your state or region with their estimated numbers of artists and related cultural workers and shows their shares of total employment and the extent to which they are over-represented in the region.

"YourRegion Master.xls" Workbook

A second workbook entitled "YourRegion Master.xls" (as in Portland Master.xls) contains Census data estimates broken down for all the individual PUMAs. This workbook allows you to view data at the PUMA level, as well as create subregions within your state or region. There are severe constraints on the reliability of using individual PUMA level data, since each PUMA contains between 100,000 to 200,000 residents and may have small numbers of artists in them. Because these Census data comprise a 5% sample, you need to combine them in geographic units that contain at least 1000 artists (and preferably 2000) to ensure reliability of the totals. For this procedure, we strongly advise using the information provided in the Appendix.

Maps

We also include a set of maps for your region that show the physical location of each PUMA and list by name all the localities and counties in each. Large cities contain many PUMAs, while smaller cities are combined to reach the minimum population level. PUMAs are usually (but not always) contiguous geographically. The Census Bureau has tried to make them consistent with county, municipal, or neighborhood boundaries, and they are generally organized around demographically similar areas. While PUMAs do not cross state boundaries, they do occasionally span federally-defined Metropolitan Statistical Area (MSA) boundaries, combining counties that lie within the MSA with those that do not.

Data from Other States

We can also supply you with comparable data for other states and regions, if you wish to make some comparisons of how your region stacks up. In Section II of this *Guide*, we provide examples of what is possible in this regard.

To illustrate possible uses of the data, in what follows, we use the examples of states such as Alaska, Oregon, and Hawaii; metros such as Miami, Los Angeles, Kansas City, Chicago, San Francisco-Oakland, New York, and Boston; and occasionally a city like New Orleans. For many uses, you can simply lift and use the tables that we have supplied in the first workbook. *We would appreciate your retaining the attribution to us as the source of the data.*

Note: Some of the tables used in the pages that follow have simplified contents and titles from those on your spreadsheet. You should feel free to do the same as you work with your tables.

Table 1. Artists by discipline, employment status, share of total employment, 2000

How many people are employed, including self-employed, as artists in your region? Is the presence of artists in your workforce stronger than in the US as a whole? In the first of the YourRegion tables, you will find the Census 2000 estimates of the total numbers of artists estimated for your state or metro, broken down by discipline and whether they are employed, unemployed, or not in the workforce.

This table also includes an estimate of artists' share of all employment in your region and compares this with artists' share of all US employment. Only employed artists are used to compute these ratios. In the tables that follow, we use only employed artists in our computations.

The table includes a concentration ratio, which is a measure of relative density of artists in your region compared to the US. If the ratio is 1.0, your artists comprise the same share of overall employment as they do nationally. Ratios above 1.0 show an over-representation of artists, while ratios under 1.0 show a lower than average density. It is important to note that a relatively low density rate can be accounted for by high densities of other occupations as well as relatively fewer artists. Chicago, for instance, employs large numbers of workers in blue collar occupations that other metros (New York and Los Angeles) have lost; Chicago's artistic densities may look less impressive for this reason.

Your workbooks contain data on both artists and related cultural workers, in separate totals. Artists include musicians, writers, and visual and performing artists. Related cultural workers include architects, archivists/curators/conservators, designers, other performing artists (clowns, circus performers, etc.), media/communications workers, and media equipment operators. In the first four tables of the YourRegion workbook, you will be able to compare individual artistic and cultural disciplines with each other. The main difference between the two groups of cultural workers is that artists show high propensities to be self-employed whereas related cultural workers are more apt to work for a firm and to work in the

private sector. In Tables 5-11, we confine our socio-economic analysis to the four artistic disciplines.

In our example, drawn from the Miami metro (defined as Dade County), you can see that both artists and related cultural workers are over-represented in the workforce compared to the nation. Artist densities are 17% higher than average, and related cultural workers 21% higher. Performing artists are especially prominent in the metro, followed by musicians, and among related cultural workers, architects are prominent as well.

Employed artists encompass all those who responded on the Census that artwork is their primary occupation, as measured by the number of hours they worked at it in a prior week, including the self-employed. The totals leave out part-time artists whose primary occupation is something else and undercount many artists who work informally or are people of color and immigrants.

In the following discussion of the second table in the YourRegion workbook, we explain how you can check the reliability of the data if you are looking at smaller jurisdictions where Census sampling practices might present a problem.

Table 1. Total artists, discipline, employment status, share of total employment, Miami-Dade Metro, 2000

	All artists	Visual artists	Performing artists	Musicians and composers	Writers and authors	All artists and cultural workers	
Total, all employment status	9649	3523	2453	2424	1249	28022	
In civilian labor force	7674	2856	2131	1695	992	22107	
Employed, including self-employed	7212	2762	1943	1592	915	20804	
Unemployed	462	94	188	103	77	1303	
Non-civilian labor force (e.g., military)	30	0	0	0	30	30	
Out of labor force (e.g., retired)	1945	667	322	729	227	5885	
Share of total metro employment (%)	0.8	0.3	0.2	0.2	0.1	2.2	
Share of total US employment (%)	0.6	0.3	0.1	0.1	0.1	1.8	
Concentration ratio (location quotient)	1.17	1.10	1.64	1.37	0.80	1.20	
	Related cultural workers	Architects	Archivists, curators, conservators	Designers	Other performing artists	Media and communications workers	Media equipment operators
Total, all employment status	18373	2554	116	8743	374	5345	1241
In civilian labor force	14433	2098	116	6448	198	4464	1109
Employed, including self-employed	13592	2000	116	5929	171	4267	1109
Unemployed	841	98	0	519	27	197	0
Non-civilian labor force (e.g., military)	0	0	0	0	0	0	0
Out of labor force (e.g., retired)	3940	456	0	2295	176	881	132
Share of total metro employment (%)	1.4	0.2	0.0	0.6	0.0	0.4	0.1
Share of total US employment (%)	1.2	0.1	0.0	0.6	0.0	0.3	0.1
Concentration ratio (location quotient)	1.21	1.41	0.45	1.12	0.68	1.30	1.57

Note: Miami-Dade Metro definition also includes Monroe County.

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

Table 2. Employed artists by jurisdiction, 2000

In general, artists are more apt to live in larger cities than in smaller towns and rural areas. Within metros, they are more apt to live in the central cities than in the further-out suburbs. How are artists distributed by subunit within your state or metro? This table breaks your state or metro down into PUMA subunits. We include a map for your region, from the PUMS website, that identifies the geographical units in each PUMA, the units of 100,000 to 200,000 residential population that the Census uses for reporting. The table gives you the Census estimates for the totals of artists and related cultural workers for each PUMA, their shares of total regional employment, and an index that shows whether they are above (over 100) or below (under 100) the regional average.

In our simplified example, for Alaska, you can see that the state is broken up into five PUMAs, two of which encompass the largest city, Anchorage. Anchorage hosts above-average shares of artists compared with the state as a whole, and so does the PUMA that contains Fairbanks. The other, more rural, areas of the state are below average, common across states.

From the Master workbook, you can construct tables for subunits of your region, if the numbers are large enough. If the totals are above 1000 for your state, metro, or any PUMS unit within these, you can be confident that Census estimates are good enough to use subsequent breakdowns of, for instance, age, gender, education, and income. If not, you should use only the larger units. In our Alaska example, look closely at the number of employed artists by jurisdiction. For Alaska as a whole, a small state population-wise, the Census estimates 1548 employed artists (Table 2, last row). You can work at the state level, therefore, and feel fairly confident of the estimates in Tables 5 through 11, except in cases where you have small subgroups (e.g., minorities). But the Anchorage PUMA artist totals are too small to break down by gender, age, education, and so on. You can put the two Anchorage PUMAs together, and it is still shy of the norm. But you can add artists and related cultural workers together for the two, and you have an ample total of 2137. You would then have enough artists, totaling the two

Anchorage PUMAs, to be confident that the city does indeed have higher than average concentrations of artists and cultural workers. [See the statistical appendix for more precise guidelines.]

Table 2. Employed artists, Alaska, place of residence (PUMA), 2000

PUMA	County/Major cities	Artists	Related cultural	% of state average		
				Artists	Related cultural	Artists and cultural
101	Anchorage Municipality (part)	296	670	105	139	126
102	Anchorage Municipality (part)	394	777	98	113	108
200	Kenai Peninsula Borough, Matanuska-Susitna Borough	286	234	114	55	76
300	Denali Borough, Fairbanks North Star Borough, Haines Borough, Juneau City and Borough, Ketchikan Gateway Borough, Sitka City and Borough, Southeast Fairbanks Census Area, Valdez-Cordova Census Area	431	803	109	118	115
400	Aleutians East Borough, Aleutians West Census Area, Bethel Census Area, Bristol Bay Borough, Dillingham Census Area, Kodiak Island Borough, Lake and Peninsula Borough, Nome Census Area, North Slope Borough, Northwest Arctic Borough, Prince of Wales-Out	141	166	65	44	52
Total		1548	2650	100	100	100

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

Table 3. Employed artists by discipline, top industry sectors, 2000

The presence of artists in your state or metro is in part a function of the industries that employ them. In turn, employers in certain industries will be attracted to your region because of the artistic workforce available. In the YourRegion workbook Table 3 shows you the distribution of artists by discipline by industry for your region. For each discipline, the table lists the top five employing industries, which together usually account for 80% of employed artists. For comparison purposes, we also list the national distributions of that discipline by industry.

You will notice immediately that for every artistic discipline, the industry entitled “independent artists, performing artists, spectator sports, and related” is the largest “industry.” This odd group picks up the high shares of independent artists in your region but also the nonprofit performing arts organizations that employ artists, either directly or on contract.

Our example, for the Los Angeles metro, shows the extraordinary significance of the motion picture and video industries as generators of artists’ livelihoods. More than 19% of the metro’s visual artists, including filmmakers, work for this industry, compared with under 3% nationally. The same is true for the region’s performing artists and writers. Los Angeles area musicians are much more apt to work independently than they are nationally, and larger shares of them work for sound recording industries as well as motion pictures and video.

This example also reveals the care you must take in interpreting low shares. Look at Los Angeles’ low share of musicians who work for religious organizations, for instance. This share does not necessarily mean that Los Angeles is irreligious or has fewer absolute numbers of musicians working for religious organizations. The Los Angeles area has three times the share of artists in its workforce as the nation does. The share listed in the table reflects the huge numbers of musicians working in the cultural industries, not a dearth of church and synagogue musicians. In contrast, many metros and states without a sizeable cultural industry or lively music scene will exhibit very high shares of musicians

working for religious organizations, about one in three, or even higher.

Table 3 data are useful for understanding the industry distribution of artists in your region and where you have sizeable concentrations that differ from the national norm. If you were to view the Chicago metro data, for instance, you would find high concentrations of visual and performing artists, and even writers, in that region’s advertising industry.

Table 3. Employed artists, Los Angeles Metro, discipline, top industry sectors, 2000

	% of occupational employment	
	Los Angeles	United States
Visual artists		
Independent artists, performing arts, spectator sports, and related	24.0	27.1
Motion pictures and video industries	19.6	2.7
Other professional, scientific and technical services	13.9	19.6
Specialized design services	6.1	6.0
Advertising and related services	4.2	5.1
% of occupation in top 5 industries	67.8	
Performing artists		
Motion pictures and video industries	48.7	20.0
Independent artists, performing arts, spectator sports, and related	22.5	21.3
Radio and television broadcasting and cable	15.6	27.5
Employment services	3.5	0.7
Advertising and related services	1.3	3.2
% of occupation in top 5 industries	91.6	
Musicians and composers		
Independent artists, performing arts, spectator sports, and related	64.9	46.8
Religious organizations	9.8	32.5
Sound recording industries	7.2	3.2
Restaurants and other food services	3.8	2.7
Motion pictures and video industries	2.7	0.9
% of occupation in top 5 industries	88.4	
Writers and authors		
Independent artists, performing arts, spectator sports, and related	45.3	35.8
Motion pictures and video industries	20.0	3.1
Radio and television broadcasting and cable	6.6	3.0
Publishing, except newspapers and software	6.1	7.9
Advertising and related services	4.1	9.5
% of occupation in top 5 industries	82.1	

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

Table 4. Employed artists by self-employment and employer status, 2000

How many artists are self-employed in your region? How many of them are working for private employers, nonprofits, or public agencies? Table 4 enables you to see this for your region as well as the nation. It includes self-employment rates for individual artistic disciplines as well.

In our simplified example, for the state of Oregon, you can see that artists are 30% more likely to be self-employed than are artists

nationally. Writers and visual artists account for the largest share of the gap—performing artists’ self-employment rates mirror the nation’s. (Writing and visual art are the more individualistic art forms, generally more widely dispersed between urban and rural regions within states and across the nation.) Oregon’s artists are less apt, by a similar margin, to work for private sector employers. They are slightly under-employed in nonprofits, but show higher concentrations in public employment.

Table 4. Employed artists, Oregon, self-employment, employer status, 2000

	Oregon	United States
Self-employment status	Artists (%)	Artists (%)
Self-employed, unincorporated	43.1	33.2
Self-employed, incorporated	4.8	6.6
Wage and salary, private employer	33.4	42.2
Wage and salary, nonprofit	11.9	13.3
Wage and salary, public	6.0	4.3
Unpaid family worker	0.7	0.4
Self-employed by arts discipline	Self-employed (%)	Self-employed (%)
Visual artists	57.6	49.1
Performing artists	19.2	19.5
Musicians and composers	38.7	34.7
Writers and authors	57.6	48.7

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

Table 5. Employed artists by age and gender, 2000

Artists often flock to major centers of artistic ferment at young ages, especially post-schooling, but return home or seek an easier and less expensive living environment in later years. How does the age profile of artists in your region measure up? Men account for greater than 55% of artists in the disciplines of performance, music, and visual art, and just under 50% among writers nationally. How does your region match up to these profiles? Your Table 5 gives you these breakdowns for core artists.

nation (Table 5). The state has a higher than average presence of artists in the schooling age group, 16–24, than does the nation or the entire workforce in the state. However, Hawaii has a noticeably lower distribution of artists in the age group 25–34 than does the nation, suggesting an out-migration to the mainland and perhaps other countries in career development stages. Artists in the 45+ cohorts are over-represented. For women artists, Hawaii is a very tough place for musicians but a surprisingly good place for performing artists, compared with the nation.

We show the profile for Hawaii compared to the

Table 5. Employed artists, State of Hawaii, age, gender, 2000

Age	Hawaii		United States	
	Artists (%)	All employed (%)	Artists (%)	All employed (%)
16–24	13.0	12.5	10.4	14.5
25–34	18.5	20.4	23.5	22.5
35–44	26.0	26.9	27.2	27.0
45–54	25.0	24.6	22.8	22.2
55–64	9.6	11.5	10.2	10.4
65 and over	8.0	4.1	6.0	3.4
Totals	100.0	100.0	100.0	100.0

Gender	Artists (%)	All employed (%)	Artists (%)	All employed (%)
Male	58.6	51.4	56.3	53.3
Female	41.4	48.6	43.7	46.7
Totals	100.0	100.0	100.0	100.0

Gender by arts discipline	Male (%)	Female (%)	Male (%)	Female (%)
Visual artists	55.0	45.0	56.2	43.8
Performing artists	48.7	51.3	57.1	42.9
Musicians and composers	88.2	11.8	62.7	37.3
Writers and authors	46.6	53.4	48.6	51.4

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

Table 6. Employed artists by race/ethnicity and citizenship status, 2000

How do minority artists and those who are not citizens fare in the arts workplaces of your region? Nationwide, African-Americans and Hispanics (the Census usage) account for a much smaller share of artists than their presence in the workforce—almost 50% in both cases. Asians are under-represented by a third. How do these groups fare in your economy? Table 6 enables you to answer these questions.

In our example, the City of New Orleans, you can see that African-American artists are twice as prominent as they are nationally (Table 6). But given that African-Americans make up (or

did in 2000) 58% of the workforce, they are woefully under-represented among the ranks of artists compared to the nation. Interestingly, multiracial workers—the growing category that captures people with two or more identities—are more prominent as artists than they are in the workforce in New Orleans. Although we do not show it in this example, your Table 6 will also enable you to note the presence of non-citizens (a group under-represented nationally in the arts) in your artistic workforce and compare this group with citizens and other workers in the region and nationally.

Table 6. Employed artists, New Orleans City, race/ethnicity, citizenship, 2000

Race/ethnicity	New Orleans City		United States	
	Artists (%)	All employed (%)	Artists (%)	All employed (%)
White, non-Hispanic	80.8	35.4	83.9	73.8
Black or African-American, non-Hispanic	12.8	57.6	5.2	9.9
Hispanic, all races	2.3	3.4	5.4	10.3
Asian, non-Hispanic	1.7	2.1	2.8	3.7
Other races, including multiracial	2.5	1.3	2.7	2.4
Totals	100.0	100.0	100.0	100.0

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

Table 7. Employed artists by educational attainment, 2000

In the US as a whole, an amazing 55% of employed artists hold a bachelor’s degree or higher, compared with just 27% of all workers. How does your region stack up to this skewed distribution? Table 7 enables you to compare artists’ educational attainment with all workers in your region and with artists nationally.

In our example of the Kansas City metro, we find that a very large share of artists hold bachelors as their terminal degree, 44% compared with 21% of all Kansas City metro workers and 39% nationally, though fewer Kansas City artists hold masters degrees than do

artists nationally. The metro has lower shares of artists with high school and below levels of educational attainment than in its region-wide workforce as a whole or than among the nation's employed artists. Kansas City has extraordinarily high shares of visual artists, 20% higher than the national norm, and many of them work for the printing and publishing industries, in a city that hosts Hallmark Cards (from that metro’s Table 5). Hallmark and other publishers may hire more college graduates as a share of their artistic workforce, explaining in part the high share of college graduates.

Table 7. Employed artist, Kansas City Metro, educational attainment, 2000

Educational attainment	Kansas City Metro		United States	
	Artists (%)	All employed (%)	Artists (%)	All employed (%)
Less than high school	3.8	11.2	4.3	14.4
High school or equivalent	8.0	25.0	11.4	26.7
Some college	22.5	26.0	23.1	24.3
Associates degree	8.7	6.3	6.6	7.3
Bachelors degree	44.2	21.2	38.6	17.7
Masters degree or higher	12.8	10.2	15.9	9.7
Totals	100.0	100.0	100.0	100.0

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

Table 8. Employed artists by top industries and race/ethnicity, 2000

Many artists, even when self-employed, work predominantly in one industry or another, as we explored in Table 3. How do artists overall, summing among disciplines, sort out by industry in your region? Are there racial differences in these patterns? Table 8 enables you to answer these questions.

In our example, for the San Francisco-Oakland metro area, we see that in addition to self-employment and performing arts sectors, the motion picture industry, advertising, professional services, and media broadcasting are sectors where employment by artists in the region is concentrated. White, non-Hispanic artists account for as much as 95% of artists in some of the metro's industries (information services) and as low as 72% in others (professional, scientific, and technical services). From Table 4 for this metro, we know that overall white artists account for 79% of the artists employed in the region, a share that is lower than New York City (82%) but higher than in the Los Angeles metro (74%).

Asian artists, who account for 7% of the region's employed artists (from Table 4), are more concentrated in professional services, advertising, specialized design services, and motion picture industries than other minority groups. Hispanic artists (6% of the artistic labor force) are more concentrated in broadcasting and colleges than other artists, while African-American artists (3.5%) are more concentrated in colleges and specialized design services.

In using this table, you must be careful about sampling error. In the case of San Francisco-Oakland with its more than 25,000 working artists, there are enough Asian artists (1800) to feel confident that we can trust their estimated distribution by industry. This is true for Hispanic artists as well. But the Census estimate of 825 African-American artists, computed by multiplying their share of employed artists from Table 4 by the total of all employed artists from Table 1, is not large enough for us to feel confident of the distributions in Table 8. For this reason, for smaller metros and for smaller racial/ethnic groups, you should not place great stock in the distributions in this table.

Table 8. Employed artists, top industries, race/ethnicity, San Francisco-Oakland Metro, 2000

Industry	% of total arts employment	Race/ethnicity of artists in industry					Total
		WnH	Black	Hisp	Asian	Other	
Independent artists, performing arts, spectator sports	32.6	80	4	5	5	5	100
Motion pictures and video industries	9.3	82	3	4	8	3	100
Advertising and related services	7.0	82	3	5	10	0	100
Other professional, scientific, technical services	6.6	72	2	5	15	5	100
Radio and television broadcasting and cable	4.8	77	4	10	8	0	100
Publishing, except newspapers and software	3.6	88	0	4	5	4	100
Other information services	3.1	95	0	2	3	0	100
Specialized design services	2.9	84	5	0	9	2	100
Religious organizations	2.6	89	3	3	3	2	100
Colleges and universities, including junior colleges	2.4	84	7	9	0	0	100
Total, all industries	100						100

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

Codes: WnH = White, non-Hispanic; Black = Black or African-American, non-Hispanic; Hisp = Hispanic, all races; Asian = Asian, non-Hispanic; Other = Other races, including multiracial

Table 9. Artists in the workforce by migration status, 2000

Artists often move from one city to another, more than members of most other occupations. From 1995-2000, 23% of artists in the workforce nationally moved into a metropolitan area where they had not been at the beginning of the period, compared with 16% of all members of the workforce. Sometimes these moves are connected to career-building. In general, younger artists, especially post-training, move from rural areas and smaller cities to larger ones, with a reverse migration mid-career and after retirement. This means that the resident artistic workforce in some regions contains more new residents in some regions than in others. Is your region or state a net recipient of artists or a net exporter? Table 9 enables you to answer this question for the latter half of the 1990s and to gauge the degree of turnover among artists in your region.

In the Chicago metro, our example, a smaller percentage of artists moved into the region over this period than was true nationally. At the same time, more artists moved into the Chicago metro than did non-artists in the workforce, so that the low in-migration rate is chiefly a function of relatively low growth rates of the Chicago metro overall. Chicago gained almost 4400 artists over the period but lost almost 5300 other artists to out-migration. Its net migration rate was thus 0.83, or less than the 1.0 it would need to keep Chicago's net migration rate on even keel. The metro could still have increased its numbers of artists substantially, but by generating more artists from within its own population rather than attracting them from elsewhere. Only 16% of the Chicago metro's artists were newly in the region in 2000—the rest were there in 1995.

How can a state or region put these migration numbers in context? One way is to compare them with other regions. The Los Angeles metro, for instance, was the greatest magnet for artists in the period—its migration ratio of 2.16 indicates that more than two artists arrived for every one that left. New artists comprise 22% of the Los Angeles artistic workforce compared with Chicago's 16%. On the other hand, for its size, Chicago attracted more artists than Detroit, a metro that lost almost two artists for every one it gained and whose artistic workforce hosted

very low shares of recent arrivals. Compared to fast-growing large metros that drew in large numbers of new residents across the board, Chicago still attracted many more artists from elsewhere in absolute terms than most metros—4380 compared with Houston's 2010, for instance.

Table 9. Employed artists, migration status, Chicago metro, 2000

Migration status, 5 years ago	Chicago		United States	
	Artists (%)	All employed (%)	Artists (%)	All employed (%)
Lived in same house	46.2	52.5	47.3	50.8
Moved within metropolitan area	37.9	35.3	30.9	33.3
Moved into metropolitan area	15.9	12.3	22.7	15.9
Totals	100.0	100.0	100.0	100.0
Net migration, total arts labor force*				
In-migrants (lived elsewhere in 1995)	4,379			
Out-migrants (moved from MSA 1995–2000)	5,288			
Migration ratio	0.83			
New artists as % of total	16%			

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

*includes both employed and unemployed individuals.

Table 10. Employed artists by housing characteristics, 2000

In the US as a whole, artists are modestly less apt to own their own homes than workers as a whole and more apt to be renters or live in group quarters. Their mortgage costs, on average, are a higher share of their incomes than for non-artists, and the same is true for rents. How do the housing circumstances of artists in your region stack up to the national profile? Table 10 enables you to answer this question. Some state and metro tables contain only the home-ownership figures and not housing cost estimates.

In our example, in the New York metro, artists are much less likely to own their own home, and the gap between them and their non-arts neighbors is even higher than nationally (Table 10). Whereas almost two-thirds of artists own their own homes country-wide, a little more than one-third do so in the New York metro. New York metro artists pay almost the same shares of their incomes in rent as do employed artists nationally, but a higher share than non-artists in the metro, perhaps because they need more space to work at home.

Table 10. Employed artists, housing characteristics, New York City Metro, 2000

Housing status	New York		United States	
	Artists (%)	All employed (%)	Artists (%)	All employed (%)
Homeowner	38.4	45.8	64.4	70.0
Renter	61.0	53.5	34.6	29.2
Group quarters (e.g., dormitory)	0.6	0.6	1.0	0.8
Totals	100.0	100.0	100.0	100.0
Total mortgage cost* as % of household income (homeowners)				
	Artists (%)	All employed (%)	Artists (%)	All employed (%)
50% or more of household income	10.8	11.0	7.5	4.9
40–49%	5.4	6.3	4.4	3.6
30–39%	11.6	12.2	10.0	9.2
20–29%	18.5	21.7	24.8	23.7
10–19%	28.4	28.0	32.8	36.5
Less than 10%	25.3	20.8	20.5	22.1
Totals	100.0	100.0	100.0	100.0
Gross rent** as % of household income (renters)				
	Artists (%)	All employed (%)	Artists (%)	All employed (%)
50% or more of household income	13.5	11.2	15.0	10.0
40–49%	6.6	5.2	5.9	5.1
30–39%	11.2	10.3	10.6	10.6
20–29%	21.7	21.8	24.0	23.3
10–19%	30.3	33.9	30.6	35.7
Less than 10%	16.7	17.7	13.8	15.3
Totals	100.0	100.0	100.0	100.0

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

*Total mortgage cost includes (first) mortgage payment; property taxes, property insurance, related fees (e.g., condominium), and utilities; figures do not include second mortgages.

**Gross rent includes contract rent amount plus utilities.

Table 11. Employed artists by income characteristics, 2000

Nationally, artists report modestly higher personal incomes than in the workforce as a whole, though portions of this income may come from non-arts sources. Artists are more apt to live in families that are below the poverty line, but because the distribution of family income is more uneven among artists, a higher share of them are in high income groups than workers in general. How do artists' incomes and poverty status stack up in your metro or state? Do they live in families whose incomes are higher than the average in the region or nation? Table 11 enables you to answer these questions. You should keep in mind that artists have considerably higher levels of educational attainment (Table 7) than the general workforce and are thus on average relatively underpaid for their qualifications.

Our example is drawn from the Boston metro data (Table 11). It shows that artists in families are almost twice as likely to be below the poverty line than Boston area workers overall and only slightly below the nation. These figures underestimate poverty rates, however, because the cost of living in the Boston metro is considerably higher than in the nation as a whole, probably on the order of 20 to 30%. The Census does not adjust these rates for cost-of-living differentials. Boston metro artists have higher median personal incomes than their national counterparts, enough to compensate for much of the cost of living differential. But Boston metro artists' family income medians do not similarly exceed the national norm, perhaps because more of them are younger and live alone. By discipline, the personal income premium for living in the Boston metro is comparable for writers and visual and performing artists—they make more than their counterparts nationally, though the cost of living is higher, too. Boston's musicians, however, do not enjoy this premium, so that when the cost-of-living figures are taken into account, their real incomes are lower than nationally.

Table 11. Employed artists, income characteristics, Boston Metro, 2000

Family income as % of poverty line	Boston		United States	
	Artists (%)	All employed (%)	Artists (%)	All employed (%)
500% or more	50.6	51.9	43.6	35.4
400–499%	13.5	13.5	12.4	13.5
300–399%	12.0	13.6	13.5	16.0
200–299%	8.9	10.6	13.0	16.2
100–199%	8.0	6.8	9.6	12.5
Less than 100%	7.0	3.6	7.8	6.4
	Totals	100.0	100.0	100.0
Median personal income	\$34,260	\$34,500	\$28,440	\$26,900
Median family income	\$61,200	\$70,100	\$56,000	\$54,000
Median household income	\$78,000	\$77,500	\$63,000	\$58,000
Personal income by arts discipline	Boston		United States	
Visual artists	\$30,000		\$25,000	
Performing artists	\$40,920		\$36,300	
Musicians and composers	\$20,000		\$20,400	
Writers and authors	\$39,900		\$34,900	

Source: Ann Markusen, Greg Schrock, Anne Gadwa, and Sara Thompson. Markusen Economic Research Services. 2006. Estimates using 2000 decennial population Census data from Steven Ruggles and Matthew Sobek *et al.*, Integrated Public Use Microdata Series: Version 3.0. Minneapolis: Historical Census Projects. University of Minnesota, 2003.

II. Uses of the Data for Educational, Policy, & Advocacy Purposes

You can use these data, along with other types you may have, to educate people about your artistic workforce. Artists, in particular, are often thrilled to see themselves in numbers and to see how they compare with other workers and artists elsewhere. They often feel so invisible. The data are useful in crafting policies that address funding and services for artists such as housing, health care, and public arts grants. They are also useful for helping your state and local leaders, including arts organization managers, politicians, and cultural affairs, planning, and economic and community development staff design creative city and cultural industry policies. Advocacy groups will find them useful for underscoring the over- or under-representation of artists in your region and showcasing the disciplinary and arts industry specializations in the regional economy. The data can be used to build support for arts education and targeted infrastructure, workforce development, and industrial policies.

In this section, we briefly summarize a number of uses to which our data have been put by ourselves and others, showing the diverse settings in which they have been harnessed to explore specific policies and plans for cities and states. Many of these efforts can be replicated in your city, metro, or state.

Making the case for artists' health insurance: Washington Artists Health Insurance Project

The Washington Artists Health Insurance Project (WAHIP), a joint initiative between LINC and Artist Trust in Seattle, Washington, working with Claudia Bach (AdvisArts Consulting), began using the Arts Economy Initiative (AEI) data to build a baseline for a range of related policy and advocacy purposes in Washington State in 2004 in a project that is continuing. The data, presented by Ann Markusen to numerous Seattle area arts representatives in 2004, framed the issues and provided the set of questions needed for developing an approach to expanding access to health coverage for artists in the state. A subsequent WAHIP report, *Artists and Health*

Insurance: Existing Data and Implications for the Washington Artists Health Insurance Project (Minifie and Bach, 2005) synthesized all available Washington State data on the state's artist population and their health care status, including the AEI data. The follow-up, *WAHIP 2005 Survey Report of Artists and Arts Workers* (Tarnai, 2005), summarized the responses of 1400 full- and part-time Washington State artists and arts workers in every discipline, a group whose composition was closely aligned with the AEI Census estimates. A third publication, *Steps You Can Take in Your Community Towards Expanding Health Coverage for Artists* (Bach, 2006), is designed to assist other states and communities make the case for state-level health insurance. The work continues with an update of the data work in 2007 for King County, Washington.

Contact: Claudia Bach (AdvisArts Consulting, Seattle), claudia@advisarts.com or Fidelma McGinn (Artist Trust), Fidelma@artisttrust.org

Developing financial resources to support artists and arts organizations in the prairie states

Jerry Yoshitomi, for MeaningMatters, presented the LINC/AEI data in 2006 at state conferences sponsored by the Federal Home Loan Bank of Des Moines, with the intention of strategizing new provision of financial resources for artists in the states of Iowa, South Dakota, North Dakota, Minnesota, and Missouri. In a series of talks in each state, Yoshitomi enabled bankers, elected officials, economic development professionals, and chamber of commerce representatives to understand the depth and character of artistic pools in their states. The LINC/AEI data helped users see the types of artists in their states, as well as age, gender, income, migration, location, and other socio-economic characteristics of the artists. One key strategy discussed was encouraging return (or other) migration to rural areas of these states buoyed by the availability of low cost (relative to urban areas) housing.

Contact: Jerry Yoshitomi (MeaningMatters), YshJy@aol.com

Crossover: How California artists blend nonprofit, commercial, and community work

In 2005–6, Ann Markusen and her team at Arts Economy Initiative (AEI) at the University of Minnesota used the Census PUMS data on artists in the Los Angeles and Bay Area metros to explore “crossover” in a study for the William and Flora Hewlett Foundation, James Irvine Foundation, and Leveraging Investments in Creativity. They used the data to map the density of artists and employment status (percent self-employed) by neighborhood below the metro level and to show that performing artists tend to live closer to the centers of the metros while visual artists live farther out (Markusen *et al.*, 2006: Figures 1–4). They constructed a comparison of artists' socioeconomic and industry profiles in four metros (Los Angeles, San Jose, San Francisco-Oakland, and Santa Rosa-Vallejo) and compared these to the US as a whole. They also used them to assess whether the more than 2000 artists who responded to a web-based survey were representative of artists as reported by the Census. Among other things, they reached more artists of color with the survey than the Census (under-)reported. More visual artists responded than in the Census profile, and somewhat fewer performing artists, writers, and musicians. These baseline data enabled them to interpret the survey findings. They found, for instance, that Los Angeles and San Jose artists had greater commercial artistic income earning options, consistent with Census data showing that they are more apt to work for private sector employers and in certain industries like motion pictures and video production.

www.hhh.umn.edu/projects/prie/crossover.html

Home-growing artists: The impact of Minnesota's artists' centers

To document the contribution of the state's dedicated artistic spaces to the size and economic impact of the artistic workforce, Ann Markusen and her Minnesota team used the AEI's Census data in a project funded by the McKnight Foundation and Markusen's Fesler-Lampert Chair from 2004–6. They used the data to show that the state's major metro area, Minneapolis-St. Paul, hosts a greater density of artists than the nation as a whole and most other

metros of its size (Markusen and Johnson, 2006). Yet the region is a net loser of artists to out-migration, as young people leave for the super-arts cities of New York, Los Angeles, and San Francisco. They concluded that the rapid growth of artists in the region and continued pre-eminence of the artistic labor pool can be attributed in large part to the artists' centers and to generous funding on the part of the state's large regional family foundations. They also used the data to show that some other regions in the state are attractive living and working environments for older artists and for visual artists and writers in particular. They argued, on the basis of the data, that the state enjoys a cross-fertilization of artists moving from smaller towns to larger cities at younger ages and then returning later and that a similar churning of artists among large arts-rich cities also improves the quality of the state's cultural talent and range and quality of arts and cultural offerings.

www.hhh.umn.edu/projects/prie/artists_centers.html

The status of artists in Kansas City

In 2007, the Arts Council of Metropolitan Kansas City and Charlotte Street Foundation commissioned a study by University of Missouri-Kansas City Professor of Planning Michael Frisch to explore the LINC/AEI data for a detailed profile of city, county, and metro artists. The study shows that artists in the Kansas City region, especially visual artists, are more likely to be employed in the private sector and are more likely to be married and live in a single family home than artists nationally. Visual artists are over-represented in the region, while other artistic disciplines are under-represented. Kansas City metro artists are less likely to be self-employed and, as with other second-tier cities, lose substantial numbers of artists in the youngest age group to out-migration, although the region attracts career artists in younger age cohorts than most other metros (Frisch and Bohrer, 2008). The Arts Council and Charlotte Street plan to use this work to design initiatives to support artists that play to the region's strengths and target gaps. Recommendations include entrepreneurial and professional training opportunities to aid and encourage the self-employed; an artist-centric website and regular meetings to improve access to information and networking; awards to

performing artists for financial support, recognition and validation; and a collaborative effort to promote the collecting of visual art to stimulate market demand.

Contacts: Paul Tyler (Arts Council of Metropolitan Kansas City), Tyler@ArtsKC.org; David Hughes (Charlotte Street Foundation), David@CharlotteStreet.org; and Michael Frisch (Department of Architecture, Urban Planning and Design), frischm@umkc.edu

**The artistic dividend:
Comparing artists across US metros**

In this published paper in an international journal, Markusen and Schrock (2006) of the University of Minnesota's Arts Economy Initiative make the case for artists' contributions to the creative economy using the density of artists in metropolitan labor markets to compare their relative concentrations, net migration rates, and other characteristics across the 29 largest US metro areas.

www.hhh.umn.edu/projects/prie/aei_pubs.html

**Defining creative industries
and creative occupations:
A Boston case study**

In this published paper, Markusen teams up with Greg Wassall and Doug DeNatale of the New England Creative Economy project and Randy Cohen of Americans for the Arts to examine the conceptual underpinnings for designating industries and occupations as "creative." They compare, using the Boston metro area as a test bed, how estimates of creative employment vary with the definitions in the authors' three policy-oriented projects and also Richard Florida's (2002) creative class measures. They make the case for flexibly nested definitions of cultural industries and occupations based on user needs (Markusen *et al.*, 2008).

www.hhh.umn.edu/projects/prie/aei_pubs.html

Other uses

Building artists into cultural and social indicators for the King County (Washington) study, *Communities Count*, with help from the Urban Institute's Arts and Cultural Data Project, 2005.

Contact: Molly McNees,
Molly.McNees@kingcounty.gov
www.communitiescount.org/Cc2005g_ArtsCulture.pdf

Cultural Impact Study, Houston, 2005–6. Used by Arthur Greenberg, AMS Planning Consultants, St. Louis, for their work on the Houston impact study.

Contact: Arthur Greenberg,
agreenberg@ams-online.com

Designing and implementing a strategy to enhance facilities for artists and small arts organizations in Philadelphia, 2007. AEA Consulting, based in New York, used the LINC/AEI data to help the William Penn Foundation in this Philadelphia project.

Contact: Holly Sidford,
hsidford@aeaconsulting.com
www.aeaconsulting.com

Developing a baseline for a survey of San Jose, California, artists to design housing and support services, including entrepreneurial training, for the City of San Jose, in conjunction with California's Center for Cultural Innovation, 2008.

Contacts: Lawrence Thoo (City of San Jose),
lawrence.thoo@sanjoseca.gov and Cora
Mirikitani (CCI), cora@cciarts.org

III. Appendix—Technical & Statistical

About the data source

Arts employment data presented in this analysis are derived primarily from the US Census Bureau's decennial Population Census, most recently conducted in 2000. The data come from the "long form" component of the Census, which is administered to roughly one in six households. Unlike many other sources of employment information, the Population Census collects information from households, where the primary units of analysis are *workers* reported on the basis of residence rather than business establishments, where the primary units are *jobs* reported on the basis of place of work. This allows for industrial and occupational information to be linked with person- and household-level demographic information such as gender, race/ethnicity, age, and educational attainment. It also allows for broader coverage of individuals located outside of traditional business establishments, including self-employed and unemployed workers. The primary drawback to Population Census data is timing; detailed data for 2000 were only just released in 2003 and will become quickly dated relative to other, more timely data sources. However, in addition to offering the most comprehensive point-in-time view of the US population and the economy, the Population Census is the preferred tool for longitudinal analysis, despite ongoing changes in data classification systems that hinder comparisons over time.

We produced the data from the Census Bureau's Public Use Microdata Sample (PUMS) release, accessible through the Integrated Public Use Microdata Series (IPUMS) at the Minnesota Population Center, University of Minnesota. PUMS files allow researchers to create customized tabulations based on an anonymous sample of long form respondents equivalent to approximately one in 20 households (5%). The IPUMS interface brings together PUMS files from Census years dating back to the 19th century into a convenient, user-friendly internet portal.

Geographic coding

The lowest level of geographic disaggregation available in the PUMS/IPUMS 5% data file is referred to as the Public Use Microdata Area (PUMA). PUMAs are areas of approximately 100,000 to 200,000 population, which are usually contiguous geographically, often consistent with county, municipal or neighborhood boundaries, and generally organized around demographically similar areas. Each PUMA belongs to a single Super-PUMA, areas of approximately 400,000–500,000 population that are the lowest geographic unit in the PUMS/IPUMS 1% data file. The Census Bureau uses the PUMA system to ensure statistical reliability and confidentiality, since the records included in the files are those of actual long form respondents.

While PUMAs do not cross state boundaries, they do occasionally span federally-defined Metropolitan Statistical Area (MSA) boundaries, combining counties that lie within the MSA with those that do not. For example, DeKalb County, IL, one of the outermost counties in the Chicago Primary Metropolitan Statistical Area (PMSA), is part of the PUMA that also includes a nonmetropolitan county (Lee). For this reason, data from this PUMA cannot be included in the overall totals for the Chicago metropolitan area. However, because the areas affected by this nondisclosure are typically small relative to the overall MSA in terms of population,¹ their absence from metropolitan totals should not significantly bias the estimates.

For each LINC Creative Community, a PUMA guide with maps and detailed contents has been produced. This file allows local users to determine with greater precision the areas represented by particular PUMAs. This is particularly necessary for large cities such as Los Angeles, Chicago, and New York City, which are comprised of numerous PUMAs. The Census Bureau does not provide descriptive information about the area included (e.g., neighborhood, street boundaries), making it virtually impossible for someone without local knowledge to complete this task. It does provide

the Census tracts which comprise the PUMA, permitting identification using tract boundaries.

Definition of artist subgroups

In this report we have defined “artists” as encompassing seven occupational titles in four categories used in reporting 2000 Census data, shown in the top portion of Table A.1. We have defined “related cultural workers” as the ten additional occupational titles arrayed in the bottom of the table. For both groups, we include notes on the types of workers included in each.

Using the Master data file

For each LINC Creative Community, a Master data file has been created with data for most of the variables available,² disaggregated at the PUMA level. This allows users to create customized tabulations for different geographies (e.g., counties, cities) by aggregating PUMA-

level data together.

It is important, however, to recognize and understand the statistical limitations of the dataset when assembling PUMA-level data. Like any survey-based dataset, estimates derived from PUMS/IPUMS data are subject to sampling errors based on the number of survey observations relative to the survey population. The more observations, the lower the sampling error, and thus the more reliable the estimates can be considered.

The key concepts to understand in this regard are *standard error* and *confidence interval*. The standard error is the amount of expected variance around a given survey statistic, based on the assumption that a series of survey-generated statistics will cluster around the “real” population statistic in a normal, bell curve manner. For example, if our survey data

Table A.1. Artist and related cultural workers defined, Census Codes, 2000

Artists	Census occupation(s) and code(s)	Notes
Visual artists	Artists, related workers [260] Photographers [291]	Includes art directors, craft artists, painters, sculptors, illustrators and multi-media artists
Performing artists	Actors [270] Producers and directors [271] Dancers, choreographers [274]	
Musicians and composers	[275]	
Writers and authors	[285]	Does not include technical writers and editors
Related Cultural Workers		
Architects	[130]	Includes landscape and other architects but not naval
Archivists, curators, conservators	[240]	
Designers	[263]	Includes commercial, fashion, floral, graphic, industrial, interior and set designers
Other performing artists	[276]	Includes acrobats, clowns, comedians, fortune tellers, magicians, puppeteers, storytellers
Media/communications workers	Announcers, disk jockeys [280] News analysts, reporters, and correspondents [281] Editors [283] Technical writers [284] Other media workers [286]	“Other” includes Braille and other translators, interpreters, stage technicians
Media equipment operators	[290]	

indicated that 2000 out of 4000 artists (50%) in a given metropolitan area were women, with a standard error of 136, we would expect that 68% of subsequent surveys would show the number of women artists to fall between 1864 (2000 – 136) and 2136 (2000 + 136). The actual standard error³ is calculated as:

$$SE = \sqrt{\left(\frac{1}{sr} - 1\right) * n * \left(1 - \frac{n}{N}\right)}$$

where *sr* is the sampling rate of the survey (5% in this case), *n* is the subpopulation for which the statistic is being calculated (e.g., women artists), and *N* is the total base population (e.g., total artists).

Confidence intervals translate the standard error into a percentage margin of error around the survey-generated statistic. This is done by simply dividing the standard error by the total base population. For our example:

$$68\% \text{ CI} = SE / N = 136 / 4000 = .034 = 3.4\%$$

Thus we can infer that, with 68% confidence, the share of women artists is within 3.4% of our survey-generated statistic of 50%; that is, between 46.6% and 53.4%.

However, most surveys use 90% confidence intervals as the preferred level of statistical reliability. On a normally distributed bell curve, 90% of observations will fall within 1.645 standard deviations (errors) from the mean value. To calculate a 90% confidence interval, we multiply our 68% confidence interval by 1.645. Again, with our example:

$$90\% \text{ CI} = 68\% \text{ CI} * 1.645 = 0.0344 * 1.645 = 0.057 = 5.7\%$$

Thus we can infer with 90% confidence, that the percentage of artists that are women falls within 5.7% of our survey-based statistic (50%); that is, between 44.3% and 55.7%.

Is there a minimum base population for aggregating data?

In aggregating PUMA-level data, the most important general rule in determining how precise your estimates will be is the *base*

population—that is, the sum of all the cells from which you will make your estimates. For example, if you were interested in ascertaining the racial/ethnic composition of artists in the City of Chicago, you would sum the total number of artists in all of the PUMAs to be included in your analysis. This represents your base population.

Table A.2 shows approximate confidence intervals (68% and 90%) for various base population levels. As you can see, the confidence intervals begin to decline fairly rapidly at levels of 4000 base population and above. Beyond that threshold, estimates can be made with relatively greater precision; below that level, estimates will suffer from relatively high margins of error.

The actual confidence interval varies based on the subpopulation’s share of the base population. At 50% (e.g., half of artists are women), the confidence interval is largest. The intervals decline somewhat as the subpopulation shares decline toward 0% or increase toward 100%.

Table A.2. Approximate confidence intervals* by base population size

Base Population	68% +/- confidence interval (%)	90% +/- confidence interval (%)
1,000	6.9	11.3
1,500	5.6	9.3
2,000	4.9	8.0
3,000	4.0	6.5
4,000	3.4	5.7
5,000	3.1	5.1
7,500	2.5	4.1
10,000	2.2	3.6
12,500	1.9	3.2
15,000	1.8	2.9
17,500	1.6	2.7
20,000	1.5	2.5
25,000	1.4	2.3
30,000	1.3	2.1
40,000	1.1	1.8
50,000	1.0	1.6
75,000	0.8	1.3
100,000	0.7	1.1

*confidence interval at 50% subpopulation share; intervals decline as shares decrease toward 0% or increase toward 100%.

Case example: Artist race/ethnicity in Boston

An illustrative example of the race/ethnicity composition of artists in the Boston metro area helps to demonstrate standard error and confidence intervals, and the limitations for aggregating and disaggregating PUMA-level data. Table A.3 shows the distribution of artists in the Boston metro area by race/ethnicity groups. The base population of 14,794 provides for 90% confidence intervals of less than +/-2%; in other words, with relative precision.

As we break out different artistic subgroups (Table A.4), our estimates lose some degree of precision. Particularly for musicians, for which we only have a base population of 2618, our confidence interval widens considerably. Our estimate for the share of musicians that are White, non-Hispanic, 82.3%, is bounded at 5.4% confidence interval, meaning that the effective range is between 76.9% and 87.6%. Although the confidence intervals on the non-White groups are smaller, they are large relative to the actual survey estimate.

Aggregating data from the Master file

The Master file allows local LINC groups to develop customized tabulations for geographies

of specific interest to those groups. For example, we can look at the race/ethnicity characteristics of artists residing within the City of Boston. This is done by going to the Master file, selecting the appropriate worksheet corresponding to the variable, and summing the cells across the rows for the selected PUMAs (Table A.5).

In this case, the City of Boston is comprised of five PUMAs (253301–253305), with a total of 3213 employed artists living there. Based on the sums for the different groups, we can compare the race/ethnicity characteristics of artists living in the City of Boston to those living elsewhere in the Boston metro area.

Table A.6 shows that 84.2% of artists living in Boston city are White, non-Hispanic, compared to 90.8% living elsewhere in the metro. The upper bound of the 90% confidence interval for Boston city (88.8%) is just below the lower bound of the 90% confidence interval for non-Boston city (88.9%). Based on this, we can consider the difference in the total share of artists of color living within Boston city and the rest of metro area reasonably significant.

As a very rough general rule, analysis can be done with any level of disaggregation (by PUMA or sub-occupation of artist) where the base population exceeds 3000.

Table A.3. Boston artists by race/ethnicity

Race/ethnicity	Artists	% of total	Std error	68% +/- c.i.	90% +/- c.i.	Low %	High %
White, non-Hispanic	13,221	89.4	163.4	1.1	1.8	87.6	91.2
Black or African-American, non-Hispanic	463	3.1	92.3	0.6	1.0	2.1	4.2
Asian, non-Hispanic	506	3.4	96.4	0.7	1.1	2.3	4.5
Hispanic, all races	507	3.4	96.5	0.7	1.1	2.4	4.5
All other races, including multiracial	97	0.7	42.8	0.3	0.5	0.2	1.1
Total artists, all races/ethnicity	14,794	100					

Table A.4. Boston artists, subgroup, race/ethnicity

Visual artists						
Race/ethnicity	Artists	% of total	90% +- c.i.	Low %	High %	
White, non-Hispanic	4,368	91.1	2.9	88.2	94.1	
Black or African-American, non-Hispanic	102	2.1	1.5	0.6	3.6	
Asian, non-Hispanic	149	3.1	1.8	1.3	4.9	
Hispanic, all races	161	3.4	1.9	1.5	5.2	
All other races, including multiracial	13	0.3	0.5	*	0.8	
Total visual artists, all races/ethnicity	4,793	100				
Performing artists						
Race/ethnicity	Artists	% of total	90% +- c.i.	Low %	High %	
White, non-Hispanic	2,981	92.4	3.3	89	95.7	
Black or African-American, non-Hispanic	68	2.1	1.8	0.3	3.9	
Asian, non-Hispanic	77	2.4	1.9	0.5	4.3	
Hispanic, all races	77	2.4	1.9	0.5	4.3	
All other races, including multiracial	24	0.7	1.1	*	1.8	
Total performing artists, all races/ethnicity	3,227	100				
Musicians and composers						
Race/ethnicity	Artists	% of total	90% +- c.i.	Low %	High %	
White, non-Hispanic	2,154	82.3	5.4	76.9	87.6	
Black or African-American, non-Hispanic	90	3.4	2.6	0.9	6.0	
Asian, non-Hispanic	115	4.4	2.9	1.5	7.3	
Hispanic, all races	218	8.3	3.9	4.5	12.2	
All other races, including multiracial	41	1.6	1.7	*	3.3	
Total musicians, all races/ethnicity	2,618	100				
Writers and authors						
Race/ethnicity	Artists	% of total	90% +- c.i.	Low %	High %	
White, non-Hispanic	3,718	89.5	3.4	86	92.9	
Black or African-American, non-Hispanic	203	4.9	2.4	2.5	7.3	
Asian, non-Hispanic	165	4.0	2.2	1.8	6.1	
Hispanic, all races	51	1.2	1.2	0	2.5	
All other races, including multiracial	19	0.5	0.8	*	1.2	
Total writers, all races/ethnicity	4,156	100				

*lower bound of 90% c.i. less than 0.

Table A.5. Race/ethnicity of characteristics of artists in Boston PUMAs

puma	arts_white	arts_black	arts_asian	arts_hisp	arts_other	arts_total
253301	699	0	85	56	27	867
253302	985	0	62	41	19	1107
253303	92	94	0	0	0	186
253304	220	48	0	0	0	268
253305	709	47	29	0	0	785
total	2705	189	176	97	46	3213

Table A.6. Boston artists by residence location and race/ethnicity

Boston city (PUMAs 253301 to 253305)					
Race/ethnicity	Artists	% of total	90% +- c.i.	Low %	High %
White, non-Hispanic	2,705	84.2	4.6	79.6	88.8
Black or African-American, non-Hispanic	189	5.9	3.0	2.9	8.9
Asian, non-Hispanic	176	5.5	2.9	2.6	8.4
Hispanic, all races	97	3.0	2.2	0.9	5.2
All other races, including multiracial	46	1.4	1.5	*	2.9
Total Boston city artists, all races/ethnicity	3,213	100			
Boston metro, outside Boston city					
Race/ethnicity	Artists	% of total	90% +- c.i.	Low %	High %
White, non-Hispanic	10,516	90.8	1.9	88.9	92.7
Black or African-American, non-Hispanic	274	2.4	1.0	1.4	3.4
Asian, non-Hispanic	330	2.8	1.1	1.7	4.0
Hispanic, all races	410	3.5	1.2	2.3	4.8
All other races, including multiracial	51	0.4	0.4	0	0.9
Total non-Boston city artists, all races/ethnicity	11,581	100			

¹ LINC communities affected by this are Boston (<1% of population nondisclosed), Chicago (1%), Portland (7%), Seattle (3%), and Washington DC (4%).

² The only variable excluded was industry, due to the large number of industries.

³ Formula derived from Example 1 on pages 8–10 of US Census Bureau, *Census of Population and Housing, Summary File 3: Technical Documentation, 2002*.

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“Our LINC research has given us invaluable and previously unknown insights into the size, shape, and economic footprint of our artist community. This information has been vital in building awareness and appreciation for how artists are the often-overlooked creative sparkplug for so much valuable activity here.”

Paul Tyler, Grants Director, the ArtsKC Fund, Arts Council of Metropolitan Kansas City

“Kansas City Artist LINC used census data to confirm the contribution of artists to region's economy. We found that Kansas City is a significant mid-continent arts center with the highest concentration of visual artists of any major city between the coasts. Artists in Kansas City are able to combine family life with their artistic careers.”

Michael Frisch, Assistant Professor, Urban Planning & Design, University of Missouri-Kansas City

“Ann Markusen’s work for LINC on artists greatly expands our ability to look at artists as an occupational group within a community or region. Her work has provided a critical foundation for discussions and research pertaining to artists here in Washington State and permits comparison with other parts of the country. The data help to expand conversations and open doors to working with those who had never previously thought about the role of artists in economic and community development.”

Claudia Bach, AdvisArts Consulting and the Washington Artists Health Insurance Project, Seattle



* Alaska and Hawaii not drawn at the same scale as Continental United States.

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