Bridging and Bonding:

A Multi-dimensional Approach to Regional Social Capital

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Abstract: The operationalization of social capital has proven difficult and elusive. This study advances the operationalization of social capital by (1) employing an existing dataset – the Social Capital Benchmark Survey (SCBS) – to empirically probe the "dimensionality" of social capital for American sub-national regions, and (2) explicating this dimensional structure by examining the relationship of multi-dimensional social capital with regional economic growth. Exploratory and confirmatory factor analyses reveal SCBS's multi-dimensional structure, consistent with Putnam's (2000) dimensions of "bridging" and "bonding." Regression of regional growth on these dimensions supports the validity of these dimensions. With respect to indices of regional growth, bridging social capital yields positive relationships while bonding social capital produces negative relationships. Implications are developed for future operationalization of social capital.

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1. Introduction:

Sociologists and other social scientists have devoted considerable attention and analytic scrutiny to social capital. Much of this scrutiny has been *conceptual* in nature, and has led to a reasonable degree of "consistency in the definitions of social capital at a general level" (Narayan and Cassidy, 2001, p. 61).   Most recent definitions resemble that of Durlauf and Fafchamps (2004, p. 5): "social capital is…network-based processes that generate beneficial outcomes through norms and trust." Insofar as the general construct of social capital is agreed upon, its operationalization has proven surprisingly difficult and elusive. In consequence, Narayan and Cassidy (2001, p. 61) claim that "…at an operational level the interpretations of what social capital is and is not are diverse." As such, they conclude that "[a] worthwhile contribution to the growing body of social capital literature, therefore, is one that advances the reliability and validity of its measures" (p. 61).

This study's purpose is exactly that: to advance the operationalization and validity of social capital indicators by explicating the distinct underlying dimensions of social capital and their multifaceted relationships to a commonly postulated outcome. It uses the Social Capital Benchmark Survey (SCBS) – a standard tool in the study of social capital – and subjects it to rigorous structural analysis. Exploratory and confirmatory factor analysis reveals the SCBS's multi-dimensional structure, approximating the familiar "bridging" and "bonding" social capital as characterized by Putnam (2000, pp. 22-24). Regressions of regional growth on these dimensions further validate the measures and enhance their interpretability.

Recent research has investigated the dimensionality and validity of social capital indicators (e.g. Narayan and Cassidy, 2001, in developing communities; Messner, Baumer, and Rosenfeld, 2004, for effects on criminal homicide rates; van Oorschot and Arts, 2005, for effects on the European welfare state). These studies operationalize social capital differently depending on their purpose, to forecast community solidarity or evaluate the adverse impact of government policy, suggesting that social capital takes somewhat different forms depending upon its context. The present study investigates the nature and functioning of social capital in the context of economic growth.

The paper proceeds as follows: We begin with a brief literature review that provides the basis for our own work by (1) demonstrating the consensus on general social capital concepts and definitions, and (2) introducing recent conceptual innovations that guide our empirical analyses. We then discuss the challenges of operationalizing these general concepts, first by discussing recent attempts to do so, and then by outlining the specific motivations for our own research. Next we present our methods and findings, and conclude with the implications of our work and recommendations for future research.

2. Literature Review / Concepts:

2.1 Social Capital Theory

The origins of social capital theory lie primarily with Pierre Bourdieu (1983) and James Coleman (1988), and current consensus on its definition builds upon their work. Bourdieu (1983, p. 248) defines social capital as "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual

acquaintance or recognition". Similarly, Coleman (1988, p. S98) describes social capital as "a variety of entities with two elements in common: They all consist of some aspect of social structures, and they facilitate certain actions of actors – whether personal or corporate actors – within the structure." Portes (1998, p. 6), in his own review of Coleman and Bourdieu, offers a very similar definition when he asserts that "social capital stands for the ability of actors to secure benefits by virtue of membership in social networks or other social structures."

More recently political scientist Robert Putnam has assumed a central place in considerations of social capital. Putnam (2000, p. 19) asserts that the "core idea of social capital theory is that social networks have value". He first defines social capital (1993, p. 167) as "features of social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions", and then later (2000, p. 19) refines this to "…connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them".

Putnam's definition is clearly reflective of Coleman and Bourdieu's earlier attempts. In fact, in an exhaustive review of the existing social capital literature, Durlauf and Fafchamps (2004, p. 5) provide an articulate summary: "…we can distinguish [in the existing literature] three main underlying ideas: (1) social capital generates positive externalities for members of a group; (2) these externalities are achieved through shared trust, norms, and values and their consequent effects on expectations and behavior; (3) shared trust, norms, and values arise from informal forms of organizations based on social networks and associations. The study of social capital is that of network-based processes that generate beneficial outcomes through norms and trust."

2.2 Recent Conceptual Innovations

Although Putnam's treatment of social capital is predominantly in line with older ones, he also makes important departures and additions. For instance, earlier theorists like Bourdieu and Coleman assert that although social capital is held collectively and embedded in people's social relationships, its fruits are realized and appropriated by individuals. Importantly, Robert Putnam departs from this view, claiming instead that social capital is to be understood as the social ties, connections, networks, and norms from which individuals *and* collectivities benefit. Putnam states that social capital is *both* a private and a public good, with benefits accruing not only to those persons making the investment in social networks but also to the wider community in the form of positive externalities (Portes, p. 2000). Therefore, after Putnam we can conceive of a city's or country's "stock" of social capital, as when he (2000, p. 319) claims that "where trust and social networks flourish, individuals, firms, neighborhoods, and even nations prosper".

Putnam also devotes considerable attention to the "dimensionality" of social capital, anticipating that it manifests itself in a variety of distinct forms. Several scholars had previously called for the adoption of a multi-dimensional view of social capital. Woolcock (1998, p. 159) is typical of these, asserting that "…there are different types, levels, or dimensions of social capital, different performance outcomes associated with different combinations of these dimensions, and different sets of conditions that support or weaken favorable combinations." He recommends that scholarship should "…search for lessons from empirical research that embrace a range of any such dimensions, levels, or conditions." Similarly, Coté´ (2001, p. 31) characterizes social capital as "…multidimensional, multifaceted, relational, and…incorporates different levels and units of analysis." Putnam (2000, pp. 22-24) himself discusses two social capital dimensions:

"bridging" and "bonding", where "[o]f all the dimensions along which forms of social capital vary", "bridging" and "bonding" are the two most important. Noting that bridging and bonding are "not 'either-or' categories into which social networks can be neatly divided, but 'more-or-less' dimensions along which we can compare different forms of social capital", he defines "bridging" as outward-looking networks and connections among different kinds of people – like the civil rights movement – and "bonding" as inward-looking networks bringing together similar kinds of people – like church-based women's reading groups. Furthermore, Putnam claims that bridging social capital spans "diverse social cleavages" while bonding social capital reinforces exclusive identities and homogeneous groups. de Souza Briggs (2003, p. 2) adds that "[b]y connecting persons and other social 'sites' with distinct traits, [bridging] ties often constitute bridges across roles, status differences, material and symbolic interests, space, norms, and even worldviews."

Putnam and others also suggest that bridging and bonding social capital have different consequences and effects. Speaking generally, Putnam (2000, p. 22) tells us that "[b]onding social capital is good for undergirding specific reciprocity and mobilizing solidarity….Bridging networks, by contrast are better for linkage to external assets and for information diffusion….Bonding social capital is, as Xavier de Souza Briggs puts it, good for 'getting by', but bridging social capital is crucial for 'getting ahead'." Therefore, according to existing literature, while bonding social capital is geared towards enabling survival, bridging is oriented to moving ahead, development, and growth.

Indeed, existing literature also makes suggestions about the respective relevance of both bridging and bonding social capital in the particular substantive domain of economic performance. Putnam (2000, p. 323) comments that "[a]t the local or regional level, there is mounting evidence that social capital among economic actors can produce aggregate economic growth", later (2002) narrowing this to suggest instead that "[m]ost of the research suggests bridging social ties (sometimes called 'weak' ties) are more likely to be drivers of economic growth than bonding social ties." de Souza Briggs (2003, p. 10) describes previous studies linking bridging ties to the economic attainment of poor inner city minorities. He notes that "black females who get job information from neighbors earn less than those who utilize job contacts from outside the neighborhood", and suggests that bridging ties account for this by improving access to "information, vouching (recommendations and other social endorsements), preparation, mentoring, and other keys to economic access and attainment." Conversely, Putnam (2000, p. 322) suggests ways in which bonding social capital can negatively impact economic attainment. He writes that "[a]lthough ethnic enclaves provide start-up capital and customers to their own entrepreneurs, the pressures of solidarity can drag down individuals and businesses that succeed 'too much' or that try to expand beyond the immediate ethnically based market."

2.3 Construct Validity Issues

Although consensus has emerged around these *conceptual* issues, no such consensus exists with regard to the translation of these social capital concepts – including bridging and bonding – into operational measures. Since, as Narayan and Cassidy (2001, p. 61) claim, "[t]heories such as social capital comprise constructs that are inherently abstract and require subjective interpretation in their translation into operational measures", "at an operational level the

interpretations of what social capital is and is not are diverse." As such, they conclude that "[a] worthwhile contribution to the growing body of social capital literature, therefore, is one that advances the reliability and validity of its measures." This paper attempts to do exactly that: to advance the validity of social capital operationalizations for American geographic regions in ways and for reasons that we will shortly discuss.

Ours is not the only research to consider validity issues. Narayan and Cassidy (2001, p. 61) aim to identify a set of "statistically validated survey questions for measuring social capital in developing communities." They do so for Ghana and Uganda by first hypothesizing a dimensional structure for social capital – trust, groups, generalized norms, togetherness, everyday socialability, neighborhood connections, and volunteerism are the "dimensions" they posit – and then by employing factor analysis to determine precisely which survey questions best depict their deduced dimensionality. Similarly, upon analyzing a data set from European countries van Oorschot and Arts (2005) identify "trust", "group participation", "family and friendship networks", and "political engagement" as interpretations of their factor analyses of survey questions. Also, they subsequently employ their composite social capital indices (which they call "dimensions") to investigate the "crowding-out" hypothesis in the European welfare state. Finally, Messner et al (2004) utilize factor analysis to explore a dimensional structure for U.S. regions. They then probe the relationships between the 12 "dimensions" they uncover – which include "trust", "informal socializing", "religious participation", and "political engagement and activism" – and criminal homicide rates. Therefore, by drawing upon the determination that there exist multiple "forms" of social capital and then by employing in our analyses composite social capital indices that closely mirror those that they construct ("trust",

"volunteering", "political engagement", etc.), our research builds upon these earlier attempts at validating social capital measures.

Nonetheless, we contend that the dimensionality of social capital warrants further conceptual development prior to operationalization. Putnam's account of social capital's dimensionality motivates and frames the current research. As mentioned above, Putnam differentiates between "bridging" social capital – outward looking ties that "encompass people across diverse social cleavages", and "bonding" social capital – inward looking connections that promote in-group solidarity and "reinforce exclusive identities and homogeneous groups" (2000, p. 22). However, nowhere does this conceptual distinction carry over to his actual measurement of social capital. Whereas Putnam measures social capital in a variety of ways – as political participation, group membership, religious participation, informal socializing, giving and volunteering, social trust, etc. – he is never explicit about their dimensionality. He never states whether all of the measures are "bridging" social capital, whether all are "bonding", whether some are bridging and some bonding, or whether the variables fall along other dimensions. Additionally, he expends substantial effort in *Bowling Alone* characterizing the apparent decline and deterioration of all of these varieties of social capital in the United States over the past forty years. Given both, we are left to infer that he considers all of his social capital measures as normatively equal, as all loading similarly on the same "social capital" dimension. However, we assert that this assumption of empirical uni-dimensionality is inappropriate, and investigate the empirical dimensionality of Putnam's social capital indices with respect to "bridging" and "bonding". Doing so is especially important in light of Putnam's frank comment that "I have found no reliable, comprehensive, nationwide measures of social capital that neatly distinguish

'bridgingness' and 'bondingness'". To our knowledge no previous empirical research has done so. Additionally, given Putnam's focus on aggregate social capital, in all of our analyses we seek a dimensional structure for regional social capital in the United States – specifically, our unit of analysis is the U.S. Census-defined Public Use Microdata Area (PUMA). Finally, given the commonly held belief that bridging social capital is better suited to economic growth than is bonding, we attempt to further explicate and validate these dimensions by performing analyses relating regional economic growth to our multi-dimensional operationalization of social capital. We now turn our attention to the empirical study.

3. Data:

The above tasks require measures of social capital and growth, as well as other important variables [see Table 1 for descriptive statistics].

<Table 1 about here>

The Public Use Microdata Area (PUMA) is the unit of analysis for this study. The PUMA is the geographic area constructed for the U.S. Census Public Use Microdata Sample (PUMS), and we aggregate other smaller data to this level using geographic equivalency files we created. Additionally, we use the PUMA codes from the 2000 Census. The PUMA is used here as an entity of aggregation, not as a socially constructed geographic entity. Rather, the PUMA provides the opportunity to link data on social capital with the economic standing of the larger geographic setting in which it is embedded. The PUMA is thus adequate for purposes of exploring the multi-dimensionality of social capital and its differential outcomes. In addition, PUMAs are a relatively small geography in terms of population – PUMAs have a maximum population of about 100,000 persons – but also often in terms of physical size. These various

measures of social capital reveal something about the character of the social connections, values, and norms of a place, and one can recover a more precise portrait of these social connections by dealing with smaller units of geography. We naturally lose some information about these connections by focusing on larger units and averaging over smaller geographies. Also, we achieve a larger sample size (n = 127) by summarizing our individual-level social capital measures to the PUMA level than by summarizing them to the tract level (n = 22), place level (n = 76), county level (n = 63), PMSA level (n = 19), CMSA level (n = 39), or State level (n = 31). Of course, there are also shortcomings to using PUMAs. Most notably, whereas Metropolitan Statistical Areas (MSA) are to some extent reflective of economic spheres of influence, PUMAs are not. PUMA boundaries are somewhat more arbitrary than those of the MSA, though it is worth noting that for the 2000 Census, PUMAs are for the first time self-contained in MSAs.

We draw our data from two sources: i) Robert Putnam's Social Capital Benchmark Survey (SCBS), and ii) the U.S. Census.

3.1 Social Capital Benchmark Survey (SCBS)

The Social Capital Benchmark Survey was developed and conducted by the Saguaro Seminar at Harvard University's John F. Kennedy School of Government, and the effort was largely spearheaded by Robert Putnam. The resultant data from the survey is archived at the Roper Center for Public Opinion Research, and their documentation states that a primary purpose of the benchmark survey is "…to measure various manifestations of social capital" in order to "provide a rich database for analysis by interested researchers who wish to better understand social capital." Additionally – and crucially for our purposes – they note that the SCBS is "the first

attempt at widespread systematic measurement of social capital, especially within communities…." Therefore, the SCBS is of tremendous value to us because it is the first survey to measure social capital in a variety of different ways for regions and communities within the United States. TNS Intersearch, an international survey firm, conducted the survey by telephone from July – November 2000. The survey was administered to a national sample of 3003 respondents and to an additional 41 U.S. "communities" for an additional 26,230 participants. The 41 communities are a mixture of cities, parts of cities, counties, combinations of counties, and entire states. It is worth noting that while there was random sampling for the national survey and within the 41 communities, these communities are in no way nationally representative. These 41 communities are included in the survey because local community foundations provided funding to enable their region's participation. Although we would obviously prefer a more representative selection of "communities" the SCBS remains an enormously rich dataset permitting for the first time the operationalization of social capital in numerous ways at a sub-national level.

The publicly available SCBS provides survey data for all 29,233 individual respondents, but only supplies geographic codes for the 41 communities and for Census Divisions and Regions (e.g. Northeast, Midwest, etc.). The Roper Center suppresses the geographic identifiers for small geographies (tracts, blocks, places, counties, etc.), and only released them to us once we submitted an application requesting them. Once our application was approved, Roper sent us a dataset with all 29,233 individual observations measured on all variables and with geographic identifiers down to the Census tract level. When we merge the SCBS to our Census dataset using the tract codes, we achieve 15,480 unique matches[i]. Additionally as noted above, we

summarize our final merged tract-level dataset to the PUMA-level. Once the data are summarized, there are 127 PUMAs (out of 1195) that contain at least 30 observations, and we choose to only perform our analyses with this set of PUMAs[ii]. These 127 PUMAs retain 10,806 of the 15,480 total observations[iii]. To justify this summarization, we conducted one-way analysis of variance on these 10,806 individual observations for the social capital variables used in the primary analysis (described below), with the PUMA as the independent variable. These ANOVAs all revealed significant differences at the individual level, thus substantiating aggregation to the PUMA level.

The SCBS consists of hundreds of questions on political, religious, and social forms of involvement and engagement, attitudes about various social issues of contemporary concern, and the character of one's personal relationships with others. Once the data were collected, the experimenters used the responses to these many questions to construct a number of composite indices reflecting different aspects of social capital. We use several of these indices in our analyses, and describe them below[iv].

3.1.1 Social Trust Composite Index

This index combines measures of the trust a respondent has in "most people", one's neighbors, co-workers, fellow religious congregants, store employees, and local police.

3.1.2 Diversity of Friendships Composite Index

This index measures the extent to which a respondent has a diverse network of personal friends and relationships. It is a count of how many different kinds of friends a person has from a set of 11 different types of people.

3.1.3 Group Involvement Composite Index

This index measures the degree of associational and group involvement. It is a count of the number of groups out of 18 different kinds in which a respondent reported participating in the previous 12 months.

3.1.4 Faith-Based Engagement Composite Index

This index measures a respondent's church membership, church attendance, participation in church activities besides services, participation in non-church religious groups, giving to religious causes, and religiously oriented volunteering.

3.1.5 Giving and Volunteering Composite Index

This index measures the extent of a respondent's volunteering for a variety of different organizations and the extent to which they contribute to various causes.

3.1.6 Conventional Politics Composite Index

This is a composite index measuring whether a respondent is registered to vote, whether they have recently voted, expressed interest in politics, knowledge of one's Senators, and frequency of newspaper readership.

3.1.7 Protest Politics Composite Index

This index measures a respondent's involvement in non-electoral forms of political participation, including: signing petitions, attending political meetings or rallies, taking part in demonstrations, protests, boycotts, or marches, involvement in local reform efforts, membership in political groups, ethnic, nationality, or civil rights groups, or labor unions.

3.1.8 Urban / Rural

This variable is the average for a PUMA of the transposed codes on the SCBS "Metropolitan Status" variable. We suggest that higher values on this index represent more "urban" PUMAs, while lower values represent more "rural" PUMAs.

3.2 Census measures

Most international-level studies measure growth as increases in per-capita GDP. However, measuring growth for cities and regions is a more difficult proposition, and no similar consensus exists as to what is the most appropriate index for analyses at these smaller geographies. Population growth is a commonly used measure, as is employment growth. Population growth indicates a "revealed preference" for a place, and is therefore suggestive of a region's desirability. Similarly, economically viable regions will add jobs over time, and therefore many studies include employment growth as an outcome variable. However, as Glaeser (1994, p. 18) puts it, "…these measures rarely resemble the wealth (or welfare) increases that we are ultimately interested in examining." Indeed, these two measures, while useful, do not sufficiently depict the overall prosperity of a place. Therefore, additional measures might include income growth and median housing value growth. Income growth indicates that a

locales' economic activity is becoming increasingly more valued, and that accordingly people are being more lucratively compensated. Since individuals are regarded as better off as their wealth increases, it is an adequate measure of welfare. Median housing value is another way of assessing how markets view the "attractiveness" of, or "desirability" and demand for a place. Median housing values may grow if people come to regard their region favorably and thus invest substantially in their homes. Similarly, rising housing values may simply be indicative of the increasing attractiveness of a place, and therefore also serve as a measure of average well-being.

3.2.1 Population growth[v]

We calculate population growth from 1990 to 2000. The Census 2000 Summary File 3 geoheader file contains the 100% count population variable, whereas the 1990 100% population count variable is found in data file 01 in the 1990 Summary Tape File 3. We calculate PUMA-level population growth as log(population2000/population1990).

3.2.2 Employment growth

We calculate employment growth from 1990 to 2000. 2000 Total Civilian Employment is in the 2000 Summary File 3, data file 04, whereas 1990 Total Civilian Employment is in the 1990 Summary Tape File 3, data file 12. We calculate PUMA-level employment growth as log(totalemp2000/totalemp1990).

3.2.3 Income growth

We calculate income growth from 1989 to 1999. 1999 Per Capita Income is in the 2000 Summary File 3, data file 07, whereas 1989 Per Capita Income is in the 1990 Summary Tape

File 3, data file 22. We calculate PUMA-level income growth as
log(percapinc99/percapinc89)[vi].

3.2.4 Median Housing Value growth

We calculate median housing value growth from 1990 to 2000. 2000 Median Value for Specified Owner Occupied Housing Units is in the 2000 Summary File 3, data file 60, whereas 1990 Median Value for Specified Owner Occupied Housing Units is in the 1990 Summary Tape File 3, data file 33. We calculate PUMA-level average median-housing-value growth as log(avgmedhv00/avgmedhv90)[vii]. As noted, since there is no consensus as to which measure best captures growth, we employ them all in our analyses.

3.2.5 Human Capital

We calculate the 2000 PUMA-level percentage of the population 25 years and over with a Bachelor's degree and above. The necessary data is in the 2000 Census Summary File 3, data file 03.

3.3 Criticisms of Putnam data

Measuring social capital is challenging, and other researchers have criticized the means by which Putnam has done so. These criticisms were largely directed at Putnam's use of survey data, specifically the individualistic nature of Putnam's data, and as such apply to the SCBS as well. For example, Skocpol (1996, p. 22) writes that "[i]ronically for a scholar who calls attention to social interconnectedness, Putnam works with atomistic concepts and data. He writes as if civic associations spring from the purely local decisions of collections of individuals…." Also,

Skocpol (1996, p. 22) seemingly is not pleased that Putnam "…tries to derive group outcomes by testing one variable at a time against such highly aggregated individual data." Elsewhere, Sampson levels a similar rebuke when he notes that "[b]oth Coleman and Bourdieu conceived of social capital as a resource appropriated by individuals, even though the resource is embedded in social structures. By contrast, Putnam is often credited with expanding social capital to the aggregate level, as in the social capital of provinces, nations, and neighborhoods (Portes). Yet, Putnam's measures are individual-level and Coleman's discussion pertains to the structural level!" Skocpol and Sampson both argue that Putnam's aggregation of individual-level data up to collectivities does not adequately – or does not at all – reflect or capture the social structural nature of social capital. These are certainly sensible and legitimate critiques. However, the composite variables in the SCBS, however imperfect they may be, still enable us to learn something interesting about the *character* and *nature* of the social connections in a place, irregardless of the fact that they are aggregations of individual level data.

Nonetheless, close inspection of Putnam et al's construction of the SCBS composite indices raises concern about one of these measures in particular – the "Group Involvement" index. The Group Involvement index is a simple count of how many groups out of a highly diverse set of eighteen in which a respondent participates. An inference from this method of constructing the index is that all of the constituent groups comprising it are normatively the same, that participation in one kind of group is equivalent to participation in all other groups. As such, according to Putnam et al, participation in a fraternal organization is considered equivalent to participation in a literary group. This inference struck us as implausible given the differential nature of the social ties involved, thus calling into question the construct validity of this

19

particular composite index and raising the possibility that we should replace Putnam's Group Involvement index with several new group involvement measures that reflect different kinds of groups.

Additionally, existing literature points to the existence of numerous "types" of groups, while also proposing a particular typology. Specifically, Stolle and Rochon (1998) and Price (2005) both suggest the distinction between "inclusive" and "exclusive" groups. For example, Price (2005, p. 11) explains how membership to the Rotarians has only been open to women since 1987. Additionally, she notes that although women are now admitted, membership is often still "invitation only" and subject to review by current members. In contrast, many newer civic groups are aggressively inclusive on all fronts. We employ this existing theory to guide our classification of the eighteen SCBS group measures and the construction of several new "group" composite indices.

First, we conduct a factor analysis of the 18 constituent group measures that comprise the composite index under the assumption that all 18 variables will load positively and substantially on one of the retained factors if construct validity is achieved. Three factors have eigenvalues of about 1.0 or greater and account for 90 percent of the total variance amongst the 18 variables. Focusing on the first factor [see Table 2 for the factor pattern], we do not observe positive and substantial loadings on all 18 variables, instead obtaining negative or negligible (< 0.40) loadings on 12 of the measures. Therefore, Putnam et al's Group Involvement Index does not achieve construct validity, and instead the results correspond with the existence of numerous types of groups.

<Table 2 about here>

This evidence of numerous "types" of groups leads us to the next steps: (i) characterizing the group types and (ii) assigning the 18 SCBS group measures to these different types. Based upon the literature, we characterize groups as either "inclusive" or "exclusive". Inclusive groups are those for which there are no restrictions or screening for participation or membership, and that therefore are groups in which anyone can join. Conversely, "exclusive" groups are those with membership or participation restrictions. To guide the categorization of the 18 SCBS group measures as either "inclusive" or "exclusive", we asked 15 "experts" to judge ("yes" or "no") whether they considered there to be *any* restrictions for membership or participation in each of the 18 group measures.[viii] Table 3 shows the inter-rater reliability (percent agreement) of the raters' judgements of group "inclusivity" or "exclusivity". Of the 17 groups, there are 8 for which at least 80% of the experts agreed as to the "inclusivity" or "exclusivity". For instance, 93.33% of the raters regard religious groups, groups for the elderly, and fraternal organizations as "exclusive", while 86.67% and 80% regard youth groups and labor unions as "exclusive", respectively. Conversely, 92.86%, 84.62%, and 80% of the raters regard hobby groups, internet groups, and literary/art groups as "inclusive", respectively.

<Table 3 about here>

As such, utilizing only those measures for which there is at least 80% agreement[ix], we create two new "group" indices – an "inclusive" group index and an "exclusive" group index – by counting up the number of inclusive groups in which an individual participates and similarly counting the number of exclusive groups in which an individual participates. These individual counts are then averaged up to the PUMA level.[x]

The "exclusive" and "inclusive" group indices are negatively and significantly correlated with one another (r = -0.19). "Exclusive" groups are negatively and significantly correlated with diversity of friendships (r = -0.20) and protest politics (r = -0.37), and positively and significantly correlated to faith-based engagement (r = 0.72) and giving and volunteering (r = 0.42). "Inclusive" groups are negatively and significantly correlated to faith-based engagement (r = -0.32), and positively and significantly related to diversity of friendships (r = 0.59), protest politics (r = 0.71), electoral politics (r = 0.55), and giving and volunteering (r = 0.39).

4. Analysis and Results

Our analysis plan is two-fold. First, we empirically probe social capital's regional "dimensionality" to query whether there are there multiple dimensions or types of social capital in U.S. regions and what they are. Second, we further validate this dimensional structure by examining the relationships multi-dimensional social capital has with regional economic growth.

4.1 Social Capital Dimensionality

In this section we empirically uncover the existence of and characterize the nature of multiple dimensions of regional social connectivity underlying the SCBS composite indices. We employ principal factor analysis with a varimax rotation to explore the underlying interrelationships and dimensionality among the exclusive and inclusive group indices and the six other SCBS composite measures. Factor analysis is appropriate for this task because it exists chiefly to identify latent variables that contribute to the covariation or correlation among a set of observed variables. These latencies or dimensions – called factors – imply ways of combining variables,

22

thus resulting in improved measurement of indirectly observed concepts while also simplifying subsequent analyses (Hamilton, 1992, p. 249).

We first perform a principal factor analysis on our 8 SCBS composite variables (social trust, diversity of friendships, faith-based engagement, inclusive and exclusive groups, giving and volunteering, electoral politics, and protest politics). Although we observe evidence of a multi-dimensional structure, three variables – social trust, giving and volunteering, and protest politics – do not achieve a "simple" factor structure, meaning that these variables do not load heavily on only one factor. As a result, these three indices do not contribute to the differentiation between dimensions, and we resultantly drop them from the analysis. (Note that we evaluate the relationship of these removed indices to our economic economic indicators. Except for a correlation of 0.32 between protest politics and income growth, we find negligible correlations for each of these removed variables.) Our final factor analysis – which does achieve simple structure – is therefore performed on the remaining 5 composite indices, and the results are provided in Table 4. This factor analysis returns two factors with eigenvalues greater than 1.0, and by the Kaiser criteria we retain only these two factors for interpretation. The first factor has positive and substantial loadings on diversity of friendships, inclusive groups, and electoral politics, and negligible loadings on exclusive groups and faith-based engagement. The second factor has positive and substantial loadings on exclusive groups and faith-based engagement, and negligible loadings on diversity of friendships, inclusive groups, and electoral politics.

This factor structure provides support for the multi-dimensionality of social capital – the variables loading on the first factor reveal one distinct dimension and the variables loading on

the second factor reveal another. These two factors are the latent dimensions accounting for the

correlation between our 5 composite indices. Technically speaking, we have an orthogonal axis

structure in two-dimensional vector space ($\mathbf{R}^2$). Conversely, had all 5 SCBS composite indices

loaded similarly on one factor, we would have instead suggested that these data provide evidence

of a unitary conceptualization of social capital.

<center><Table 4 about here></center>

The first factor is indicative of "bridging" social capital, where dissimilar individuals come

together through varied friendship ties, broadly constituted groups, and political activity. As

noted above, bridging social capital characterizes networks, associations, or organizations

involving diverse people. By bringing a broad mix of people together, Putnam claims this type

of social capital spans social cleavages. All three measures that load on this factor – diversity of

friendships, inclusive groups, and electoral politics – tap the diverse nature of American society

and the majority-rule character of its political system, where electoral success entails bringing

together people from many sociological categories. Additionally, de Souza Briggs (2003, p. 11)

asserts that:

> Cross-cutting ties are essential to the development of
>
> broader identities and communities of interest. These
>
> are the social foundations of power sharing, without which
>
> the formal machinery of democratic government – competitive
>
> elections, rule of law, freedom of assembly and of the
>
> press, and more – tends to falter around the world….The
>
> absence of bridging ties undermines the reciprocity and
>
> learning crucial to democratic behavior, as well as the formation

<center>24</center>

of bridging coaltions essential for significant change.

Furthermore, due to their openness and lack of membership restrictions, inclusive groups similarly are likely to "bridge". Finally, diverse friendship networks are without question a form of bridging social capital – by definition higher values on this index mean one's friends are from all walks of life.

The second factor is indicative of "bonding" social capital where networks and associations bring similar people together. As described above, Putnam claims that by bringing only similar people together, bonding social capital reinforces exclusive identities and under-girds homogeneous groups. The two indices loading positively on this factor – exclusive groups and faith-based engagement – are tied to the screening and membership restrictions characterizing groups with similar and homogeneous membership. Recent literature links faith-based engagement with bonding social capital and norms of insularity and conformity (e.g. Patterson, 2004). Putnam himself admits that "religious involvement, especially involvement in fundamentalist churches, is linked to intolerance" (2000, p. 355). Further, he suggests that Protestantism is becoming more evangelical and fundamentalist, and that "evangelicals are more likely to be involved within their own communities but are less likely to be involved in the broader community" (2000, p. 77), thus revealing an inherent insularity. Patterson (2004, p. 346) says the following about Pentacostalism in Latin America:

> Pentacostalism teaches its initiates withdrawal and passivity
>
> in political matters, limited only by the commandment to be
>
> submissive to authority. In its social forms, it appears as a
>
> specialized (since it is purely religious) reincarnation of a

moribund society, and as the heir of the past rather than as the

precursor of emerging society. The components create a

force for order rather than an element of progress; a defender

of the status quo rather than a promoter of change.

Therefore, faith-based social capital has been linked to insularity, conformity, intolerance, and

hostility to new approaches and change.

Additionally, the correlations in Table 5 comport with a dimensional structure very similar to

that uncovered in the factor analysis. Human Capital – measured as the percentage of the adult

population with a bachelor's degree and above – is negatively correlated with faith-based

engagement (r = -0.402) and exclusive groups (r = -0.329), while it is positively and significantly

correlated to diversity of friendships (r = 0.529), electoral politics (r = 0.529), and inclusive

groups (r = 0.579). We observe a social capital typology in Table 5 similar to that in the factor

analysis, with "bridging" forms of social capital positively correlated with education while

"bonding" social capital relate negatively to human capital.

<Table 5 about here>

Finally, we further examined the validity of this dimensional structure by conducting a

confirmatory factor analysis (CFA) using AMOS 5 software. CFA enables us to evaluate the

goodness-of-fit of our two-dimensional factor structure to the observed data, while also

comparing its fit to any rival factor structures. The one-factor model reflects a monolithic, uni-

dimensional approach to social capital – that is, whether there is a single social capital continuum

or dimension accounting for the covariances between different measures. The two-factor model,

consisting of bridging and bonding, is our preferred model[xi]. Fit statistics for these models are

shown in Table 6. The first column presents the Chi-squared test of the discrepancy between observed covariances and those implied by the model. Since we do not wish to reject the null hypothesis of zero discrepancy, our two-factor model suggests the best fit of the two models. The summary statistic for measurement of this discrepancy – the root-mean-square error approximation – is lowest for the two-factor model, also suggesting the best fit. Since this statistic measures the mean of the absolute value of individual discrepancies, we want it to be as close to zero as possible because large values mean that the model underpredicts the observed covariances (Bollen, 1989, p. 257). Additionally, the two-factor model was the only factor structure having an incremental fit index (IFI), Tucker-Lewis index (TLI), and normed fit index (NFI) above the recommended threshold of 0.90. These indices compare the fit of a particular model with the fit of a baseline model that typically has no common factors – and therefore no covariance among the measured variables. These measures depict the incremental improvement in fit for the tested model relative to the baseline (Bollen, 1989, p. 270), and as observed in Table 6, our two-factor model fits the data better than does a one-factor model.

<Table 6 about here>

Therefore, in the most general sense, from all of these analyses we gain insight into how to best describe and characterize the social nature of place. We assert that to do so and also to be able to draw distinctions between the social structures of different places, one must necessarily regard social capital as a multi-dimensional construct. The above analyses – of the group involvement measures, of the SCBS composites, and those with human capital – point to several social dimensions along which places differ. Specifically, building upon the literature, we identify "inclusive" and "exclusive" groups, and "bridging" and "bonding" social capital. Finally, these analyses and findings are a novel contribution to the study of social capital by providing for the

27

first time empirical evidence of the "bridging" and "bonding" dimensions of regional social capital.

4.2 Bridging, Bonding, and Regional Economic Growth

In the previous section we identify two dimensions of regional-level social capital that we interpret as "bridging" and "bonding".   We calculate the factor scores for each of the two factors, thus giving us "bridging" and "bonding" social capital indices. As noted earlier, previous literature suggests specific relationships between these dimensions and economic growth – a positive relationship between "bridging" and growth, and a negative relationship between "bonding" and growth. As such, if we have empirically identified valid regional operationalizations of the "bridging" and "bonding" dimensions, we should empirically observe similar relationships between our "bridging" and "bonding" indices and measures of regional economic growth. As such, examining these empirical relationships serves as further validation and explication.

In Table 7 we explore these relationships after taking into account other important controls. Table 7 provides the results of a least squares regression at the PUMA level of our three growth measures on the two new social capital dimensions ("bridging" and "bonding"), human capital, initial income, population, employment, or median housing value, and our urban / rural variable. In order to account for the region of the U.S. in which a PUMA falls, we estimate these regressions treating Census Region (i.e. Northeast, Midwest, South, or West) as a fixed effect.

<Table 7 about here>

We observe that "bridging" social capital relates positively (and significantly at the 0.10 level) with income growth. Specifically, income increases by about 1.4% with each 1-standard deviation increase in "bridging" social capital. We interpret this to mean that regions with "bridging" social capital have higher rates of income growth. "Bonding" social capital is negatively and significantly (at the 0.01 level) related to income growth. Income decreases by 2.8% with each 1-standard deviation increase in "bonding" social capital. This means that regions with higher degrees of "bonding" social capital have lower rates of income growth. Human capital is also positively and significantly associated with income growth. Bridging social capital is again positively related to employment growth and bonding negatively related, but neither is statistically significant. Bonding social capital relates negatively to median housing value growth, and is significant at the 0.10 level. Median housing value growth declines by about 2.5% with each one standard deviation increase in bonding social capital. Although significance is primarily limited to the income growth regression, in Table 7 we observe a positive relationship between higher "bridging" social capital and growth and a negative relationship between lower "bonding" social capital and growth.

These results are, of course, preliminary in that they do not probe or test the underlying mechanisms associated with these two constructs, nor do they enable us to make precise causal assertions. However, since they are broadly reflective of relationships forecast by social capital theory, we regard them as supporting the validity of our operationalizations of "bridging" and "bonding". In addition we regard it as an interesting finding in itself that our measure of "bonding" social capital – a combination of exclusive groups and faith-based engagement – consistently relates negatively to regional economic growth, and our measure of "bridging"

social capital – a combination of inclusive groups, diverse friendship networks, and electoral political engagement – often relates positively to regional growth. Therefore, through these regional growth analyses we also gain additional insight into the nature of these dimensions.

4.3 Sensitivity Analyses

4.3.1 Robust Standard Error Regressions

Appendix A reveals that in several cases we have observations (PUMAs) that may be geographically proximate, thus calling into question their independence. Spatial dependence may bias downward the standard errors of the coefficient estimates, possibly affecting the interpretation of hypothesis tests. To account for this possibility, we calculate robust standard errors using Stata's cluster correction option for regressions. When we define our clusters at the "city" level we have 88 clusters, and by definition we assume between-cluster independence but not within-cluster independence. The adjustment of the standard errors in this way causes little change in the income growth regression: the coefficient on "bridging" social capital in the income growth regression is still significant at the 0.10 level for a one-tailed significance test, and the coefficient on "bonding" social capital negatively relates to income growth at the 0.05 level of significance, also for a one-tailed test. The coefficient on "bonding" social capital is no longer significant at the 0.10 level in the median housing value growth regression after cluster correcting the standard errors. The point estimates of course do not change in any of the regression estimations. While performing this correction is in principle justifiable, the ostensible effect of course is to reduce the power of the hypothesis tests by reducing the sample size. Employing the clusters effectively simulates an aggregation up to a larger geography, but as noted in section 3, we choose PUMAs as our unit of analysis because we regard social capital as

a small geography phenomenon and therefore as one that can be more accurately conceptualized and measured at smaller geographies. Therefore, by employing the cluster correction we potentially sacrifice much information that we consider to be important. Therefore, in our case there is a trade-off between (1) ensuring the independence of observations and (2) conceptual precision and the power of the test.

4.3.2 Sample Size Considerations

Towards the end of section 3.1, we describe the process by which we use tract codes to summarize the SCBS responses and Census data up to the PUMA-level geography. We also note in that section that there are 127 PUMAs containing at least 30 SCBS observations, and that we chose to conduct our analyses with that set of PUMAs. We argue in that section that a threshold of 30 SCBS observations per PUMA sufficiently provides a stable estimate for our variables of interest while also providing enough PUMAs to enable eventual factor analyses and regression estimations. Yet, since in summarizing the data up to the PUMA level there is an inverse relationship between a threshold of SCBS observations in a PUMA and the number of PUMAs that meet that threshold, we need to examine the sensitivity of our analyses to varying the threshold. For instance, there are 101 PUMAs with at least 45 SCBS observations per PUMA, whereas conversely there are 221 PUMAs with at least 15 SCBS observations (see Table 8). Although in the latter case there are more PUMAs with which to conduct factor analyses and regressions, the summary social capital measures are likely more variable than for PUMAs with more SCBS observations.

Therefore, we conduct the factor analyses and regressions for 8 different sets of PUMAs – those with at least 10, 15, 20, 25, 35, 40, 45, 50, and 55 observations per PUMA. First, we find that for all of these 8 sets of PUMAs, the factor analysis remains essentially identical to the one reported in Table 4 (with 30 SCBS observations per PUMA, and 127 PUMAs). Factor loadings barely change if we have 291 PUMAs or 86. Second, we find that in some cases the regression results are actually strengthened, whereas in other cases weakened. For example, for those sets of PUMAs with fewer than 30 SCBS observations per PUMA, the regression estimations are weakened, with insignificant, fluctuating coefficients that are rarely in the predicted direction. However, for those sets of PUMAs with greater than 30 observations per PUMA, results are *strengthened* – coefficients are uniformly in the correct direction, of larger absolute magnitude than those currently reported in Table 7, and typically significant at a higher level than currently achieved. Therefore, we contend that our results are generally robust across different strategies for organizing the data, and that our current sample size is an appropriate and conservative one that achieves a balance between the stability of the variable score and statistical power for tests[xii].

5. Conclusions / Discussion

5.1 Summary of results

This study makes a unique contribution regarding the dimensionality and explanatory power of social capital. The evidence marshaled here supports our contentions that regional-level social capital is a multi-dimensional construct. Our findings are important for a number of reasons. First, they support the validity of social capital operationalizations for sub-national regions. Second, they are the first to empirically identify "bridging" and "bonding" dimensions Putnam

forecast. Thirdly, they provide insight into how to best describe and characterize the social structure of place.

Across our analyses we find social capital relating to growth in a consistent way – higher growth is associated with bridging social capital and lower growth with bonding social capital. Since these results are suggested in existing literature, we regard them as further validation of our "bridging" and "bonding" indices.

5.2 Future Research

In this study we uncovered several dimensions – bridging and bonding – along which existing social capital composite measures vary. Bridging social capital is a combination of inclusive groups, diversity of friendships, and electoral political engagement, while bonding social capital is a combination of exclusive groups and faith-based engagement. Additionally, we find bridging social capital relating positively and bonding negatively to measures of regional growth – as forecast by existing theory. However, current theory is not sufficiently nuanced to identify the underlying mechanisms linking bridging and bonding to regional-level growth, and our analyses do not specifically test any such understanding. Therefore, it remains for future research to provide both a theoretical and empirical elaboration of these mechanisms.

Relatedly, until we have a better understanding of these underlying mechanisms, it is difficult to construct meaningful hypotheses regarding other questions of interest such as whether and how bridging and bonding interact to effect regional growth, and whether they are substitutable under certain circumstances. Our current regressions are additive, and as such look for the

relationships between growth and bridging holding bonding constant (and vice versa). Yet, we might suggest that the relationship between bridging and regional growth varies depending on the "level" of bonding social capital. It is also possible that one dimension of social capital can "fill in" for low levels of another. Although we might tentatively guess that high levels of bonding might interfere with or mitigate the effects of high levels of bridging on growth, in order to properly explore these questions we first need a more carefully considered conceptualization of the mechanisms relating bridging, bonding, and growth.

Furthermore, our analyses confirm the existence of social capital sub-dimensions and call attention to the need to more systematically measure them. For example, we would prefer to have an electoral politics composite index that was comprised of measures more indicative of activism and participation within the electoral arena, as opposed to measures indicative of knowledge of one's elected officials and interest in politics. This new measure would differ from both the current electoral politics composite index and the protest politics index.

Future research should also focus upon the various levels of social capital that can characterize a region. Currently, we have PUMA-level social capital for a limited number (127) of the total national PUMAs. We employ PUMAs as our unit of analysis because we suggest that social capital is a small geography phenomenon, and therefore by using a small geography like the PUMA we recover a more precise portrait of a region's social connections. Additionally, given the vagaries of the SCBS and Census data-sets, we achieved the largest sample size by employing the PUMA as compared to other potential geographies. However, PUMAs are unusual geographies. It therefore remains to probe whether the dimensionality that we observe

for PUMAs is still observable for other more common geographies, and especially as we move to larger aggregations like the MSA or State. Also, we should again point out that the SCBS is not a nationally representative data set, and instead is limited to those regions of the U.S. that paid to participate in the survey. Given the intriguing results we find in this study, further research is needed regarding the study's generalizability to more geographically representative social capital measures. To do that however, we need these social capital measures for all U.S. PUMAs, MSAs, counties, etc. Creative use of existing Census data (like measures in the PUMS or the Summary File 1, 2, or 3) might make possible the generation of these measures, and would therefore also make easier the afore-mentioned analyses with other geographies. Another limitation of the current study is the timing of the measures – the social capital data dates from the year 2000 while our economic variables measure growth over the years 1990 to 2000. We would prefer social capital data that temporally precede growth variables, and locating such data remains for future research.

5.3 Societal Implications

How might society use these results? First, this research is certainly of value to regions attempting to measure their "stock" of social capital. Whereas regions have traditionally regarded social capital monolithically, in light of our results they should begin to inject additional sophistication into their analyses. They should now understand that there are different types of social capital and that it is not unusual for a region to have much of one kind and little of another.

A final issue is whether society – presumably the state in this case – should be in the business of promoting certain kinds of social capital and restricting or discouraging others. The answer to this must certainly be *no*. For example, the Ku Klux Klan has existed for over a century, and clearly represents a form of social capital that does not embody norms and values of tolerance and openness. Its actions – even when perfectly legal and non-violent – have been destructive. Yet, the government correctly stops short of banning such organizations. The government should be fully committed to protecting the right to engage in all forms of social connections including those that engender tolerance and openness, while guarding against improper repression. As Woolcock (2000, p. 80) suggests "[t]he policy response to reading the social capital literature should not be a call for more choirs and soccer clubs, as writers satirizing Putnam have tended to infer." Indeed, such an inference would render our research trivial and boring. Instead, the primary novelty of the current work lies in empirically uncovering several of the social dimensions along which places differ, while also beginning to show that, as Woolcock (2001, p. 15) also claims, "…how we associate with each other, and on what terms, has enormous implications for our well-being…."

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Footnotes

[i] Since Census tract codes are not unique across states, in order to merge the two datasets we have to create a code that does uniquely identify a particular tract. To do this we concatenate the codes for state, county, county-subdivision, place, and tract. We have these codes for Census and the SCBS, and merge the data from the two sources using this concatenation. As we said above, about 15,000 of the 29,000 SCBS observations match with the Census, because of missing or incorrect state, county, county-subdivision, place, or tract codes in the SCBS.

[ii] We contend that a threshold of 30 observations per PUMA provides a stable estimate of the mean PUMA score while also providing an appropriate number of PUMAs to permit hypothesis testing and factor analyses. However, in section 4.3.2, we examine the robustness and sensitivity of our results to performing the analyses with sets of PUMAs with either more or less than 30 observations per PUMA.

[iii] See Appendix A for a list of the 127 PUMAs, their sample sizes, and the name of the "community" in which it sits.

[iv] See Appendix B for a fuller description of the component measures of these composites.

[v] We find that population growth and employment growth have a linear correlation of r=0.98. Therefore, of the two, we choose to employ only employment growth in our analyses.

[vi] Specifically, to calculate PUMA-level per capita income growth we did the following: First, multiply tract-level per capita income (for both years) by total population to get total income for all tracts. Second, we aggregate tract total income to PUMA-level total income, and aggregate tract population to PUMA-level population. Third, we divide PUMA-level total income by PUMA-level total population to get PUMA-level per capita income for each year. From those we then calculate growth. Note that for all 4 growth measures we employed the 1990 data, but aggregated to the 2000 PUMA definitions. This way, we have consistent geographies across years.

[vii] We estimate *average* median housing values for all PUMAs for each year – from which we then calculate growth. To do this we first multiply tract-level median housing value by 100% Housing Count (from the 2000 SF3 geoheader file and the 1990 Summary Tape File, data file 27) to get something approximating total housing value. Next, we aggregate this and 100% Housing Count to PUMA-level. We then divide PUMA-level "total" housing value by PUMA level housing count to get an approximate average-median-housing value for both 1990 and 2000. From these we can then calculate growth.

[viii] We actually only asked the raters to judge 17 of the 18 groups, "other groups" was omitted.

[ix] Although rated as an exclusive group, the involuntary nature of some labor union memberships raised concerns about clearly delineating the group along these dimensions ("exclusive" vs. "inclusive"). As a result, labor unions were excluded from the analysis. However, including labor unions as an exclusive group, as rated, did not significantly impact any results.

[x] The two new group measures – inclusive and exclusive groups – each achieve construct validity. Two separate factor analyses on the constituent variables comprising the indices each obtain a single factor with positive loadings on all measures. Additionally, the other six SCBS composite indices all also achieve construct validity in the same way. Finally, by its nature we should expect some of the constituent measures of the Diversity of Friendships index to negatively inter-relate, and since they do we suggest construct validity obtains for this composite as well.

[xi] Note that the two-factor confirmatory factor analysis had the best fit when electoral politics was excluded. Both of the models tested above exclude this measure.

[xii] Results from these analyses are available upon request.

Tables and Findings

Table 1: Summary Statistics at PUMA level (n=127)

	Mean	Median	Std. Dev.	Max.	Min.
Population Growth	0.248	0.221	0.248	1.334	-0.129
Employment Growth	0.242	0.197	0.251	1.320	-0.153
Income Growth	0.426	0.412	0.083	0.785	0.250
M. H.V. Growth[a]	0.445	0.455	0.209	1.026	-0.044
Human Capital	0.307	0.273	0.139	0.741	0.083
Social Trust	0.013	0.045	0.217	0.486	-0.595
Diversity of Friendships	6.349	6.313	0.527	8.211	5.109
Group Involvement.	3.169	3.164	0.419	4.509	2.029
Faith-Based Engagement	-0.104	-0.108	0.209	0.392	-0.593
Giving and Volunteering	5.128	5.101	0.742	6.942	3.185
Electoral Politics	3.088	3.088	0.340	4.052	2.171
Protest Politics	1.215	1.135	0.366	2.719	0.603

[a]M.H.V. = Median Housing Value

Table 2: Principal Factor Analysis of "Group Involvement" index measures with Varimax rotation, PUMA level (n = 127)

Rotated Factor Pattern

	Factor 1	Factor 2	Factor 3
Social Welfare Groups	0.542	0.235	0.151
Art/Literary Groups	0.599	0.494	-0.112
Professional Groups	0.269	0.734	-0.015
Hobby Groups	0.383	0.608	-0.029
Political Groups	0.614	0.293	-0.409
Neighborhood Orgs.	0.509	0.103	0.076
Athletic/Sports Groups	-0.055	0.491	-0.001
Ethnic/Civil Rights Orgs.	0.648	0.019	-0.042
Internet Groups	0.406	0.223	-0.174
PTA / PTO	-0.086	-0.080	0.656
Youth Groups	-0.218	0.116	0.606
Religious Groups	0.101	-0.226	0.287
Elderly Groups	0.085	-0.114	0.317
Fraternal Orgs	0.054	0.086	0.187
Self-Help Groups	0.317	-0.029	0.422
Veterans Groups	-0.276	-0.026	0.060
Labor Unions	0.070	0.029	-0.018
Other Groups	0.123	0.496	-0.021
Eigenvalue	3.557	2.061	0.965
% of Variance	0.485	0.281	0.132

Table 3: Inter-rater reliability of the categorization of 17 "group" measures

Group Name	Agreement[a]	Percent Agreement	Priors[b]
Religious Groups	14 "yes" / 15 raters	93.33%	"yes"
Elderly Groups	14 "yes" / 15 raters	93.33%	"yes"
Fraternal Orgs.	14 "yes" / 15 raters	93.33%	"yes"
Hobby Groups	13 "no" / 14 raters	92.86%	"no"
Youth Groups	13 "yes" / 15 raters	86.67%	"yes"
Internet Groups	11 "no" / 13 raters	84.62%	"no"
Art/Literary Groups	12 "no" / 15 raters	80.00%	"no"
Labor Unions	12 "yes" / 15 raters	80.00%	"yes"
Self-Help Groups	10 "no" / 13 raters	76.92%	"yes"
PTA / PTO	11 "yes" / 15 raters	73.33%	"yes"
Veterans Groups	11 "yes" / 15 raters	73.33%	"yes"
Professional Groups	11 "yes" / 15 raters	73.33%	"no"
Social Welfare Groups	11 "no" / 15 raters	73.33%	"no"
Political Groups	10 "no" / 15 raters	66.67%	"no"
Ethnic/Civil Rights Orgs.	8 "yes" / 15 raters	53.33%	"no"
Athletic/Sports Groups	8 "no" / 15 raters	53.33%	"no"
Neighborhood Orgs.	8 "no" / 15 raters	53.33%	"no"

[a]The rater responded "yes" if they judged there to by any restrictions for membership or participation in that type of group, and "no" if they judged there to be no restrictions.

[b]These were the authors' ratings as judged before the "experts" ratings were known. As seen above, there is concordance between the authors' ratings and the experts' modal response for 14 of the 17 groups, and for all groups with percent agreement above 80.00%.

Table 4: Principal Factor Analysis with Varimax rotation, PUMA level (n = 127)

Factor Pattern

	Factor 1	Factor 2
Diversity of Friendships	0.699	-0.242
Exclusive Groups	-0.026	0.819
Inclusive Groups	0.721	-0.191
Faith-Based Engagement	-0.221	0.825
Electoral Politics	0.691	0.067
Eigenvalue	1.959	1.026
Percent Variance	0.775	0.406

Table 5: Correlations between Human Capital and SCBS measures, PUMA level (n=127)

	Human Capital
Diversity of Friendships	0.529*
Exclusive Groups	-0.329*
Inclusive Groups	0.579*
Faith-Based Engagement	-0.402*
Electoral Politics	0.526*

*p<0.05

Table 6: Confirmatory Factor Analysis for various factor structures, PUMA level (n=127)

Model	χ^2	df	IFI	TLI	NFI	RMSEA
One-factor	45.24**	2	0.768	0.289	0.760	0.414
Two-factor	0.174	1	1.004	1.027	0.999	0.000

Note: ** indicates significant at $p < 0.01$. IFI = incremental fit index; TFI = Tucker-Lewis index; NFI = normed fit index; RMSEA = root-mean-square error approximation.

Table 7: Least Squares Regression of Growth on VARIMAX - rotated Factors with "Regional" Fixed Effects, PUMA level (n = 127)

	Income Growth	Employment Growth	M.H.V Growth[a]
"Bridging" Social Capital	0.0167*	0.0130	0.000
"Bonding" Social Capital	-0.0321***	-0.0104	-0.0279*
Human Capital	0.283***	0.287*	0.586***
log(per capita income 90)	-0.114***		
log(total employment 90)		-0.448***	
log(avg. median hv 90)			-0.254***
Urban / Rural	-0.0154**	-0.0187	-0.00954
R – Squared	0.316	0.409	0.611

* p<0.10 **p<0.05   ***p<0.01   (One-tailed significance test)
[a]M.H.V. Growth = Median Housing Value Growth

Table 8: Sample Size Sensitivity

Threshold[a]	Number of PUMAs[b]
10 SCBS observations	291
15 SCBS observations	221
20 SCBS observations	172
25 SCBS observations	151
30 SCBS observations	127[c]
35 SCBS observations	114
40 SCBS observations	106
45 SCBS observations	101
50 SCBS observations	93
55 SCBS observations	86

[a]There are least this many SCBS observations per PUMA
[b]This number of PUMAs meets this threshold
[c]Sample size used in main analyses

Appendix A

127 PUMAs used in analyses

	STPUMA	PUMA Name	2000 Population	SCBS "Community"
1	0100901	Birmingham City (part)	103629	Greater Birmingham, AL
2	0100902	Birmingham City (part)	123233	Greater Birmingham, AL
3	0100903	Birmingham City (part)	153921	Greater Birmingham, AL
4	0100904	Birmingham City (part)	185656	Greater Birmingham, AL
5	0100905	Bessemer City (part)	95608	Greater Birmingham, AL
6	0400106	Tempe City (part)	163902	Maricopa County, AZ
7	0400120	Chandler City (part)	189676	Maricopa County, AZ
8	0602201	San Francisco City (part)	136975	City and County of San Francisco, CA
9	0602202	San Francisco City (part)	107285	City and County of San Francisco, CA
10	0602203	San Francisco City (part)	107054	City and County of San Francisco, CA
11	0602204	San Francisco City (part)	109355	City and County of San Francisco, CA
12	0602205	San Francisco City (part)	105532	City and County of San Francisco, CA
13	0602206	San Francisco City (part)	105194	City and County of San Francisco, CA
14	0602301	Daly City (part)	140752	Silicon Valley, CA
15	0602303	San Mateo City (part)	100602	Silicon Valley, CA
16	0602304	San Mateo City (part)	129848	Silicon Valley, CA
17	0602305	Belmont City	146543	Silicon Valley, CA
18	0602309	Fremont City (part)	181534	Silicon Valley, CA
19	0602701	Los Altos City (part)	114867	Silicon Valley, CA
20	0602702	Mountain View City (part)	205545	Silicon Valley, CA
21	0602703	Santa Clara City (part)	108439	Silicon Valley, CA
22	0602707	Cupertino City (part)	126866	Silicon Valley, CA
23	0602708	San Jose City (part)	126838	Silicon Valley, CA
24	0602709	San Jose City (part)	116043	Silicon Valley, CA
25	0602710	San Jose City (part)	142324	Silicon Valley, CA
26	0602711	Cambrian Park CDP	100883	Silicon Valley, CA
27	0602712	San Jose City (part)	103304	Silicon Valley, CA
28	0608101	San Diego City (part)	216925	San Diego County, CA
29	0608109	San Diego City (part)	230212	San Diego County, CA
30	0800802	Longmont City, (part)	113092	Boulder County, CO
31	0800803	Boulder City (part)	107227	Boulder County, CO
32	0800812	Denver City (part)	117406	City and County of Denver

33	0800813	Denver City (part)	100089	City and County of Denver
34	0800814	Denver City (part)	100910	City and County of Denver
35	0800815	Denver City (part)	142364	City and County of Denver
36	0800816	Denver City (part)	114985	City and County of Denver
37	1000101	Elsmere Town	78052	Kent, New Castle, and Sussex County, and Wilmington DE
38	1000103	Wilmington City (part)	194727	Kent, New Castle, and Sussex County, and Wilmington DE
39	1000200	Dover City (part)	126697	Kent, New Castle, and Sussex County, and Wilmington DE
40	1301104	Atlanta City (part)	104024	Greater Atlanta, GA
41	1703403	Mount Prospect Village (part)	252722	Chicago Metro
42	2102400	Covington City	151464	Cincinnati Metro
43	2201501	Baton Rouge City (part)	89603	East Baton Rouge Parish
44	2201502	Baton Rouge City (part)	138215	East Baton Rouge Parish
45	2300700	Auburn City (part)	103793	Lewiston – Auburn, ME
46	2503301	Boston City (part)	105352	City of Boston, MA
47	2503302	Boston City (part)	129578	City of Boston, MA
48	2503303	Boston City (part)	121523	City of Boston, MA
49	2503304	Boston City (part)	110606	City of Boston, MA
50	2503305	Boston City (part)	122082	City of Boston, MA
51	2601100	Fremont City	178104	Newaygo, MI
52	2601300	Grand Rapids City	197800	City of Grand Rapids, MI
53	2601403	Walker City	132258	City of Grand Rapids, MI
54	2602601	Kalamazoo City (part)	128445	Kalamazoo County, MI
55	2602602	Westwook CDP	186421	Kalamazoo County, MI
56	2701301	Minneapolis City (part)	133155	Minneapolis, MN
57	2701303	Minneapolis City (part)	125382	Minneapolis, MN
58	2701501	St Paul City (part)	165028	St Paul, MN Metro
59	2701502	St Paul City (part)	122123	St Paul, MN Metro
60	2701601	Shoreview City	77087	St Paul, MN Metro
61	2701602	Maplewood City	146987	St Paul, MN Metro
62	3000200	Great Falls City	145879	State of Montana
63	3000400	Billings City	129352	State of Montana
64	3000700	Missoula City	135756	State of Montana
65	3300500	Keene City	114283	State of New Hampshire
66	3300800	Manchester City	107006	State of New Hampshire
67	3300900	Nashua City	116893	State of New Hampshire

68	3600700	Syracuse City	147306	Onondaga County, NY
69	3600803	Fairmount CDP (part)	134303	Onondaga County, NY
70	3600901	Rochester City (part)	105203	Rochester, NY Metro
71	3600902	Rochester City (part)	114570	Rochester, NY Metro
72	3601001	Irondequoit CDP (part)	118511	Rochester, NY Metro
73	3601004	Brighton CDP (part)	166584	Rochester, NY Metro
74	3601100	Geneva City (part)	100224	Rochester, NY Metro
75	3601300	Batavia City	104541	Rochester, NY Metro
76	3700901	Charlotte City (part)	100238	Charlotte, NC (14 county region)
77	3700902	Charlotte City (part)	102718	Charlotte, NC (14 county region)
78	3700903	Charlotte City (part)	103408	Charlotte, NC (14 county region)
79	3700904	Charlotte City (part)	100665	Charlotte, NC (14 county region)
80	3700905	Charlotte City (part)	133799	Charlotte, NC (14 county region)
81	3701100	Gastonia City	254145	Charlotte, NC (14 county region)
82	3701200	Salisbury City	130340	Charlotte, NC (14 county region)
83	3701300	Kannapolis City (part)	131063	Charlotte, NC (14 county region)
84	3701500	Statesville City	122660	Charlotte, NC (14 county region)
85	3701601	Greensboro City (part)	101134	Greensboro / Guilford Co., NC
86	3701602	Greensboro City (part)	122757	Greensboro / Guilford Co., NC
87	3701700	High Point City (part)	197158	Greensboro / Guilford Co., NC
88	3701800	Winston-Salem City	185776	Winston-Salem / Forsyth Co., NC
89	3701900	Clemmons Village	120291	Winston-Salem / Forsyth Co., NC
90	3702500	Wadesboro Town	110197	Charlotte, NC (14 county region)
91	3800100	Mandan City	109043	Bismarck, ND
92	3800200	Bismarck City	194982	Bismarck, ND
93	3900601	North Olmstead City	121180	Cleveland, OH (Cuyahoga County)
94	3900602	Berea City	129959	Cleveland, OH (Cuyahoga County)
95	3900603	Cleveland City (part)	116527	Cleveland, OH (Cuyahoga County)

96	3900604	Parma City	107431	Cleveland, OH (Cuyahoga County)
97	3900605	Broadview Heights City	125623	Cleveland, OH (Cuyahoga County)
98	3900606	Cleveland City (part)	102936	Cleveland, OH (Cuyahoga County)
99	3900607	Cleveland City (part)	137949	Cleveland, OH (Cuyahoga County)
100	3900608	Cleveland City (part)	133914	Cleveland, OH (Cuyahoga County)
101	3900609	Bedford City	108325	Cleveland, OH (Cuyahoga County)
102	3900610	Cleveland Heights City	106580	Cleveland, OH (Cuyahoga County)
103	3900611	Euclid City	101344	Cleveland, OH (Cuyahoga County)
104	3900612	Lyndhurst City	102210	Cleveland, OH (Cuyahoga County)
105	3904301	Middletown City (part)	136384	Cincinnati Metro
106	3904302	Hamilton City	196423	Cincinnati Metro
107	3904402	North College Hill City	149868	Cincinnati Metro
108	3904403	Norwood City	134091	Cincinnati Metro
109	3904404	Loveland City	124130	Cincinnati Metro
110	3904501	Cincinnati City (part)	123557	Cincinnati Metro
111	3904502	Cincinnati City (part)	104712	Cincinnati Metro
112	3904503	Cincinnati City (part)	103016	Cincinnati Metro
113	4100200	Prineville City	106719	Central Oregon
114	4100400	Bend City	115367	Central Oregon
115	4203202	Hanover Borough	167845	York County, PA
116	4203203	East York CDP (part)	106591	York County, PA
117	4500500	Rock Hill City	164614	Charlotte, NC (14 county region)
118	4701400	Knoxville City	173890	East Tennessee
119	5300901	Grandview City	100341	Yakima, WA
120	5300902	Selah City	122240	Yakima, WA
121	5301801	Seattle City (part)	126999	Seattle, WA
122	5301802	Seattle City (part)	109697	Seattle, WA
123	5301803	Seattle City (part)	103992	Seattle, WA
124	5301804	Seattle City (part)	102596	Seattle, WA
125	5301805	Seattle City (part)	120090	Seattle, WA
126	5302005	Burien City	118696	Seattle, WA
127	5400800	Charleston City	287527	Kanawha Valley, WV

Appendix B

Component variables of Social Capital Composite Indices

I. Social Trust Composite Index

As noted by The Roper Center, this index is calculated as the mean of the standardized responses to the following questions:

   i) Generally speaking do you think that most people can be trusted or that you can't be too careful?

   How much can you trust:
   ii) people in your neighborhood? (a lot, some, a little, not at all)
   iii) people you work with?
   iv) fellow religious congregants?
   v) store clerks?
   vi) local police?

II. Diversity of Friendships Composite Index

As again noted by Roper, this index is a count of how many different kinds of personal friends the respondent has amongst the following set of 11 types of people:

Do you have a personal friend who:
   i) owns their own business?
   ii) is a manual worker?
   iii) has been on welfare?
   iv) owns a vacation home?
   v) has a different religious orientation?
   vi) is white?
   vii) is black?
   viii) is latino or Hispanic?
   ix) is asian?
   x) is gay or lesbian?
   xii) you would describe as a community leader?

III. Group Involvement Composite Index

This index is calculated as a count of yes answers to the following questions:

Have you been involved in the past 12 months with:
   i) any organization affiliated with religion, such as the Knights of Columbus, B'nai Brith, or a bible study group? [grprel]
   ii) an adult sports club or league, or an outdoor activity club? [grpsport]
   iii) a youth organization like youth sports leagues, the scouts, 4-H clubs, and Boys and Girls clubs? [grpyouth]

iv) a parents' association, like the PTA or PTO, or other school support or service groups? [grppta]

v) a veterans' group? [grpvet]

vi) a neighborhood association, like a block association, a homeowner or tenant association, or a crime watch group? [grpnei]

vii) clubs or organizations for senior citizens or older people? [grpeld]

viii) a charity or social welfare organization that provides services in such fields as health or service to the needy? [grpsoc]

ix) a labor union? [grplab]

x) a professional, trade, farm, or business organization? [grpprof]

xi) service clubs or fraternal organizations such as the Lions or Kiwanis or a local women's club or a college fraternity or sorority? [grpfrat]

xii) ethnic, nationality, or civil rights organizations, such as the National Organization for Women, the Mexican American Legal Defense, or the NAACP? [grpeth]

xiii) other public interest groups, political action groups, political clubs, or party committees? [grppol]

xiv) a literary, art, discussion, or study group, or a musical, dancing, or singing group? [grpart]

xv) any other hobby, investment, or garden club or society? [grphob]

xvi) a support group or self-help program for people of specific illnesses, disabilities, problems, or addictions, or for their families? [grphelp]

xvii) any group that meets only over the internet? [grpwww]

xviii) any other kinds of clubs or organizations? [grpothr]

IV. Faith Based Engagement Composite Index

This index is the mean of the standardized responses to the following 6 questions:

i) are you a member of a local church, synagogue, or other religious or spiritual community?

ii) not including weddings and funerals, how often do you attend religious services?

iii) in the past 12 months, have you taken part in any sort of activity with people at your church or place of worship other than attending services? This might include teaching Sunday school, serving on a committee, attending choir rehearsal, retreat, or other things?

iv) have you been involved in the last 12 months in any organization affiliated with religion, such as the Knights of Columbus or B'nai Brith, or a bible study group?

v) during the past 12 months, approximately how much money did you and the other family members in your household contribute to all religious causes including your local religious congregation?

vi) have you done any volunteer work for your place of worship in the past 12 months?

V. Giving and Volunteering Composite Index
This index is calculated as the mean of the responses to the following questions:

In the past 12 months have you done any volunteer work for:
      i) any arts or cultural organizations?
      ii) health care or fighting particular diseases?
      iii) any neighborhood or civic group?
      iv) your place of worship?
      v) school or youth groups?
      vi) any organization to help the poor or elderly?

vii) How many times in the past 12 months have you volunteered?
viii) During the past 12 months, approximately how much money did you and the other
    family members in your household contribute to all religious causes including your
    local religious congregation?
ix) During the past 12 months, approximately how much money did you and the other
    family members in your household contribute to all non-religious charities,
    organizations, or causes?

VI. Electoral Politics Composite Index
This index is calculated as the mean of the responses to the following questions:

i) Did you vote in the presidential election in 1996 when Bill Clinton ran against Bob
   Dole and Ross Perot, or did you skip that one?
ii) Are you currently registered to vote?
iii) How interested are you in politics and national affairs?
iv) Could you tell me the names of the two U.S. Senators from your state?
v) How many days in the past week did you read a daily newspaper?

VII. Protest Politics Composite Index
This index is calculated as the mean of the responses to the following questions:

i) Have you signed a petition in the past 12 months?
ii) Have you attended a political rally in the past 12 months?
iii) Have you participated in any demonstrations, protests, boycotts, or marches in the
    past 12 months?
iv) Did any of the groups that you are involved with take any local action for social or
    political reform in the past 12 months?
In the past 12 months have you participated in:
v) other public interest groups, political action groups, political clubs, or party
    committees?
vi) ethnic, nationality, or civil rights organizations, such as the National Organization for
    Women, the Mexican American Legal Defense, or the NAACP?
vii) a labor union?