Supplementary Information: Whose Social Capital?

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This document provides further details and justification for some of the analytic decisions made in the primary manuscript. We also provide some additional ancillary descriptive characteristics of our analytic corpus and results.[1]

Network Construction

First, some basic information about the scope of the corpus and constructed networks.

- Number of papers in corpus: 21,160
- Total citations: 985,749 (to 533,111 unique papers)
- Giant component (Harary 1969) size in citation network: 546,159
    - this drops 4,073 papers from focal corpus
- Citations in GC: 981,875 (to 529,244 unique papers)

Identifying Key Papers

Next, here are the identified "key papers" (those receiving >1000 citations from within the corpus; the *least* cited of these is cited by >5% of *all* papers in the corpus) and the umber of citations each received from within the corpus, sorted by number of citations received:

Citation	Cites
Coleman (1988)	4095
Putnam (2000)	3594
Putnam (1993)	2802
Portes (1998)	2289
Granovetter (1973)	2157
Nahapiet and Ghoshal (1998)	2113
Coleman (1990)	2097
Bourdieu (1986)	2090
Putnam (1995)	1785
Adler and Kwon (2002)	1609
Lin (2001)	1220
Burt (1992)	1062

Alphabetized:

Citation	Cites
Adler and Kwon (2002)	1609
Bourdieu (1986)	2090

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[1]Code for all analyses can be found at: https://github.com/jimiadams/SocialCapital-Viz.

Citation	Cites
Burt (1992)	1062
Coleman (1990)	2097
Coleman (1988)	4095
Granovetter (1973)	2157
Lin (2001)	1220
Nahapiet and Ghoshal (1998)	2113
Portes (1998)	2289
Putnam (2000)	3594
Putnam (1995)	1785
Putnam (1993)	2802

Given that two of these papers are not primarily original theorization of the social capital concept, but review papers summarizing its application in particular fields, the prominence of their citations in those fields (and central role in defining 2 of the clusters described in the manuscript itself) provides additional evidence of a pattern of citation "hijacking" by review articles as described by McMahan and McFarland (2021).

Estimating Community Structure

For conducting the community structure analyses on this citation network, the paper presents results using (Blondel et al. 2008), but we also ran all analyses using (Clauset, Newman, and Moore 2004). In the summaries in this SI, we include both, and also elaborate the demonstrated similarities and differences between these strategies. After applying the community detection algorithms on the citation giant component, we have:

- Number of papers in components size>10k
  - louvain solution: 304,163
  - fast-greedy solution: 307,977

The modularity-maximized solutions identify 6 (Louvain) and 5 (fast greedy) communities respectively containing >1000 papers in each, and each these provide *clear* cut-points, as is common graph theoretically (e.g., the next largest component in the Louvain solution has 389 papers, while in the fast-greedy solution it contains fewer than 50 papers). Within those components, the largest clusters include respectively (N, %) of the papers from the focal corpus:

Louvain Solution

Cluster	Papers	% of Corpus
1	2516	11.9
2	2319	11.0
3	2212	10.5
4	1514	7.2
5	1449	6.8
6	1210	5.7
Total	11220	53

Fast-Greedy Solution

Cluster	Papers	% of Corpus
1	3980	18.8
2	3060	14.5

Cluster	Papers	% of Corpus
3	2692	12.7
4	1485	7.0
5	754	3.6
Total	11971	56

Across these clusters, the key papers collectively receive the following number of citations:[2]

- Louvain solution - {7149 4090 3467 3263 3626 3106}
- fast greedy solution - {9363 8433 4320 3202 933}

Exploring the *content* of the clusters

To provide some short-hand labels for discussing the results here in a more readily parsimonious way, I finally examined for the citing papers within each of the identified communities the distributions of their (1) journals' ISI subject categories, (2) author provided keywords, and (3) ISI-provided keywords.

This warrants an important caveat; these are *not* intended as providing systematic potential accounts of the sources of the differences identified here; that would require more detailed analytic strategies that are beyond the scope of this analysis and paper. These are merely meant to provide heurisitc labels that are more intelligible than arbitrary numeric labels, for ease of discussion in the manuscript.

That interpretive caveat having been established, below, we provide the top subject categories and keywords for each of the community solutions, to illustrate how the preliminary labels were generated. (Sorry for the lazy formatting.)

```
##    comm        label                    dat
## 1      1 management journal categories
## [1] "management | business; management | business | education & educational
     research | information science & library science | information science &
     library science; management | economics | computer science , information
     systems; information science & library science; management | green &
     sustainable science & technology; environmental sciences; environmental
     studies | psychology , applied; management | economics; environmental
     studies; geography; regional & urban planning | computer science ,
     information systems; information science & library science | business;
     economics; management | sociology | business; development studies |
     business; regional & urban planning | business , finance | public
     administration | business; engineering , industrial; management | business;
      psychology , applied; management"
##    comm label               dat
## 2           author keywords
## [1] " | social capital | social capital | social | capital | human capital
     | innovation | social networks | trust | knowledge sharing | networks |
     entrepreneurship | innovation | social capital theory | entrepreneurship |
      knowledge | performance | china | social network analysis | performance |
      intellectual capital | networks | social network | knowledge management |
      knowledge sharing | social networks | firm performance | human capital |
     intellectual capital | china | networking | social media | absorptive
     capacity | knowledge transfer | network | knowledge management | trust |
     leadership | organizational | internationalization | analysis |
```

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[2]The paper-specific citations can be found in the top panel of Figure 1 in the manuscript, and the [solution_name]_cites object in the .Rda files in the GitHub repo data folder.

```
       collaboration | guanxi | smes | structural holes | capital theory |
       management | family firms | resource-based view | relationships"
##   comm label        dat
## 3          ISI keywords
## [1] " | performance | networks | knowledge | trust | innovation | impact |
    management | model | performance | creation | firm | perspective |
    embeddedness | firms | determinants | antecedents | ties | firm
    performance | capabilities | organizations | business | growth | behavior
    | networks | technology | absorptive-capacity | knowledge | strategy |
    work | governance | entrepreneurship | success | resources | competitive
    advantage | information | integration | innovation | research-and-
    development | strength | collaboration | weak ties | commitment | power |
    structural holes | absorptive-capacity | moderating role | management |
    consequences | communities"
## [1] "_____"
##   comm                label                dat
## 4      2 governance & development journal categories
## [1] "economics | sociology | development studies; economics | geography |
    development studies | environmental studies | environmental sciences |
    geography; regional & urban planning | political science | business |
    social sciences, interdisciplinary | business, finance | green &
    sustainable science & technology; environmental sciences; environmental
    studies | ecology; environmental studies | multidisciplinary sciences |
    urban studies | development studies; regional & urban planning |
    agriculture, multidisciplinary | development studies; environmental
    studies; regional & urban planning; sociology | forestry"
##   comm label          dat
## 5          author keywords
## [1] "social capital |  | social capital | social | trust | capital | social
     networks | collective action | trust | governance | human capital |
    community | gender | institutions | climate change | development | rural |
     economic growth | resilience | collective action | rural development |
    networks | cooperation | poverty | sustainability | adaptation |
    development | india | participation | vulnerability | africa | adaptive
    capacity | china | ethiopia | food security | climate change | economic
    development | livelihoods | religion | adaptation | governance | networks
    | culture | adaptive capacity | africa | microfinance | social networks |
    indonesia | innovation | social network analysis"
##   comm label          dat
## 6          ISI keywords
## [1] " | trust | management | policy | networks | impact | participation |
    governance | institutions | community | determinants | growth |
    conservation | adaptation | framework | risk | poverty | resilience |
    performance | management | culture | health | trust | behavior |
    collective action | systems | collective action | information | lessons |
    politics | vulnerability | adoption | cooperation | knowledge | model |
    climate-change | farmers | quality | governance | state | community |
    attitudes | comanagement | government | organizations | origins | power |
    participation | gender | income"
## [1] "_____"
##   comm  label                dat
## 7      3 health journal categories
## [1] "public, environmental & occupational health | public, environmental &
    occupational health; social sciences, biomedical | psychiatry |
```

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          multidisciplinary sciences | environmental sciences; public, environmental
           & occupational health | medicine, general & internal | social work |
          gerontology | health care sciences & services; health policy & services |
          health policy & services; public, environmental & occupational health |
          social sciences, interdisciplinary | social sciences, interdisciplinary;
          sociology | public, environmental & occupational health; medicine, general
           & internal | nursing | public, environmental & occupational health;
          psychology, multidisciplinary; social work | sociology | psychology,
          clinical | psychology, social | geriatrics & gerontology; gerontology;
          psychiatry | geriatrics & gerontology"
##    comm label                dat
## 8            author keywords
## [1] "social capital |  | social capital | social | health | mental health |
           self-rated health | capital | trust | social support | health | social
          networks | sweden | depression | community | social participation | china
          | gender | multilevel analysis | neighborhood | older adults | social
          cohesion | quality of life | hiv | neighbourhood | health promotion |
          physical activity | mental health | japan | older people | depression |
          income inequality | poverty | public health | usa | health inequalities |
          mortality | socioeconomic status | south africa | participation |
          participation | social determinants | adolescents | multilevel | urban |
          women | adolescents | depressive symptoms | empowerment | epidemiology"
##    comm label          dat
## 9            ISI keywords
## [1] " | health | self-rated health | mortality | community | support |
          association | mental-health | risk | income inequality | multilevel
          analysis | health | population | participation | people | multilevel |
          neighborhood | networks | depression | life | public-health | care |
          united-states | determinants | women | income inequality | prevalence |
          stress | mental-health | impact | environment | adults | behavior |
          children | trust | inequality | community | quality-of-life | context |
          inequalities | adolescents | crime | income | physical-activity |
          mortality | prevention | risk-factors | association | political-economy |
          associations"
## [1] "_____"
##     comm                         label                    dat
## 10    4 education, childhood, & adolescence journal categories
## [1] "education & educational research | sociology | social sciences,
          interdisciplinary | education & educational research; sociology |
          psychology, developmental | social work | criminology & penology | family
          studies; social work | economics | business | education & educational
          research; urban studies | public, environmental & occupational health |
          family studies | management | social issues; social sciences,
          interdisciplinary; sociology | demography | geography | public,
          environmental & occupational health; psychology, multidisciplinary; social
           work | social sciences, interdisciplinary; sociology | psychology,
          multidisciplinary"
##    comm label                dat
## 11            author keywords
## [1] "social capital |  | social capital | social | capital | cultural
          capital | education | social networks | human capital | trust | gender |
          higher education | resilience | cultural capital | development | social
          network analysis | youth | education | adolescence | community | identity
           | adolescents | children | china | family | inequality | social class |
```

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      young people | collaboration | networks | race | rural | adolescents |
      academic achievement | ethnicity | networks | bourdieu | poverty | school
      | social support | children | gender | trust | educational attainment |
      families | schools | social capital theory | higher education | human
      capital | poverty"
##    comm label          dat
## 12          ISI keywords
## [1] " | students | children | networks | school | achievement | family |
      education | impact | health | support | youth | adolescents | involvement
      | behavior | gender | inequality | participation | race | community |
      experiences | academic−achievement | outcomes | risk | performance |
      families | model | transition | crime | success | knowledge | achievement
      | attainment | context | women | culture | life | policy | trust | ties |
      work | engagement | framework | perceptions | resources | college |
      poverty | united−states | students | home"
## [1] "_____"
##    comm                        label                    dat
## 13    5 (online) civic engagement journal categories
## [1] "political science | communication | sociology | psychology,
      multidisciplinary; psychology, experimental | economics | social sciences,
      interdisciplinary; sociology | education & educational research | social
      issues | communication; information science & library science | psychology
      , social | psychology, clinical; social sciences, interdisciplinary |
      social sciences, interdisciplinary | information science & library science
      | communication; sociology | business | psychology, multidisciplinary |
      computer science, cybernetics; ergonomics | psychology, multidisciplinary;
      social sciences, interdisciplinary | computer science, information
      systems; information science & library science | computer science,
      interdisciplinary applications; information science & library science;
      social sciences, interdisciplinary"
##    comm label          dat
## 14          author keywords
## [1] "social capital |  | social capital | social | trust | capital | social
      media | facebook | social networks | social trust | facebook | social
      media | civic engagement | happiness | subjective well−being | trust |
      political participation | life satisfaction | internet | well−being |
      civic engagement | community | social networking sites | social support |
      social network sites | internet | subjective well−being | social network |
      social networking sites | digital divide | political | life satisfaction
      | bridging social capital | democracy | generalized trust | voluntary
      associations | volunteering | civil society | participation | bridging |
      ethnic diversity | generalized trust | happiness | immigration |
      institutions | china | civic | communication | online social capital |
      computer−mediated communication"
##    comm label          dat
## 15          ISI keywords
## [1] " | trust | communication | participation | internet | community |
      online | networks | impact | facebook | health | life | support | media |
      information | democracy | context | happiness | participation | diversity
      | ties | satisfaction | behavior | internet use | model | consequences |
      attitudes | engagement | friends | civil−society | technology |
      personality | state | sites | europe | communities | government | students
      | communication | civic engagement | internet use | culture | politics |
      united−states | political−participation | models | television | work |
```

```
               internet | income"
## [1] "_____"
##     comm                   label                  dat
## 16     6 migration & community journal categories
## [1] "sociology | demography | demography; ethnic studies | education &
    educational research | ethnic studies; sociology | social sciences,
    interdisciplinary | anthropology; sociology | economics | geography |
    management | business | social issues | political science | social work |
    religion | sociology; religion | area studies | social issues; social
    sciences, interdisciplinary | ethnic studies | psychology, applied"
##     comm label               dat
## 17             author keywords
## [1] "social capital | | social capital | social networks | social |
    capital | migration | gender | social networks | networks | human capital
    | cultural capital | migration | trust | networks | immigrants |
    employment | labour market | religion | entrepreneurship | community |
    integration | immigration | bourdieu | refugees | china | women |
    education | ethnicity | inequality | job search | social network | social
    support | immigrants | civil society | poverty | bourdieu | assimilation |
    australia | health | immigrant | immigration | transnationalism | youth |
    analysis | employment | income | political participation | unemployment |
    well-being"
##     comm label               dat
## 18             ISI keywords
## [1] " | networks | resources | gender | ties | employment | migration |
    immigrants | health | race | networks | migrants | impact | community |
    family | mobility | determinants | support | migration | earnings | job |
    performance | women | social networks | international migration |
    inequality | work | united-states | integration | participation | labor-
    market | organizations | united-states | diversity | model | strength |
    embeddedness | labor-market | income | outcomes | trust | experiences |
    management | immigration | policy | poverty | education | patterns |
    contacts | assimilation"
```

It's worth noting that while the number and size of communities differs a bit between the solutions, there are similar differences across communities in terms of citation distributions and co-citation patterns. Moreover, in this labeling exercise, the heuristic labels for these communities have substantial overlap, with 4 of the communities strongly aligning across each, and the labels of the fifth in the fast greedy solution seem to have been distributed over two communities in the louvain solution. Again, these are relatively simplisitic means of assigning those labels, so should not be overly-interpreted, however the similarities between them again speaks to the robustness of the general pattern being described in the manuscript.

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