Disconnected geography: A spatial analysis of disconnected youth in the United States

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Abstract:

Since the Great Recession, US policy and advocacy groups have sought to better understand its effect on a group of especially vulnerable young adults who are not enrolled in school or training programs and not participating in the labor market, so called 'disconnected youth.' This article distinguishes between disconnected youth and unemployed youth and examines the spatial clustering of these two groups across counties in the US. The focus is to ascertain whether there are differences in underlying contextual factors among groups of counties that are mutually exclusive and spatially disparate (non-adjacent), comprising two types of spatial clusters – high rates of disconnected youth and high rates of unemployed youth. Using restricted, household-level census data inside the Census Research Data Center (RDC) under special permission by the US Census Bureau, we were able to define these two groups using detailed household questionnaires that are not available to researchers outside the RDC. The geospatial patterns in the two types of clusters suggest that places with high concentrations of disconnected youth are distinctly different in terms of underlying characteristics from places with high concentrations of unemployed youth. These differences include, among other things, arrests for synthetic drug production, enclaves of poor in rural areas, persistent poverty in areas, educational attainment in the populace, children in poverty, persons without health insurance, the social capital index, and elders who receive disability benefits. This article provides some preliminary evidence regarding the social forces underlying the two types of observed geospatial clusters and discusses how they differ.

Keywords: NEETs | disconnected youth | opportunity youth | geographic concentration

Article:

Introduction

Since the end of the Great Recession in June 2009, US policy and advocacy groups have sought to better understand the long-term social consequences of the recession along a number of dimensions. Understanding such consequences is especially important given the anemic ensuing recovery that has been characterized by persistent high unemployment. Particularly hard hit have been young adults between the ages of 16 and 24. As of July 2015, the unemployment rate

among US youth ages 16 to 24 was 12.2 % (Bureau of Labor Statistics 2015a), compared with 4.3 % among adults over the age of 25 (Bureau of Labor Statistics 2015b). However, even this stark statistic hides the true depth of the problem. Nearly 9 % of American youth are chronic disconnected youth (Belfield et al. 2012), which is defined here and elsewhere in the literature to include the long-term unemployed as well as those that have dropped out of the labor force or educational or training opportunities altogether.

Disconnected youth have garnered increasing attention in the US since the start of the Great Recession (Belfield et al. 2012; Burd-Sharps and Lewis 2012; Lewis and Burd-Sharps 2013), but a definitive understanding of the scope of the problem is complicated by at least two issues. First, the research literature uses many names for these youths: disconnected youth (Fernandes and Gabe 2009; Burd-Sharps and Lewis 2012; Lewis and Burd-Sharps 2013); opportunity youth (Belfield et al. 2012); disengaged youth (Levine 2005); or NEET for not in employment, education or training (Bynner and Parsons 2002; Popham 2003).

Second, and the focus of this article, is a failure to clearly distinguish between disconnected youth and unemployed youth when attempting to characterize the geographic distribution of disconnected youth. Following standard Bureau of Labor Statistics (BLS) definitions, the term "unemployed youth" refers to those youths who do not have either a full- or part-time job but are actively looking for employment. Those not employed and not looking for work are considered out of the labor force, a term that includes college students, youths in vocational training programs, parents voluntarily focusing on childcare, eldercare, or home work, and youths who have disconnected from the labor market or educational opportunities. Disconnected youth may also be engaged in illicit or other commerce (day labor for cash) that is not reported. We posit in this article that it is important to distinguish disconnected youth, who are a subset of those that are out of the labor force, from the BLS-defined unemployed youth when examining the geographic distribution of disconnected youth as many policy reports do (e.g., Burd-Sharps and Lewis 2012; Lewis and Burd-Sharps 2013). By comparing social conditions across areas dominated by these two different categories of youth, insights may be gained regarding how opportunities for all youth may be improved.

To this end, we explored the geographic dispersion of youth split into two categories: 1) those who are unemployed per the standard BLS definition (unemployed youth) and those who have disconnected from both the labor market and educational opportunities (disconnected youth). Using data from the US Census Bureau's American Community Survey, we compared where these two types of youth cluster geographically in the US to help federal and local policy makers better understand local resource needs. The focus is on the differences in the types of local conditions that are associated with observed high rates of disconnected youth or unemployed youth. To this end, we used local indicators of spatial association tests to identify mutually exclusive, geographically disparate regions. Places where clusters of unemployed and disconnected youth co-occur geographically are removed from the analysis, and places where the clusters are contiguous are also dropped, to sharpen the distinction between the underlying factors in the two types of places. Removing the areas of actual or potential (through contiguity) overlap sharpens the distinction between the two types of areas, thus more starkly contrasting differences that may help in the definition of local policies to better meet the needs of one group versus the other.

We find that disconnected youth and unemployed youth are clustered in geographically disparate areas, suggesting that these are distinct labor force categories. Furthermore, we found significant differences in a variety of social harm measures between counties with high rates of disconnected youth and counties with high rates of unemployed youth. Although our results cannot be interpreted as causal, they suggest that policymakers in counties with high rates of disconnected youth face a very different set of policy challenges than do policymaker sin counties with high rates of unemployed youth.

Background

As evidenced by the lack of consensus on a name for the phenomenon of disconnected youth, many issues remain unresolved in the disconnected youth research literature. Some studies refer to young people who are simply unemployed (e.g., Bell and Blanchflower 2011), while others refer to young people who are not in employment, education or training (usually referred to as NEETs; e.g., Bynner and Parsons 2002; Eurofund 2012). This latter group lives in a marginalized position in society and receives little social support or recognition compared with unemployed youth. Much of the research on disconnected youth has focused on Europe and, to a lesser extent, Asia. In the US most of the research on disconnected youth has appeared in policy reports rather than the peer-reviewed literature, although a related literature in the US has examined declining labor force participation rates and the geographic mobility of the youth labor force.

International Studies

Internationally, disconnected youth have been subject to negative media attention much of which has been aimed at influencing social policies. European and Japanese media have highlighted the social relevance of disconnected youth by often labeling them as antisocial and economically useless. Disconnected youth are characterized as spearheading an anti-labor youth subculture marked by an unwillingness to assume responsibility (Popham 2003; Inui 2005). An article in the Dutch newspaper *Touw*, reporting on the 2012 Eurofund report on disconnected youth (referred to as NEETs in the article) concluded by referencing the behavior of disconnected youth as "couch potatoes" and their cost to Europe "Fourteen million young people sitting at home doing nothing in Europe" (de Werd 2012).

In the international literature the discussion of disconnected youth reflects how expansive a concept it has become and how the term NEET is utilized to combine categories of labor and social exclusion. In addition to identifying the many groups of young people at risk of becoming disconnected youth, the international literature reiterates a number of common themes. It is often assumed that young people whose parents have low educational attainment and whose parental socioeconomic status is low (i.e., intergenerational impact) are the most likely to become disconnected youth (Britton et al. 2011). The literature in Japan (Genda 2007; Brinton 2010), Taiwan (Chen 2010), South Korea (Liang 2009), Australia (Black et al. 2010), New Zealand (Statistics New Zealand 2012) and to some extent the UK (Grist and Cheetham 2012) has also identified the "positive" disconnected youth phenomenon (disconnected youth out of individual choice rather than circumstance, i.e., "taking a year out").

Evaluations of European policies and empirical research focusing on the disconnected youth issue commonly centers on transitions and pathways in education as a means of explaining the disconnected youth phenomenon or alternatively as a means of ameliorating the problem (O'Reilly et al. 2015; Eurofund 2012; EUROSTAT 2011). However, the disconnected youth phenomenon is a multifaceted concept including heterogeneous labor market and social categories: active and inactive jobless; different social origins and levels of education; young people experiencing diverse life conditions and social risks. The generalized acceptance of standardized disconnected youth concepts and their associations are now coming under increasing scrutiny through analysis of the literature and empirical evidence. Of increasing concern has been the use of disconnected youth stereotypes in influencing the development of policies that are ineffective at best or detrimental at worst (Bruno et al. 2014).

Official statistics at the national and cross-national levels focus on disconnected youth in different age groups: ages 15–24, 15–19, 16–19 or 16–24. Until the most recent economic crisis, the literature had generally agreed that disconnected youth typically leave school before the formal national school leaving age. In the current global economic crisis, there appears to be a new trend emerging of disconnected youth who have completed tertiary education, which can range from vocational through to degree level (Institute for Public Policy Research 2010). That such a group is now appearing as disconnected youth challenges previously held views and evidence on the disconnected youth population and points to a growing diversity in their composition. Especially concerning is the potential for youth to transition from "simply" unemployed to disconnected youth due to a lack of employment opportunities.

One of the significant weak areas in the international disconnected youth literature has been the disregard of the social risk aspect among young people arising from working instability and fragmented working careers. Although labor market deregulation (Esping-Andersen and Regini 2000) has eased entry into employment, it has also had a negative impact on the prospects of achieving stable work and developing long-term career trajectories. Cavalca (2016) has shown that in Italy, for example, this process has increased social inequalities and risks of social exclusion as a consequence of lacking structural reforms of the welfare system.

Recent literature has shown how the Great Recession hit young people harder than other age cohorts, as usually happens during periods of economic downturn (Chzhen and Richardson 2014; Demidova et al. 2015; O'Higgins 2012). During these periods the level of disconnected youth shows an increasing persistence (Bruno et al. 2014). The crisis and scarring effects are longer lasting on young people than on adults (Cockx and Picchio 2013). The main factors influencing youth conditions are the lack of educational attainment, lack of working skills and job experience, and a long school-to-work transition and unstable jobs with few prospects (O'Higgins 2012; Scarpetta et al. 2010). The current recession has increased not only youth unemployment and the incidence of long-term unemployment but also the importance of temporary jobs, which in some countries have become the only form of new employment among young people (O'Higgins 2012; Kelly and McGuinness 2015). Temporary jobs are very often inadequate in terms of training content that is often provided (formally, at least) by other specific fixed-term contracts, such as apprenticeships, internships, or open-ended contracts (Quintini et al. 2007). Thus, unstable workers can be trapped in a cycle of instability that can transition to

unemployment or complete disconnection from the labor market. Two critical groups emerge from these recent empirical studies: the 'left behind' and the 'poorly integrated new entrants'. The first reflects their cumulated multiple disadvantages – lack of educational attainment and disadvantaged social origins. The latter group involves people with higher levels of educational attainment but who are unable to get a stable job position (Scarpetta and Sonnet 2012).

In addition to labor market conditions, the international literature has identified a variety of common risk factors for becoming disconnected youth. One key risk factor is a history of persistent truancy while in school, leading to low levels of educational attainment (Nelson and O'Donnell 2012; Bynner and Parsons 2002). Young care leavers and young care givers are another group at higher risk of being disconnected youth (Caulfield 1999; Dixon et al. 2006; Department for Children, Schools and Families 2007), although the size of this group depends on specific national policy provisions to keep them in education. A large group of young people at risk of becoming diconnected youth are those who need additional social support, including those with disabilities, learning needs, language/communication disorders, a broad spectrum of those identified with social/emotional needs, individuals whose first language is not the language commonly used in the state or who are not bilingual, and young asylum seekers who lack cultural and social capital (Department for Children, Schools and Families 2007).

Other groups identified as being at risk of becoming disconnected youth are those who have already been in trouble with the law and those with a history of drug/substance misuse (Yates and Payne 2006). Teenage parents similarly have a high risk of becoming disconnected youth (Caulfield 1999), and most evidence suggests that ethnic minorities are overrepresented among disconnected youth (Belfield et al. 2012; Fernandes and Gabe 2009). Disconnected youth are more prone to experience cultural disaffection, and in the case of ethnic minorities this has raised fears of social cohesion problems through the radicalization of marginalized disconnected youth (Briton et al. 2002; Basit 2009; Smeaton et al. 2010). The evidence is mixed on gender differences among disconnected youth. The general assumption is that young men are more likely to become disconnected youth, although some of the British evidence shows that there are very specific regional variations (Li et al. 2008; Fevre et al. 2009; Biletta and Eisner 2007). Studies of the regional variation in Britain generally fail to properly account spatial correlation, however, and so may not provide reliable evidence on true regional variations.

There is general agreement in the literature that the life course trajectory of disconnected youth is marked by poor outcomes on almost every measure. Disconnected youth are more likely than even the disadvantaged working or unemployed to be in long-term poverty (Sissons and Jones 2012). Their life course is often highlighted as being one of underachievement, although as noted above this is due to many factors including the early life course. Disconnected youth are more at risk of criminal behaviour or having a criminal record by the time they are 30 than the general population (Sissons and Jones 2012). A key outcome is the poor health experienced by disconnected youth, including poor self-esteem, depression and suicide (Sissons and Jones 2012). Investigation of the 1970 British Birth Cohort study (Bynner and Parsons 2002) has shown that being a disconnected youth for at least 6 months is likely to mean that by the age of 21 a young man is more than four times likely to be out of work, three times more likely to have depression and mental health issues, five times more likely to have a criminal record, and six times less likely to have an academic degree. A 10-years follow-up of disconnected youth using

the British Youth Cohort Study (Coles et al. 2010) has provided a profoundly more sobering summary than almost any other piece of research: of the long-term disconnected youth studied previously, 15 % were dead by the time the follow-up study was completed 10 years later.

US Studies

In contrast to the international focus on disconnected youth, relatively little attention has been paid to this group in the US. A growing number of policy reports suggest recognition of the disconnected youth phenomenon among US policymakers and youth advocates, but there is a surprising dearth of peer-reviewed literature focusing on disconnected youth in the US. Perhaps most surprising is the lack of US labor economic research on disconnected youth, despite a growing concern over declining labor force participation rates in general and among youth in particular.

Passed in 2009, the American Recovery and Reinvestment Act (ARRA) included provisions to assist struggling students and disconnected youth. Since then, federal US labor policy relevant to disconnected youth has focused on curbing youth unemployment through various programs such as JobCorps and YouthBuild. These programs collaborate with state and federal agencies to provide training and job placement for qualifying, low-income youth beginning at age sixteen (US Department of Labor 2013). In addition to specific federal programs, youth discretionary grants and youth formula-funded grant programs provide funding to states to address unemployment among at-risk populations (US Department of Labor 2016). While these programs tackle aspects of disconnected youth, namely targeting specific areas of the population and providing non-traditional training programs, the targeted population is specifically unemployed youth (Dworsky 2011). Thus, these programs provide resources after youth have suffered a job loss, as opposed to tackling factors that contribute to youth unemployment from the onset.

Beyond provisions in the ARRA, disconnected youth have increasingly appeared on the radar of national political campaigns. Opportunity Nation is a non-profit organization and national campaign that specifically targets disconnected youth. This bipartisan organization has worked with state and national governments to develop programs to create pathways for young adults in obtaining secondary and higher education or a non-traditional career pathway. Opportunity Nation organization has also developed an "Opportunity Index" which examines economic opportunity at the state and county level to promote tailor-made solutions, increase economic opportunity and mobility, and encourage partnerships among education institutions, employers, and local government within the community (Opportunity Nation 2016). Statewide initiatives have allowed collaboration between this organization and state legislatures in creating forums and developing programs based on the needs of the state. For example, Opportunity Iowa lead to the creation of a community map in Polk County, Iowa that advertised education and employment opportunities for individuals age 16 to 25 (Opportunity Iowa 2016).

The Clinton Foundation has also addressed the issue of disconnected youth. In 2014, during the Clinton Global Initiative America Meeting in Denver, former Secretary of State Hillary Clinton announced plans for Job One, an initiative to encourage private companies to expand training and hiring opportunities to "engage unemployed youth." Secretary Clinton acknowledged the

growing number of youth ages 16–24 who are unemployed and not seeking higher education as well as the cost these individuals place on both the private and public sector. She encouraged the development of partnered initiatives between the private and public sector to combat this issue (Kommareddi 2014).

State and local governments have taken steps to address the root causes of the disconnected youth phenomenon. Several states advocate for reinvigorating student interest in secondary education to increase opportunity for employment or continued higher education, and to reduce dropout rates (Burd-Sharps and Lewis 2012). States are also developing programs that incorporate technical education with traditional secondary academics. For example, California developed the Linked Learning Program to introduce secondary education students to job skills training programs that align with growing industries within the state (Linked Learning 2016). Massachusetts has increased the number of vocational-technical education programs to reflect the needs of the industries within that state. This program has combined public and private funding, and the students enrolled in these programs are more likely to continue on to higher education (Burd-Sharps and Lewis 2012). The city of Philadelphia created Project U-Turn to reconnect youth to secondary and higher education and provide career pathways. Since Project U-Turn's inception, the high school graduation rate in the city's school districts has increased by fourteen per cent, though insufficient funding poses a risk to the longevity of this program (Project U-Turn 2016).

Despite US policy efforts to address disconnected youth, there is a dearth of peer-reviewed literature on disconnected youth in the US, particularly in the economics literature. A preliminary systematic search on the terms "NEET," "opportunity youth," "disconnected youth," and "disengaged youth" in the EconLit database returned zero articles. A similar search of the National Bureau of Economic Research (NBER) working paper archive yielded zero working papers. Expanding the search to additional databases such as JSTOR or the OECD iLibrary provided some results, but not within the economics literature.

In general search databases, "disconnected youth" appeared most commonly with regards to the US labor market. The majority of the results from a variety of search engines did not produce peer-reviewed literature with quantitative analysis, however. Rather, most of the search results were papers or articles provided by national campaigns, organizations, or news articles. Many of the articles focused on youth employment, youth education, or a combination of the two with some reference to disconnected youth. "Disconnected youth" also appeared often in literature with an international focus, namely Europe, where a greater amount of peer-reviewed literature was available.

"Opportunity youth" did not appear to be associated with literature regarding the US labor market as the majority of resources were associated with research in the natural and social sciences. Labor economics was not often related to this term in the available literature. However, this term did appear in labor economics research in Europe, Africa, and East Asia, specifically focused on youth in the labor market of specific countries. In the majority of available literature regarding the US, "opportunity youth" was used in research mainly associated with health and civic engagement. "Disengaged youth" presented similar results with the literature focused primarily on civic engagement with virtually nothing associated with economics in general. "Not

in Education, Employment, or Training" or "NEETs" did not appear in the US economics literature. Research based in Ireland, the UK, and Europe in general used this term more commonly in regards to youth and the labor force. Most US research that used the term "NEET" was in the field of natural sciences where it was used in the context of NEET proteins, not the youth labor market.

Although disconnected youth, as a specific labor market category, has practically no peer-reviewed economic research in the US, a related body of work in the economics field suggests disconnected youth are of concern in the US. In particular, a literature has examined changes in the US labor force participation rate among various groups (e.g., Juhn 1992; Blau and Goodstein 2010; Van Zandweghe 2012; Hotchkiss and Rios-Avila 2013; Kudlyak 2013), including declines among youth specifically (e.g., Aaronson et al. 2006). Much of the recent literature on the US labor force participation rate has focused on the role of the Great Recession in explaining the acceleration in the decline in the labor force participation rate that has occurred since 2007. Most authors conclude that the labor force participation rate is slightly below the expected trend (Hotchkiss and Rios-Avila 2013), but some have concluded that the overall labor force participation rate may actually be above what should be expected given cyclical declines attributed to the Great Recession (Kudlyak 2013). Aaronson et al. (2014) conclude that much of the decline is due to structural changes in the labor force rather than to cyclical weakness.

Focusing specifically on the labor force participation of teenagers, Aaronson et al. (2006) note that labor force participation rates of US youth have been declining since the late 1970s, with a striking increase in the rate of decline between 2002 and 2003. They conclude that much of the initial decline can be explained by supply side factors, particularly rising rates of return to higher education. The decline between 2000 and 2003, however, was not as easily explained. They conclude that while the demand for teen labor may have softened over this time frame, the decline in teen labor force participation was not likely associated with labor market slack.

More recently, Aaronson et al. (2014) examined trends in the US labor force participation rate for teenager and young adults as part of a border examination of trends in labor force participation rates. Although trending down well before the Great Recession, the decline in the labor force participation of 16 to 24 year olds accelerated between 2007 and 2014 and accounts for about 20 % of the overall decline in the labor force over the time period. Although increasing participation in education, both on the extensive and intensive margin, explains part of the decline, Aaronson et al. (2014) conclude that rising school enrolment cannot explain all of it. They suggest that less-educated adult immigrants may be crowding out teen and young adult workers, but do not fully explain the decline in the labor force participation of 16 to 24 tear olds.

Summary

Given the dire plight of disconnected youth suggested by international studies, US policymakers at all levels are increasingly focusing on disconnected youth as a target for social welfare resources (Grant and Johnson 2009; US Department of Education 2011; Burd-Sharps and Lewis 2012; Lewis and Burd-Sharps 2013). Clearly, the resource needs of these youth vary depending on their labor force status. Disconnected youth who are actively seeking work, and therefore captured in traditional unemployment statistics, may benefit from longer

unemployment benefits, vocational training or expanded educational opportunities. However, disconnected youth who have disengaged from both educational and labor market opportunities are unlikely to use these forms of assistance and pose a more intractable problem for policymakers. These youth may need a broader policy effort that includes social welfare, training, criminal justice interventions, and health care, especially mental health and substance abuse care.

A first step for policy makers is to understand where these youth cluster geographically so that local governments can better understand the problem they face. To this end, this study used geospatial statistical techniques to identify areas where unemployed and disconnected youth cluster.

Data

Data are from the US Census Bureau's American Community Survey, which replaced the Long Form used in the 2000 decennial census. Previously, a panel of households was asked these same detailed questions regarding work, school, housing, income and demographics every 10 years as part of the decennial census data collection. With the American Community Survey, one-fifth of the panel of households is asked these same detailed questions every year. An advantage of this change is more timely information, while a disadvantage is smaller sample sizes in each year of data collection. This study used 5-years aggregates of the American Community Survey so that the measure reflects the entire panel of households in the household sample for each county. For this study, we used the American Community Survey household-level survey response data that are available only to approved researchers inside restricted Census Research Data Centers. Access to restricted data inside the Census Research Data Centers requires developing a proposal that describes what data will be used, how they will be examined, and how the results will be conveyed to readers outside of the RDC. The results from analysis must be examined and approved by RDC staff before they can be released from the RDC, which is a highly secured, closed research lab environment.

Definition of Disconnected Youth

Disconnected youth include individuals who are not in employment, education or training. This definition characterizes a particular form of economic inactivity. There is no consensus labor market definition of disconnected youth (Furlong 2006). Therefore, for this study we attempt to separate disconnected youth from unemployed youth to better distinguish the former group. We identified residents of households and group quarters between the ages of 16 and 24 who were unemployed youth (UY), defined as job seekers with no current employment, and those who were disconnected youth (DY), defined as not in the labor force and not attending a public or private school or college at any time during the 3 months prior to the time of interview[1]. To

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[1] Disconnected youth status was determined from the following American Community Survey questions:
   Age for persons from Question #4. What is Person's age and what is Person's date of birth?
   Employment Status for persons was derived from Questions #29 through 35. The American Community Survey was designed to identify the following sequence for civilians 16 and over:
   1. People who worked at any time during the reference week;
   2. People on temporary layoff who were available for work;

create these measures, we aggregated household respondents by county over 5 years and then divided by the total number of household respondents in the relevant age group (16–24). The outcome measures are the county-specific proportions of youths in this age group who were classified as DY or UY. We calculated these 5-years aggregates for two consecutive time periods: 2006–2010 and 2007–2011.

Correlates of Social Harm

Based on the findings from the literature reviewed above, we have included various factors that may be pertinent in understanding differences in places that are primarily hotspots for DY and those that are primarily hotspots for UY. These include county-level educational attainment, English language proficiency, residential segregation among minorities, demographic distribution by race or ethnicity, rural poverty enclaves by race or ethnicity, dependence on disability payments or other forms of social welfare, social capital measures, linguistic isolation and language proficiency, migratory influx of foreign born individuals, county-level arrest data for drug possession, trafficking, manufacturing, and runaway youth. In addition, we examine social support for families with dependent children and female-headed households, and prevalence of elderly females who live alone or disabled elderly persons. The data are drawn or derived from various sources including the US Census of Population and the American Community Survey, the Bureau Labor Statistics, the Bureau of Economic Analysis, the Economic Research Service of the US Department of Agriculture, and the FBI's Uniform Crime Reporting Program. The social capital data and index are from Penn State University social capital research program (Rupasingha et al. 2006). Measures of social harm are organized into the following categories: 1) Residential Segregation, Social Capital, Racial/Ethnic Distribution; 2) Poverty, Income, Educational Attainment, Unemployment, Uninsured Status; 3) Travel to Work, Migration, Urbanicity, Foreign Immigration, Language Ability; 4) Economic Dependence Typology Codes - Economic Research Service (USDA); 5) Public Assistance; and 6) Crime and Arrest Data (FBI Uniform Crime Reporting).

Methods

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3. People who did not work during the reference week but who had jobs or business from which they were temporarily absent (excluding layoff)
4. People who did not work during the reference week, but who were looking for work during the last 4 weeks and were available for work during the reference week, and
5. People who were not in the labor force.

We used "not in labor force" (5) and unemployed (next).

According to the American Community Survey, unemployed requires the following three characteristics:

1. People were neither "at work" nor "with a job but not at work" during the reference week
2. Were actively looking for work during the last 4 weeks
3. Were available to start a job.

The American Community Survey also includes civilians who did not work at all during the reference week, were waiting to be called back to a job from which they had been laid off, and were available to work except for temporary illness. The American Community Survey uses answers from Questions #35b, 35c, 36, and 37 to make this additional unemployment determination.

School enrollment for persons is derived from Question #10. At any time in the last 3 months, has this person attended school or college?

This study used a descriptive analysis of differences in communities where there are statistically significantly higher rates of DY versus other communities with statistically significantly higher rates of UY. First, spatial clustering statistics are used to identify these communities. Then, the communities identified are examined to remove any areas of overlap to sharpen the distinction between the two types of communities and ensure the two types of communities are spatially independent. Next, descriptive statistics are used to assess differences in underlying factors between these two different community types.

Spatial Cluster Analysis

To assess the presence of spatial clustering, we conducted a global test (Moran's I) followed by a set of Local Indicators of Spatial Association (LISA) tests. The global test is a univariate approach that hypothesizes a spatially random pattern of DY (or UY) rates among counties. The Moran's I statistic is based on a regression of each area's rate on the average rates of its neighbors, the so-called spatial lag, which is defined by a spatial weights matrix specifying who are neighbors to each county location. We used a first-order Queen contiguity approach to define neighbors as all counties that are touching anywhere or contiguous to (sharing a boundary with) the county of question. These neighbor weights are assigned for each county, the spatial lags are calculated, and the global test is performed. The slope of the regression of each county's rate against its spatial lag rate is the test statistic, with an associated t-statistic and p-value. The Moran's I test assumption of spatial randomness of disconnected youth is rejected when the slope of the county rate on its lag rate is statistically significant, suggesting the presence of some significant local spatial clustering in the rates.

With evidence from Moran's I of spatial clustering, the next step is to employ a series of local tests to examine where the local clustering occurs, and how it manifests across the landscape. Local tests are conducted separately for each county and test whether the correlation of the county's rate with its lag is significantly different from a random distribution of correlations among this county's rate with that of a randomly assigned group of "neighbors" (Anselin 1995). The GeoDa software used for these analyses allows for up to 9999 simulations of randomly chosen neighbors and their correlations of rates with each county in question (Anselin et al. 2006). The user also has latitude to set the level of significance for the tests. We used 9999 simulations to generate the distribution of correlations in the rates among sets of counties, and then chose a significance level of 0.01 to determine whether the actual correlation of a county and its real neighbors was so different from the random distribution of neighbors that it was extremely unlikely to have occurred by chance. Counties identified as being in the tails of this random distribution with less than 1 % of the probability remaining are indicated in the tests results for the LISA statistics on a map which displays all the counties. GeoDa's LISA test results identify the counties located at the center of each cluster (Anselin 1995). We mapped only the counties identified as centers of county spatial clusters and did not buffer these with their spatial neighbors as is sometimes done.

Refining the Two Groups of Counties for Subsequent Analysis

The two types of cluster hotspots were primarily in different types of regions, as only about 10 % overlap was initially found in the two types of clusters. We sharpened the distinction between the

two types of areas by removal of the areas of actual or potential (through contiguity) overlap, to better understand those differences that may help in the definition of local policies, which can be tailored to better meet the needs of one group versus the other.

To heighten the contrast between these two types of hotspots, all overlapping counties were removed from analysis of differences in underlying characteristics in DY and UY hotspot counties. Also, any buffering counties – those that lie in-between the identified hotspots – were removed. The logic is that, using a Queen weights matrix, the identified county and those touching it are part of a local cluster. The weights ended at the first order of contiguity – that is, neighbors of neighbors were assumed to have no influence. Therefore, when a DY and a UY cluster are adjacent, a one-county buffer is needed to ensure that there is no overlap in the two different clusters.

From among 3061 counties in the contiguous United States, 433 were identified as spatial clusters of high rates (aka hotspots) for one or both types of youth. After removal of 46 counties that were spatial clusters of high rates for both DY and UY, 387 counties remained representing mutually exclusive groups of spatial clusters of the two types. Of these, 238 were identified as spatial clusters of high rates of DY, and 149 were identified as spatial clusters of high rates of UY. Next, 35 of these were removed that were members of one type but had a location spatially contiguous to members of the other type. Their removal resulted in a total spatial separation of these clusters by at least one degree of contiguity. The remaining 206 DY hotspot counties, and 146 UY hotspot counties, comprise about 58 and 42 % of the hotspot areas, respectively.

Tests of Differences across the Two Groups

Once the mutually exclusive and spatially disparate sets of DY and UY counties were identified, we compared and contrasted underlying characteristics of these two groups of counties using *t*-tests of equal means. We used standard t-tests because our intent is to describe and contrast the geographic cluster of DY and UY in an effort to better inform policy and motivate future research on disconnected youth in the US. We decided that standard *t*-tests would be more accessible to policy makers and provide hypothesis generating information to researchers that was unburdened by the statistical assumptions that underlie more complex methods of comparing one group of counties to another.

To re-iterate, the two groups compared are 1) counties that are the geographic centers of statistically significant spatial clusters of counties with higher than average DY rates and 2) counties that are the geographic centers of statistically significant spatial clusters of counties with higher than average UY rates. All overlapping DY and UY clusters were removed, and counties that are between adjacent clusters are removed so that there is no overlap or first-order contiguity in these two groups of clusters. Had we not removed these overlapping and buffering counties from the defined groups, there might have been some spatial correlation in the contextual factors across the groups due to having some buffering counties in common. This would have violated an assumption of the standard *t*-test: independence in the distribution of the variable being compared across the two groups.

Results

We found strong evidence of global clustering, with a Moran's I statistic of 0.652, a t-statistic of 74.4, and a *p*-value of 0.000 for the DY data, and a Moran's I statistic of 0.563, a t-statistic of 62.2, and a *p*-value of 0.000 for the UY data.

Figures 1 and 2 show the results of the Local Indicators of Spatial Association tests (i.e., the spatial distribution of statistically significant DY and UY spatial clusters in each year, before removal of overlapping DY and UY clusters. In these maps, the black areas are counties central to statistically significant hotspots, and the medium grey counties are counties central to statistically significant coolspots. Dark grey and light grey designate counties that exhibit the opposite pattern from an adjacent cluster. The three neighborless counties are islands off the coast of the continental US, and were excluded from the analysis. DY hotspots appear to be concentrated in the Southwest, Deep South, and Appalachian region, while coolspots appear to be clustered in the Northeast and upper Midwest. UY hotspots are more spread out than the DY hotspots, but do appear to have a small concentration in the Deep South along the Mississippi River basin.

Figure 3 shows the counties where there is coincidence of DY and UY clusters and identifies those disparate areas where these clusters do not coincide, prior to the removal of overlapping DY and UY clusters. The black areas are the DY hotspots, the dark grey areas are the UY hotspots, and the light grey areas are hotspots for both types of rates. Figure 3 reveals very few counties that are hotspots for both DY and UY. In fact, only about 10 % of counties are both DY and UY hotspots.

Comparisons of contextual variables in DY hotspot counties with UY hotspot counties, after removal of overlapping DY and UY clusters, are shown in Table 1. We see significant differences across these two types of areas in the underlying socio-ecological variables. Both independent sample and pooled variance *t*-tests were conducted. Significance at the .01 level or better is indicated with a single asterisk, while significance at the .05 level or better is indicated with a double asterisk, and significance at the .10 level or better is indicated with a triple asterisk. Given the large number of tests conducted, we focus on significance at the .01 level.
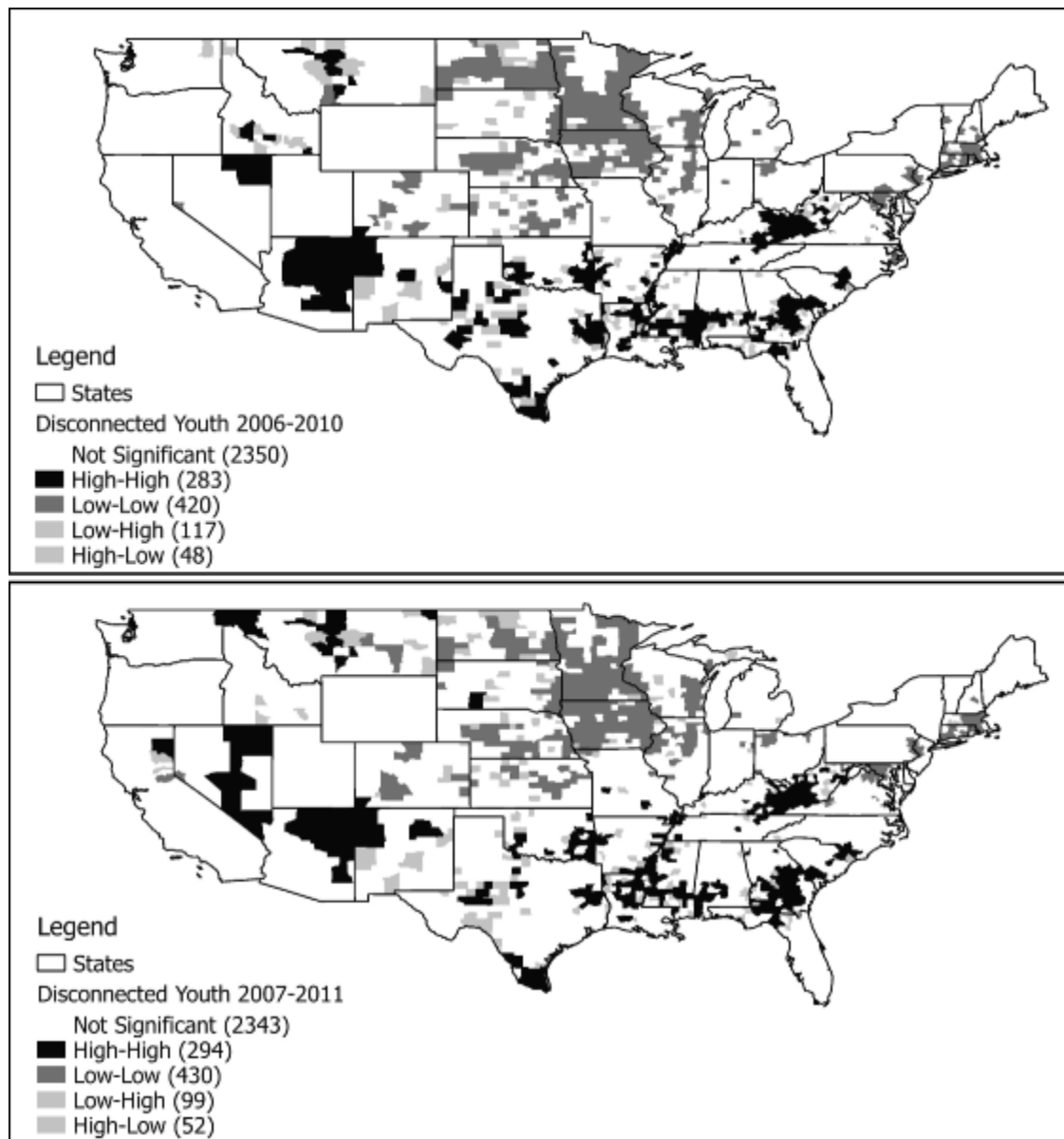
Fig. 1. Disconnected Youth (DY) Spatial Clusters. Note: Spatial clusters identified using local indicators of spatial association (LISA) tests. Black areas are counties central to spatial clusters with statistically significantly higher rates of DY than expected by chance (i.e., hotspots). Dark grey counties are counties central to spatial clusters with statistically significantly lower rates of DY than expected by chance (i.e., coolspots). Medium grey and light grey designate counties that exhibit the opposite pattern from an adjacent cluster
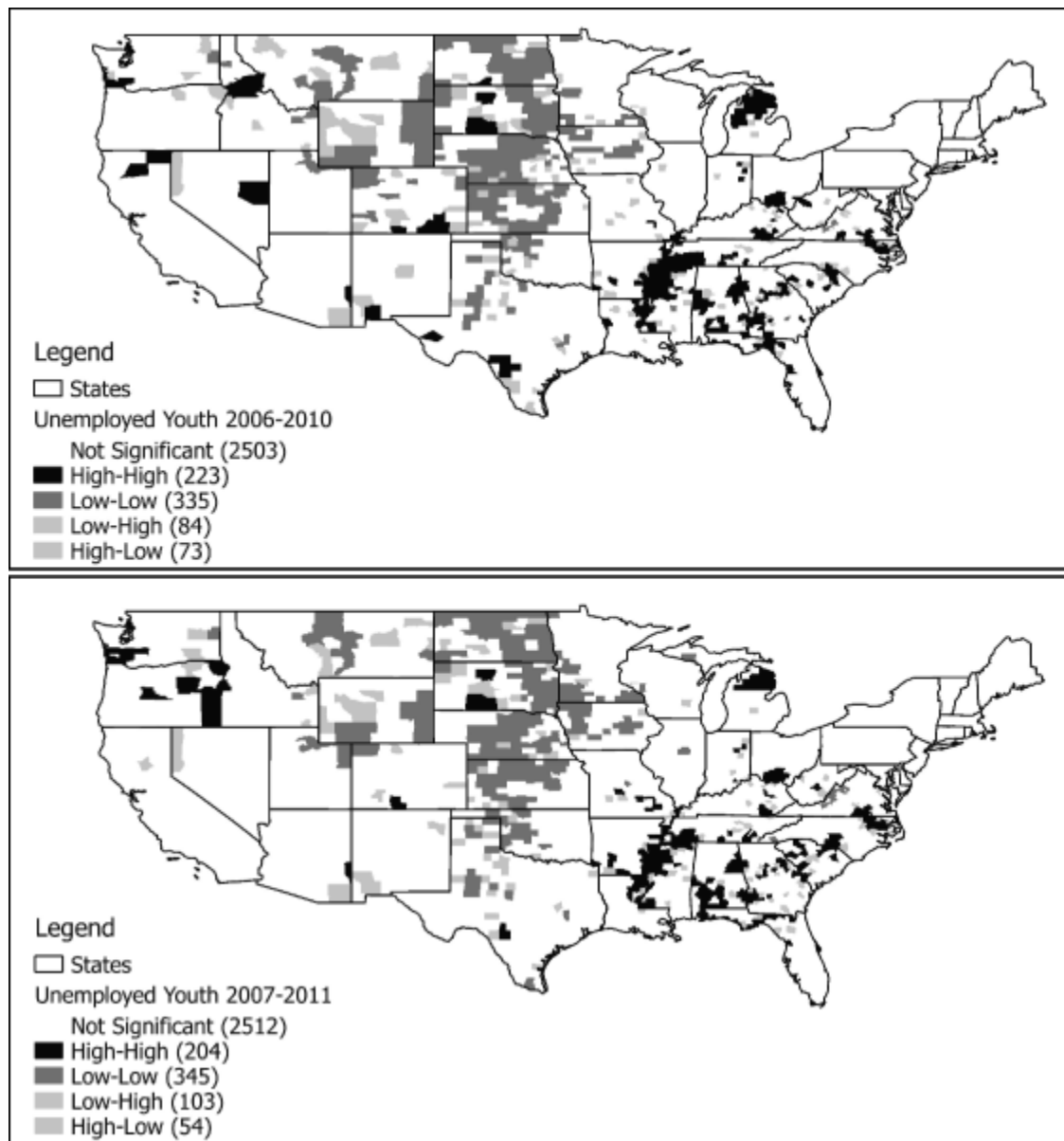
Fig. 2. Unemployed Youth (UY) Spatial Clusters. Note: Spatial clusters identified using local indicators of spatial association (LISA) tests. Black areas are counties central to spatial clusters with statistically significantly higher rates of UY than expected by chance (i.e., hotspots). Dark grey counties are counties central to spatial clusters with statistically significantly lower rates of UY than expected by chance (i.e., coolspots). Medium grey and light grey designate counties that exhibit the opposite pattern from an adjacent cluster
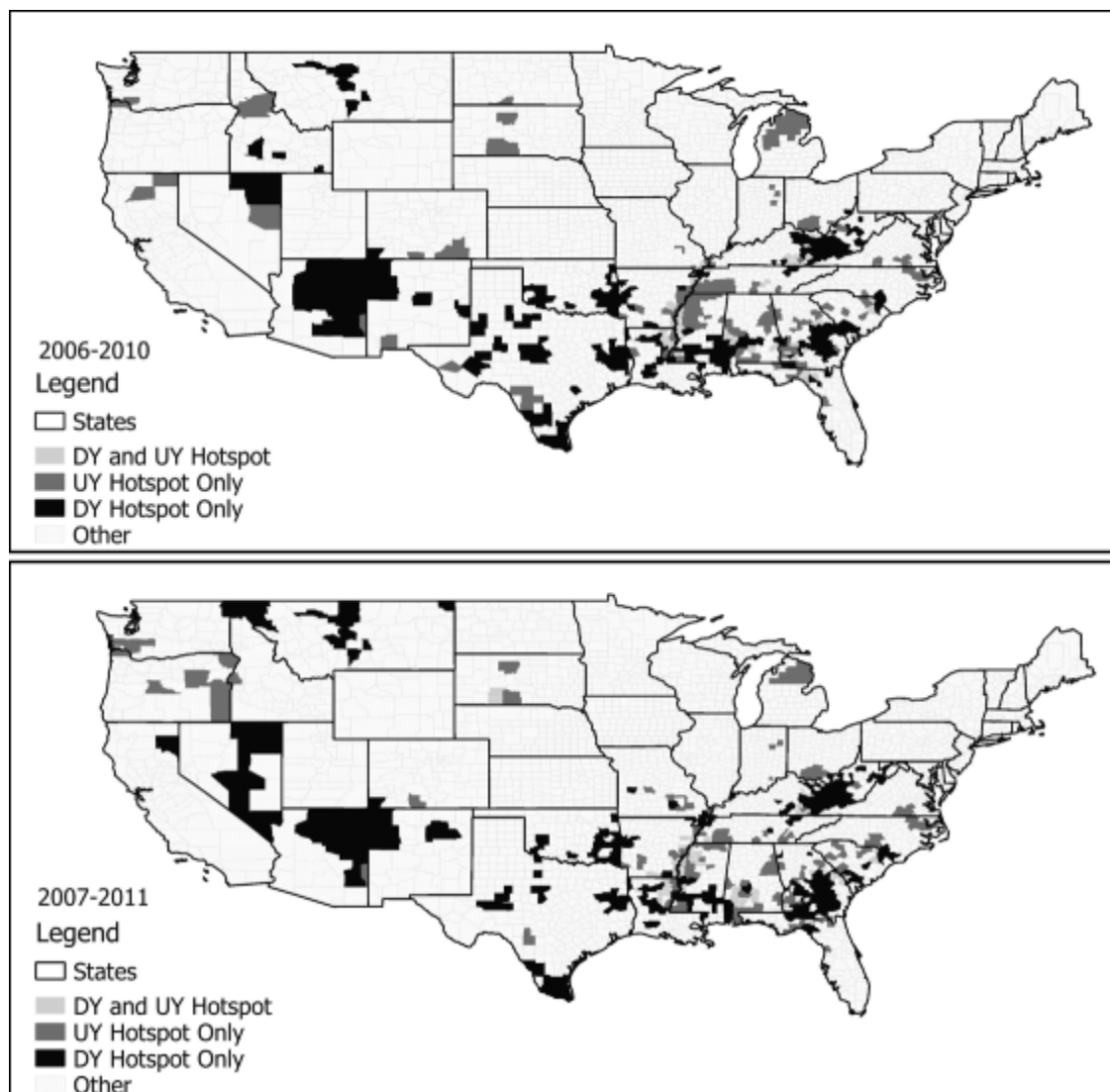
Fig. 3. Comparison of Disconnected Youth (DY) and Unemployed Youth (UY) Hotspots and Their Coincidence. Note: Spatial clusters identified using local indicators of spatial association (LISA) tests. Black areas are counties central to spatial clusters with statistically significantly higher rates of DY, but not UY, than expected by chance (i.e., DY hotspots). Dark grey counties are counties central to spatial clusters with statistically significantly higher rates of UY, but not DY, than expected by chance (i.e., UY hotspots). Light grey designates counties that are in both DY and UY hotspot spatial clusters

Table 1. Comparison of means in contextual factors across two mutually exclusive and spatially disparate groups of counties reflecting spatial clusters in high rates of disconnected youth (DY) and unemployed youth (UY)

Year of variable construction	Variable description	Mean for disconnected youth (DY) hotspot counties, 2007 ($N = 206$)	Mean for unemployed youth (UY) hotspot counties, 2007 ($N = 146$)	t-test for comparison of means, pooled sample significance	t-test for comparison of means, independent sample significance
Residential Segregation, Social Capital, Racial/Ethnic Distribution					
2005–2009	Diversity index (Theil Index): measures the evenness or unevenness of the spatial distribution of population subgroups in tracts within areas (counties).	0.116	0.102		
2005–2009	Isolation index: probability that American Indians and Alaska Natives will meet other American Indians and Alaska Natives	0.057	0.027	**	**
2005–2009	Isolation index: probability that Asians will meet other Asians	0.014	0.013		
2005–2009	Isolation index: probability that blacks will meet other blacks	0.187	0.284	*	*
2005–2009	Isolation index: probability that Hispanics will meet other Hispanics	0.124	0.059	*	*
2005	Composite Social Capital Index in 2005 (Z score)	−1.152	−0.653	*	*
2005	Bowling centers in 2005	0.447	0.596	***	***
2005	Civic and social associations in 2005	3.354	3.603		
2005	Physical fitness facilities in 2005	3.131	3.062		
2005	Labor organizations in 2005	1.84	1.65		
2007	Number of fitness and recreation centers in a county divided by number of county residents (2007)	0.063	0.08	***	***
2005	Religious organizations in 2005	26.02	33.08	***	
2005	Sports clubs, managers, and promoters in 2005	0.068	0.055		
2008	Percentage of population that was American Indian or Alaska Native in 2008	3.08	1.90		
2008	Percentage of population that was Asian in 2008	0.456	0.449		
2008	Percentage of population that was of Hispanic origin in 2008	9.947	3.964	*	*
2008	Percentage of population that was African-American in 2008	14.006	23.283	*	*
2008	Percentage of population that was non-Hispanic white in 2008	71.357	69.398		

Year of variable construction	Variable description	Mean for disconnected youth (DY) hotspot counties, 2007 (N=206)	Mean for unemployed youth (UY) hotspot counties, 2007 (N=146)	t-test for comparison of means, pooled sample significance	t-test for comparison of means, independent sample significance
2008	Percentage of population that was Hawaiian or Pacific Islander in 2008	0.022	0.010	***	**
Poverty, Income, Educational Attainment, Unemployment, Uninsured Status					
2005	% of people of all ages in poverty for income year 2005	22.435	20.707	**	**
2000	Proportion of total persons age 65+ with income below the federal poverty level	0.178	0.163	**	**
2000	Counties where the poverty rate of children under age 18 was 20 % or more in 1970, 1980, 1990, and 2000	0.694	0.50	*	*
1979–2005	Persistent poverty 1979–2005	0.301	0.233	**	**
2005–2009	% total population for whom poverty data exist who are black and rural	4.634	7.286	*	*
2005–2009	% total population for whom poverty data exist who are black and urban	0.387	0.959	**	**
2005–2009	% total population for whom poverty data exist who are Hispanic and rural	2.174	0.910	*	*
2005–2009	% total population for whom poverty data exist who are Hispanic and urban	0.637	0.213		***
2005–2009	% total population for whom poverty data exist who are white and rural	12.03	9.67	*	*
2005–2009	% total population for whom poverty data exist who are white and urban	0.543	0.630		
2005	Median household income	30795	33119	*	*
2005–2009	Proportion of population aged 25+ years with less than a high school diploma or equivalent	0.251	0.231	*	*
2005–2009	Proportion of population aged 25+ years with a graduate or professional degree	0.047	0.048		
2005	Unemployment rate, age 16+	6.132	6.927	*	*
2005	Percentage uninsured	20.226	16.268	*	*
Travel to Work, Migration, Urbanicity, Foreign Immigration, Language Ability					
2005–2009	Proportion of workforce that did not work at home that travelled 60+ minutes to work	0.067	0.052	*	*
2005–2009	Proportion of population that lives in a different state than did last year	0.087	0.089		
2000	Proportion of population residing in rural areas of the county in 2000	0.699	0.692		

Year of variable construction	Variable description	Mean for disconnected youth (DY) hotspot counties, 2007 ($N=206$)	Mean for unemployed youth (UY) hotspot counties, 2007 ($N=146$)	t-test for comparison of means, pooled sample significance	t-test for comparison of means, independent sample significance
2000	Proportion of adults who speak poor or no English	0.022	0.009	*	*
2000	Proportion of households that are linguistically isolated (non-English speaking)	0.024	0.008	*	*
2000	Proportion of population who are foreign born	0.029	0.016	*	*
2000	Proportion of population who are foreign born and immigrated to the US in the past 5 years	0.008	0.005	*	*
Economic Dependence Typology Codes - Economic Research Service (USDA)					
2004	Farming-dependent County Typology Code	0.135	0.075	**	**
1999	Economic Research Service natural amenity index (1999)	3.69	3.51	**	**
2004	Federal/State Government-dependent County Typology Code	0.015	0.068	**	**
2004	Housing Stress Typology Code	0.243	0.240		
2004	Low Education Typology Code	0.519	0.479		
2004	Low Employment Typology Code	0.471	0.342	**	**
2004	Manufacturing-dependent Typology Code	0.223	0.452	*	*
2004	Mining-dependent County Typology Code	0.146	0.027	*	*
2004	Nonspecialized-dependent Typology Code	0.306	0.308		
2004	Non-metro Recreation Typology Code	0.053	0.130	**	**
2004	Persistent Poverty Typology Code	0.417	0.308	**	**
2004	Population Loss Typology Code	0.214	0.178		
2004	Retirement Destination Typology Code	0.126	0.212	**	**
2004	Service-dependent County Typology Code	0.039	0.068		
Public Assistance					
2000	Proportion of adults age 65+ who have disabilities	0.523	0.501	*	*
2000	Proportion of total females age 65+ living in female-headed non-family households, living alone	0.383	0.374	***	***
2000	Proportion of families with female, no husband present with income below poverty level	0.405	0.374	*	*
2000	Proportion of families with female, no husband present with income below poverty level and with Social Security and/or public assistance income	0.137	0.117	*	*

Year of variable construction	Variable description	Mean for disconnected youth (DY) hotspot counties, 2007 ($N = 206$)	Mean for unemployed youth (UY) hotspot counties, 2007 ($N = 146$)	t-test for comparison of means, pooled sample significance	t-test for comparison of means, independent sample significance
2008	Total value of Women, Infants and Children program food benefits in a county per 1,000 population (2008)	0.303	0.244	**	**
Crime and Arrest Data (FBI Uniform Crime Reporting)					
2005	Part 1: Property crimes; sum of variables BURGLRY through ARSON	283.9	212.9		
2005	Part 1: Total; total number of Part I (index) crimes. This is the sum of variables MURDER through ARSON	387.4	293.8		
2005	Part 1: Violent crimes; sum of variables MURDER through AGASSLT	83	81		
2005	Rapes	3.79	3.67		
2005	Robberies	13.4	15.4		
2005	Runaways, juveniles only	24.3	9.3		***
2005	Sex offenses, not including forcible rape and prostitution	16.5	9.2		
2005	Have stolen property: buying, receiving, possessing	17.6	15.6		
2005	Suspicion	0.828	0.65		
2005	Synthetic narcotics-Possession 118G; synthetic narcotics possession: manufactured narcotics that can cause true drug addiction (Demerol, methadone)	26.5	12.4		
2005	Synthetic-Drug sale/manufacture 118C; Synthetic narcotics: manufactured narcotics that can cause true drug addiction (Demerol, methadone)	8.77	2.77	*	*
2005	Vagrancy	12.36	1.71		
2005	Vandalism	34	33		
2005	Weapons violations; carrying, possessing, etc.	28	19		

Note: Spatial clusters identified using local indicators of spatial association (LISA) tests. DY (UY) hotspot counties are defined as counties central to spatial clusters with statistically significantly higher rates of DY (UY) than expected by chance. All overlapping DY and UY clusters were removed, and counties that are between adjacent clusters are removed so that there is no overlap or first-order contiguity in these two groups of clusters

* = significant at 1 % in a two-tailed test

** = significant at 5 % in a two-tailed test

*** = significant at 10 % in a two-tailed test

For the first group of variables under the heading "Residential Segregation, Social Capital, Racial/Ethnic Distribution," the residential isolation index for Hispanics is significantly higher in the DY hotspots than in the UY hotspots, as is the proportion of the population who are Hispanic. The proportion of population that is African American is significantly lower in the DY than in the UY hotspots, and the composite index of social capital is significantly lower. In the next category, "Poverty, Income, Educational Attainment, Unemployment, Uninsured Status," poverty rate among children is present in a significantly greater proportion of DY than UY hotspot counties (69 % versus 50 %), median household income is lower, educational attainment is less, the unemployment rate is lower, and the percent of population uninsured is higher. The finding that the unemployment rate is lower is consistent with how unemployment is defined in this study, based on the official BLS definition. Examining percent poor rural population by race or ethnicity, DY hotspot counties have higher percentages of poor rural Hispanics and whites, but lower proportions of poor rural blacks, than UY hotspot counties.

In the next category, which reflects social cohesion "Travel to Work, Migration, Urbanicity, Foreign Immigration, Language Ability," DY hotspots have higher proportions of employed people traveling more than 60 min each way to work than UY hotspots counties, and higher proportions of adults who speak little or no English, live in linguistically isolated households, are foreign immigrants, or are recent foreign immigrants. In the next category "Economic Dependence Typology Codes," the DY hotspot counties have a significantly lower dependence on manufacturing, and a higher dependence on mining, than the UY county hotspots. In the category "Public Assistance," the DY hotspots have higher proportions of elderly with disabilities, impoverished female headed households with no husband present, and same receiving social security or public assistance income, than UY hotspot counties. In the last category "Crime and Arrest Data," DY hotspots have significantly higher average numbers of arrests for synthetic drug manufacture of addictive substances than UY hotspot counties.

Discussion

Despite considerable policy attention devoted to disconnected youth, disconnected youth remain an understudied phenomenon in the US, leaving several fundamental issues unresolved in regard to disconnected youth in the US. Perhaps most fundamental is determining the locations of highest incidence of disconnected youth. Many policy reports focus on the disconnected youth problem in specific geographic areas (e.g., Lewis and Burd-Sharps 2013), yet little research using appropriate geospatial methods has documented the spatial clustering of disconnected youth. Our findings clearly indicate that the disconnected youth problem is geographically clustered in certain regions. Appalachia, the Deep South, and the Southwest have statistically significant concentrations of disconnected youth, but these are not prevalent in all counties of these areas. In contrast, the Northeast and Midwest do not have many significant concentrations.

Another key issue addressed by this research is whether places with higher concentrations of disconnected youth are distinct from places with higher concentrations of unemployed youth. The results clearly show that disconnected youth and unemployed youth are concentrated in different geographic areas. We found some overlap in the Deep South, but in Appalachia and particularly in the Western US disconnected youth clusters are clearly distinct from unemployed youth clusters.

Although the time frame of our data prevents a formal analysis of temporal stability, the disconnected youth clusters in Fig. 1 appeared more stable temporally than were the unemployed youth clusters Fig. 2. Saks and Wozniak (2011) found that internal migration of younger labor-force participants was strongly pro-cyclical. Because disconnected youth are not in the labor force while unemployed youth are, this finding would suggest that unemployed youth hotspots might be less temporally stable than disconnected youth hotspots. For both DY and UY clusters in our data, however, the counties where high-rate clusters occurred were quite persistent over time: 84 % of the hotspots identified in one period were also identified in the second period. This is not surprising given that 'periods' were 5-years aggregates in a moving average that only shifted over 1 year on the time scale. Perhaps what is surprising is that in the span of only 1 year, 16 % of counties changed status.

Finally, we found that high concentrations of disconnected youth are correlated with substantial socio-ecological problems. We found that counties with high rates of disconnected youth have more arrests for manufactured drug sales and more juvenile runaways. These counties also have higher rates of uninsured children. In addition, we found that counties with high concentrations of disconnected youth are more likely to suffer from long-term economic decline. The results are correlational so the causal direction cannot be inferred, but clearly county governments dealing with a large population of disconnected youth must also deal with a host of other social problems, further stretching already thin budgets for social programs.

Limitations

Any survey-based data source will probably have limitations when conducting research on disconnected youth. In particular, a concern was raised about the American Community Survey in a recent economic study where a single 2009 estimate of disconnected youth from this survey was found to be significantly lower than other estimates of disconnected youth from smaller surveys such as the Current Population Survey and Add Health (Belfield et al. 2012: page 7). This 2009 American Community Survey estimate was found to be similar to one used by Montalvo and O'Hara (2008) based on a different year of the American Community Survey, 2006. Potential reasons for this inconsistency across the various survey samples are numerous (Population Studies Center 2012). Specific to the disconnected youth measure, it is more difficult to identify those who are disconnected youth in group quarters because the American Community Survey surveys people in group quarters separately. To address this concern, we abstracted disconnected youth from both group quarters and households and aggregated them by county to provide a complete count. In addition, the American Community Survey respondents are usually not the disconnected youth themselves, but in 85 % of cases are a related adult within the household. This source of error is something that we cannot address, is random across households, and, thus, not a source of statistical bias.

As noted, the results are correlational and cannot be used to infer causal directions. Clearly it would be beneficial to test causal hypotheses that might explain the geospatial patterns documented here. Given the complex nature of the disconnected youth issue, such hypotheses would need to consider numerous social factors and determinants of socioeconomic status. Our intent is that these results will spur social scientists across a range of disciplines to undertake

disconnected youth research and will promote the collection of data sufficient to test causal hypotheses.

Conclusion

Disconnected youth are a significant problem in the US and are gaining increasing attention from policymakers, yet some of the most basic questions regarding disconnected youth have gone unanswered because attention from US social scientists has lagged behind policy efforts. This article has, for the first time, used appropriate geospatial statistical approaches to document where disconnected youth are concentrated in the US. Furthermore, we have shown that disconnected youth are distinct from unemployed youth and spatially correlated with numerous socio-ecological problems. Although more work is needed to develop and test causal models relating disconnected youth to these problems, these results have provided a foundation for better documenting and understanding of the disconnected youth problem in the US.

Acknowledgments

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