Heterodox Microeconomics: A Spatial Turn for Environmental Health and Just Food System Social Provisioning

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Abstract

This paper examines food system social provisioning at low levels of geographic scale to merge the heterodox microeconomic approach outlined by Frederic Lee (2018) and the activist spatial justice methodology of Edward Soja (2010). Combining these two theoretical frameworks blends academia and activism by joining community perspectives with spatial, quantitative and qualitative data techniques to hypothesis test and investigate disparities in social provisioning. Initiating the inquiry with data available at the address level of geography allows the analysis to develop across diverse geographic scales and reveal consistent patterns of inequality. It is argued that these consistencies afford researchers, activists, and practitioners benchmarks for the study and development of transdisciplinary intervention design and implementation. This spatial study of pediatric food allergy frames a practical example of how this approach is applicable across a variety of socioeconomic and environmental health disparities and the pursuit of spatial justice outcomes at local and national levels of social provisioning.

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1. Introduction

This paper investigates food system social provisioning at multiple geographic scales to merge the heterodox microeconomic approach outlined by Frederic Lee (2018) and the activist spatial justice method advanced by Edward Soja (2010). Combining these two theoretical frameworks blends academia and activism by joining community level voices, spatial, quantitative, and qualitative data, and hypothesis testing to systematically address disparities in health and wellbeing across different populations. Triangulation of these data in the ArcGIS software package produces high-resolution spatial datasets that yield clusters and other spatial patterns for interpretation. Using data available at the address level of geography reveals consistent disparities in the social provisioning process at multiple geographic scales. Reflective analysis between levels of spatial aggregations afford researchers, activists, and practitioners benchmarks for the study and development of transdisciplinary analysis of intervention design and implementation. Specifically, this study of pediatric food allergy provides a practical example of how this approach is applied across a variety of socioeconomic and environmental health disparities.

The reflexive nature of this inquiry, however, begins at an abstract level with a description of the ontological and epistemological foundations of heterodox economics and Soja's spatial urban sociology. Lee's study of the economy as a whole using grounded theory critical realism (GTCR) complements Soja's theory of spatiality and the praxis of spatial justice. Together, assertive spatial heterodox economics is a systematic methodology for understanding social provisioning through a variety of data formats, types, and levels of aggregation. Consequently, this method of data triangulation informs narrative development. The next section defines and discusses the intersections of these two schools of thought and how the creation of spatial datasets is applied as a grounding principle from which further disciplinary and practical application of these abstract frameworks are animated.

To apply this theoretical grounding, the third section executes a targeted spatial analysis

of the food system from the household level of geography. Identified increases in the prevalence of food allergies by allergy specialists is a point of entry for understanding food system dynamics and its relation to public health from the social provisioning and spatial justice perspectives. Food allergy is selected based on recent evidence that suggests diet, nutrient deficiency, and increased consumption of highly processed foods are likely contributors to the increased diagnosis rates of this chronic disease (Ghosh-Dastidar et al., 2014). Given diet as a risk factor, food access is a concern. Therefore, the United States Department of Agriculture's (USDA) food access and health data are census tract level measures of the availability and proximity of healthy and nutritious foods. A spatial join of diagnosis and access data is completed in the ArcGIS software and analyzed using exploratory spatial data analysis (ESDA). Using this technique, further socioeconomic disparities are discussed and examined.

Section four interprets the observed spatial patterns and advances the inquiry by adding new economic and environmental data at larger geographic scales and diverse population aggregations. Visualization of the data displays consistent disparities in both the environmental and social dimensions of food system resource provisioning. Using Soja's triple dialectic and Lee's understanding of structures and causal mechanisms, a narrative of intervention is formulated. This narrative emphasizes the importance of making a "spatial turn" in social science broadly and heterodox economics specifically to develop robust place-based politics that integrate local, regional, and national levels of consciousness. An assertive spatial heterodox economics applied from national to household level geographies suggests controlled interventions at the community level enables changes in food system provisioning that creates jobs, raises healthy foods and food systems, builds resilient communities, and brings into view a vision for a just transition to a green and sustainable economy.

The final section concludes and expands the food system vision to the Green New Deal (H.R. Con. Res. 109, 2019). This section critiques orthodox policy approaches to hunger and poverty and argues that the universal jobs guarantee (JG) is consistent with the reflexive

ontological and epistemological grounding of assertive spatial heterodox economics. Implementing the JG around collective efforts for democratically organized value claims leverages the power of existing social networks and empowers place-based strategies for sustainable development. Combining the national vision for sustainability and local efforts to deliver healthier communities expands value creation beyond the narrow confines of price and profit.

2. Assertive Spatial Heterodox Economics

Edward Soja's spatial turn in urban sociology and Frederic Lee's heterodox paradigm shift in economics share complementary concepts at the ontological, epistemological, and axiological levels of inquiry. From these common meta-theoretical grounds, both intellectual projects are breaking away from constraints in their traditional disciplinary methodologies that limit understanding of social processes as well as our capacity through agency to reshape those processes. In each case, limitations to perspective are central to both critique and progress. As a social process, the food system is a focused and concrete space for displaying these limiting factors and illuminating transitional paths from theory to praxis.

Lee begins his call for a paradigm shift in economics at the ontological level. The orthodoxy's reliance on methodological individualism has created a vast body of work that describes, for example, utility maximization, equilibrium, production functions, market clearing, and self-adjusting markets. Unfortunately, these theoretical explanations have generated "concepts that have no grounding and hence no meaning in the real world" (Lee, 2018, p. 2). In contrast to modeling economic activity from the narrow perspectives of assumed rational agents and efficient firms,

> Heterodox economic theory specifically focuses on human agency in a cultural context and social processes in historical time affecting and directing resources and their usage, consumption patterns, production and reproduction, and the meaning (or ideology) of economic activities engaged in social provisioning utilizing empirically grounded

> concepts and a critical realist-grounded theory methodology. (Lee, 2018, p. 3)

In this case, the food system not only reveals consumption patterns but also the health outcomes related to those patterns, as the system is produced and reproduced.

Therefore, heterodox economics is not interested in studying the allocation of scarce resources among competing ends but is concerned with the social provisioning process. The social provisioning process is defined as an "emergent system of social-economic activities that generate surplus goods and services needed to sustain households and their social relationships, and thus society as a whole" (Lee, 2018, p. 1). As a surplus approach with Post Keynesian, Sraffian, Institutionalist, social, feminist, and of course, Marxian roots in political economy, the study of the social provisioning process corresponds with Soja's analysis of geographic struggle.

Rather than needing to break from methodological individualism, however, Soja's project seeks a greater understanding of the role of space in the production and reproduction of our daily lives. To develop this understanding, Soja advocates for an assertive spatial perspective and the application of the socio-spatial dialectic. From this perspective,

> social space is constituted neither by a collection of things or an aggregate of (sensory) data, nor by a void packed like a parcel with various contents, and that it is irreducible to a "form" imposed upon phenomena, upon things, upon physical materiality. (Lefebvre, 1991, p. 27)

In other words, space is not an external but an endogenous process. Spatiality does not deemphasize or ignore history but seeks to overcome the privileges of a historical mode of analysis that permeate social science, popular culture, and the public imagination. Therefore, Soja argues:

> as intrinsically spatial beings from birth, we are at all times engaged and enmeshed in shaping our socialized spatialities and simultaneously being shaped by them. In other words, we make our geographies just as it has been said that we make our histories, not under conditions of our own choosing but in the material and imagined worlds we

collectively have already created—or that have been created for us. (Soja, 2010, p. 18)

Given the reflexive nature of spatiality, one can see how Soja's socio-spatial dialectic complements and expands upon the focus of heterodox economics by contributing a spatial dimension to the holistic approach of studying the social provisioning process in which we are all embedded.

Additionally, if space is not simply the container in which history takes place, then "it is always filled with politics, ideology, and other forces shaping our lives and challenging us to engage in struggles over geography" (Soja, 2010, p. 19). Soja, like Lee, is interested in more than simply an academic exercise. Rather, both projects are concerned with "more progressive and participatory forms of democratic politics and social activism, and to provide new ideas about how to mobilize and maintain cohesive coalitions" (Soja, 2010, p. 6). It is this shared understanding of the role of praxis from which this shared axiological foundation is explored in the final section below. However, before proceeding with value theory, this section introduces assertive spatial heterodox economics (ASHE) with the food system as the subject of the inquiry.

While orthodox economists argue for the application of a universal agent for economic analysis of markets and allocation mechanisms, the dynamics of consumption, production, and distribution of food represents a significantly more realistic framework for examining social provisioning. As a primary input in the production and reproduction of daily life for individuals, as well as a system of production that connects human beings to the natural environment, the food system spans social, spatial, and ecological struggles for surplus. The Physiocrats, for example, recognized that "profits always come from the earth" (Marx, 1969, p. 51). As the original source of all value, agriculture and the food system in the modern epoch is generating struggles in the social provisioning process based on race, class, and the environmental capacity for soil to continue generating the necessary nutrients for system reproduction.

These struggles are not simply over surplus value and the inequality observed in financial distribution; the depletion of nutrients available in soils is affecting human health. To

develop this complex narrative of struggle, a geographic information system (GIS) is applied to bring the dynamics of Soja's socio-spatial dialectic and Lee's social provisioning process into a visible narrative. GIS technology is sufficiently flexible to examine qualitative and quantitative data across what Soja classifies as multiscalar geographies. Multiscalar geographies are constructed from both social and natural processes. As an example, administrative boundaries are socially constructed geographies that structure the social provisioning process at multiple levels of geography. The household parcel, neighborhoods, census tracts, ZIP codes, and national boundaries all shape spaces of social reproduction. In addition, these invisible social boundaries interact with the evolution of natural geographies, such as watersheds, wildlife habitats, and other sources of environmental services production.

Therefore, the examination of food's social provisioning using the multiscalar approach is a spatial application of Lee's CRGT and the socio-spatial dialectic. CRGT begins from the premise that there are causal mechanisms and structures that are guided and developed by acting individuals. Lee defines a structure as:

> different from a causal mechanism in that the former does not include agency; hence, it can only help shape or govern the actual event. Otherwise, it is similar to a causal mechanism in that it is real, observable, relatively enduring in form and organization, irreducible, and governed transfactually. The structures of an economy have two additional properties: (1) being sustained, reproduced, and slowly transformed by economic and social events that are caused by acting persons through their causal mechanisms; and (2) their form and organization have a historical character. (Lee, 2018, p. 11)

Consequently, the analysis of administrative boundaries at multiple geographic scales provides the capability of visualizing the distribution of social provisioning. The comparison of data patterns across both levels of geography and variables is an established procedure in ESDA (Johnston, 2005).

As patterns emerge from ESDA, tests for the robustness of the patterns are available to verify that the patterns represent spatial processes, rather than simply being random. These tests also address the Modifiable Areal Unit Problem (Briant, Combes, & Lafourcade, 2010; Openshaw, 1984; Wilson, Wilson, & Martin, 2019). How we draw our boxes for aggregation influences the distribution of that aggregation. Gerrymandering is a prominent example of this form of data manipulation (Soja, 2010). By using multiple shapes and boundaries, it is shown that the observed patterns in foods social provisioning are not simply the result of box selection, but are part of some other non-random spatial process (Briant et al., 2010; Wilson et al., 2019). Furthermore, bivariate tests exist for examining the relationships between variables.

Here, ESDA begins with an address-level investigation of food allergy prevalence in children. By identifying the spatial distribution of this chronic disease at the household level of geography, this analysis possesses the unique capability of being aggregated to a variety of scales, not only administrative but also generated by the analyst. The flexibility of geographic unit selection allows for a diverse set of risk factors for individual illness and the corresponding causal mechanisms exacerbating these health outcomes to be included in the inquiry.

One such risk factor is access to healthy and nutritious food. Food access is both spatial and socioeconomic. Both of these dimensions are included in the USDA food access data. Additionally, this spatial data is aggregated to the census tract level of geography. This facilitates the inclusion of other socioeconomic variables from national sources of data. In the next section, the food allergy and food access data are spatially analyzed to test the hypothesis that living in neighborhoods with limited access to healthy foods increases a child's likelihood of being diagnosed with a food allergy. From the household and individual level of food's social provisioning, a narrative is developed to understand food's spatiality and the interconnections between multiscalar geographies and the economy as a whole.

3. The Struggle for Food Access and Pediatric Chronic Disease

Health practitioners in several specializations including diet, nutrition, epidemiology,

and allergy, have noted an increased prevalence in food allergy diagnosis over the past several decades (Branum & Lukas, 2009). Understanding the structures and causal mechanisms contributing to this trend requires an interdisciplinary approach that includes individual dietary risk factors such as vitamin D levels, the timing of oral allergen introduction, and obesity (Liu et al., 2010). Additionally, it is increasingly clear that human health is related to complex environmental factors and differences in geographies, such as rural and urban settings (Jones, Hewson, & Kaminski, 2010). From the microbiome to our corner store, and out to global markets for corn and soybeans, the consumption, production, and distribution of food influences individual and social health outcomes.

To isolate specific structures and causal mechanisms behind the evolution of food allergy and to investigate food system social provisioning generally, a simple hypothesis is tested. Is food allergy associated with living within a food desert? The food desert concept is selected because it is one instance wherein the geographic location and dietary habits may intertwine. Support for this claim is found in studies that have shown residence in food deserts to be associated with other chronic, non-infectious inflammatory disorders, such as obesity (Ghosh-Dastidar et al., 2014). In addition, because food processing can alter the allergenicity of foods, it has been hypothesized that the ingestion of highly processed foods leads to increased sensitization to foods as well as other issues related to autoimmune disorders and microbiome health (Lepski & Brockmeyer, 2013; Zhang et al., 2015).

To connect diet and health to geography, the food desert is a clear indicator of failures in the food system's provisioning. The necessity of looking at the spatial distribution of this data is not only supported by individual health questions addressed above, but assists in understanding social disparities in access to not only food but income, education, and health services. Hence, the food desert is space that introduces a number of opportunities for investigating struggles over geography through assertive spatial heterodox economics.

3.1 The data

To assert the importance of geography, the description of data begins by discussing the *where* of this analysis. This study is a cross-sectional analysis of clinical data retrieved from the electronic health record of Children's Mercy, a freestanding, tertiary, pediatric care hospital and outpatient center located in downtown Kansas City, Missouri, with outreach clinics in multiple suburban sites[1]. Thus, the spatial analysis of the relationship between food deserts and food allergy is limited to the Kansas City Metropolitan Statistical Area (MSA). The Kansas City MSA spans both the states of Kansas and Missouri, 174 ZIP codes, 512 census tracts, and seven counties. The analysis was limited to this area to best represent our patient referral base. The geography is described in Figure 1.[i]

Pediatric outpatient clinic data was collected from visits dated January 1, 2004-January 1, 2014, from the hospital's electronic health records. Patients aged 0-18 years at the time of data collection were included in the study. The primary outcome variable was physician diagnosis of food allergy (ICD-9 codes 995.3, 995.60-995.69, 995.7, 693.1, 708, V15.01-V15.05, and V15.09). Covariate data collected included the date of visit, age, gender, home address at the time of visit, and insurance/payer. Because patients may return for subsequent visits, multiple encounters by the same patient were consolidated.

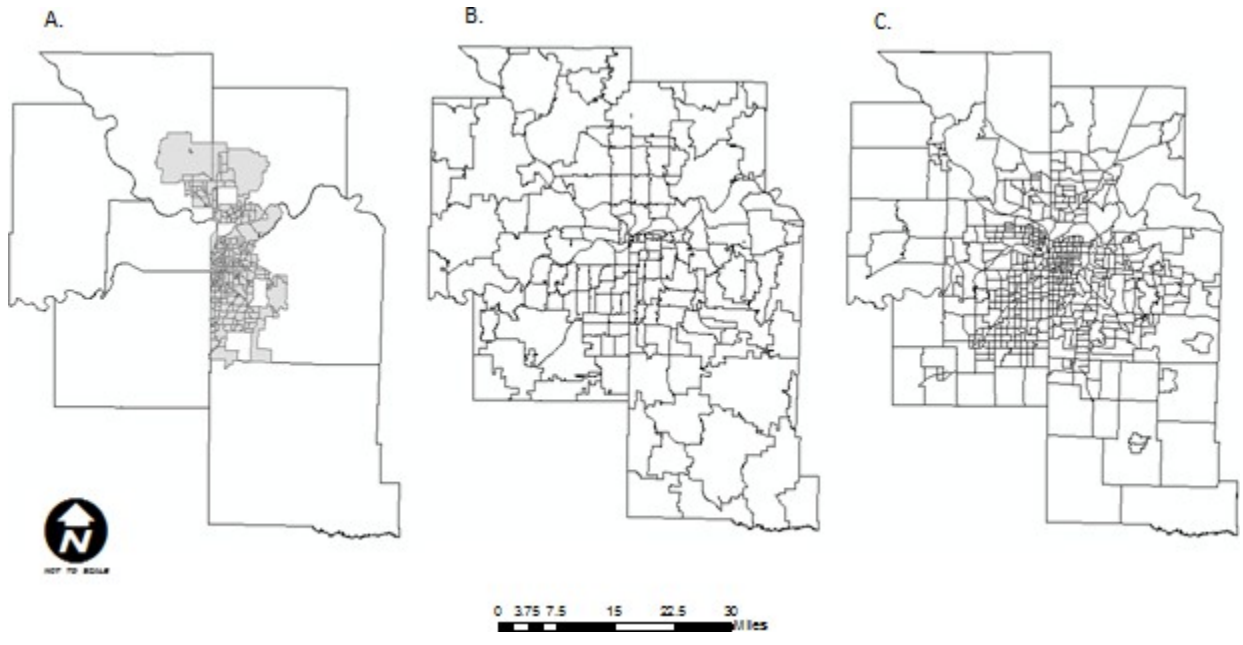

Figure 1. Geographic Units of the Kansas City Metro Area. In panel A, the seven counties outline the analysis area with the City of Kansas City, MO divided by its neighborhoods in gray. Panel B displays the ZIP code geography, and Panel C is the region's census tracts. Maps originally published in Wilson et al. 2019.

A total of 13,800 patient visits were collected, with 9,182 visits remaining after the removal of duplicate visits by the same patient. Of those patients, 9,010 were found to reside within Kansas and Missouri.

The home addresses of children with food allergies were mapped and located within the Kansas City MSA using Geographic Information System (GIS) software. A food desert map was then overlaid. The USDA defines a food desert as "a census tract with a substantial share of residents who live in low-income areas that have low levels of access to a grocery store or healthy, affordable food retail outlet" (Ver Ploeg et al, 2012, p. iv). To be categorized as "low access," a community must have a minimum of 500 persons and/or 33% of the census tract population living greater than one mile from a large grocery store in metropolitan areas and greater than 10 miles in non-metropolitan areas. "Low income" communities have a poverty rate of ≥20% or a median family income ≤80% of median family incomes in the surrounding areas (Ver Ploeg et al., 2012, p. iv).

3.2 Analysis

Overall, the patients' home residences spanned 513 ZIP codes. 174 ZIP codes were identified to be within the MSA of Kansas City with 7,386 food allergic children residing in those areas. After removal of inadequate addresses that were not able to be geocoded, a total of 9,010 were thus included in our final GIS analysis. The average number of food allergic children per food desert ZIP code (23.8+42.8) was significantly higher than that per non-food desert ZIP code (15.3+ 30.6; $p=0.02$).

Next, the analysis focused on the Kansas City MSA. In this space, representing our patient referral base, 7,386 patient records were geocoded. The average number of food allergic

children per desert ZIP code (66.4+58.4) was significantly higher than that per non-food desert ZIP code (36.0+43.8). Figure 2 displays the food allergic children and food deserts by ZIP code for the Kansas City MSA.

Visual inspection indicated a spatial relationship between food allergy diagnosis and residence within food deserts (Figure 2). Table 1 shows the results of spatial autocorrelation testing for food allergy outcomes and shows that despite multiple ways of defining geographical boundaries, the clustering demonstrated is non-random. In addition, the Local Moran's I also indicates that the clustering of census tract food deserts is also non-random .3815 (pseudo p-value .001)

Figure 3 displays the results of the Local Bivariate Moran's I test .2756 (pseudo p-value .001). The figure displays the spatial permutations of high and low counts of food allergy encounters and food deserts. The test indicates that the bivariate clustering pattern is non-random. This spatial analysis procedure indicates that there are 21 ZIP codes where high counts of both variables are clustered.

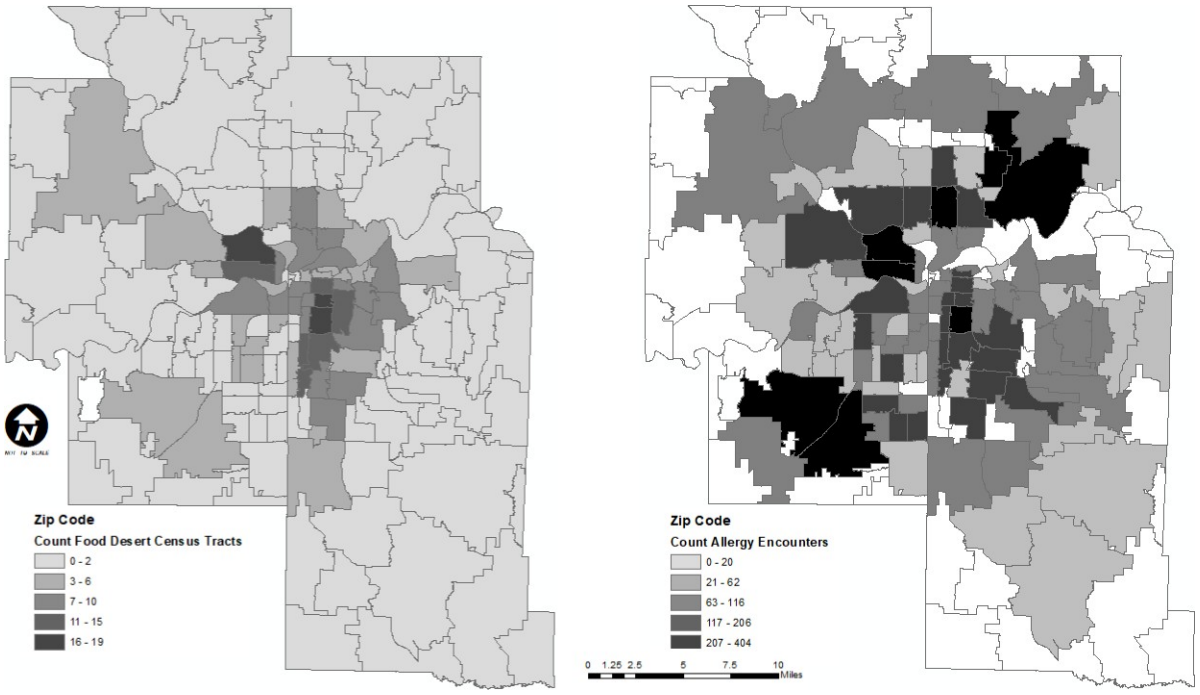

Figure 2. Food Allergy and Food Deserts Aggregated to ZIP Code Geography (USDA, 2013).

In this study, the prevalence of pediatric food allergy is found to be similar to previously published reports, which quote ranges from 3.4-8% for pediatric patients in other populations (Sicherer & Sampson, 2014; Taylor-Black & Wang, 2012). In addition, ZIP codes associated with food deserts have a significantly higher number of food allergic children than those not associated. Further, the data indicate that when utilizing address level geocoding techniques and ESDA, food allergy clusters are spatially associated with food deserts.

Table 1.

Testing for Cluster Patterns in Food Allergy		
Place	*Moran's I*	*pseudo p-value**
MSA Zip Code	0.26	0.001
MSA Census Tract	0.21	0.001
MSA Mile Grids	0.62	0.001
MSA Half Mile Grids	0.48	0.001
Kansas Side of MSA Zip Codes	0.17	0.016
Missouri Side of MSA Zip Codes	0.3	0.001
Kansas Side of MSA Census Tracts	0.1	0.011
Missouri Side of MSA Census Tracts	0.2	0.001
Kansas Side of MSA Mile Grid	0.63	0.001
Missouri Side of MSA Mile Grid	0.62	0.001
Kansas Side of MSA 1/2 Mile Grid	0.46	0.001
Missouri Side of MSA 1/2 Mile Grid	0.48	0.001
KCMO Neighborhoods	0.16	0.001
KCMO Half Mile Grid	0.48	0.001
KCMO Mile Grid	0.56	0.001

*Pseudo P-values developed from 999 permutations.

While this study cannot establish causality, the associations found suggest that a nutritionally poor diet, possibly related to ingestion of highly processed foods, may contribute to the pathogenesis of food allergy. Living within a food desert has been linked to obesity, a chronic, inflammatory condition linked to multiple disease states, including allergic disease and food allergy (Visness et al., 2009). Also correlated with poor diet are alterations in the gut microbiome (Zhang et al., 2015), which too has been linked to food allergy (Rivas et al., 2013).

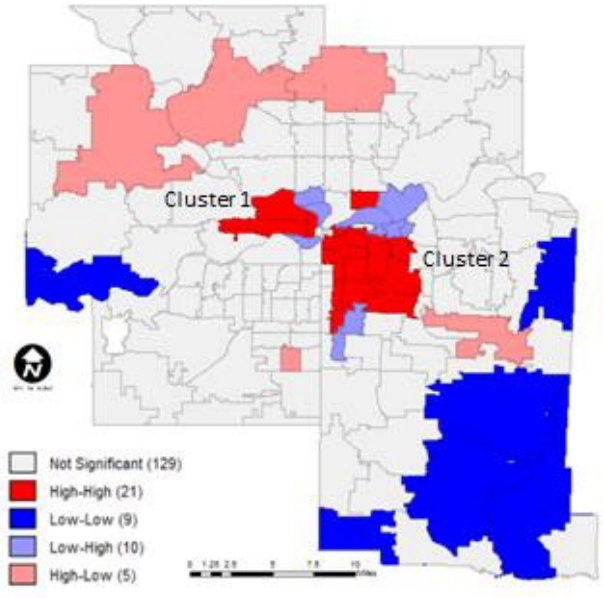

Figure 3. Bivariate Moran's I Test for Spatial Autocorrelation. Clusters 1 and 2 indicated non-random spatial clustering of Food Desert census tracts and counts of pediatric food allergy at the ZIP code level of geography.

Before proceeding, some potential limitations of the data should be addressed. First, the use of home addresses at the time of clinic visit may not be representative of the patient's long-term residence. However, as with all cross-sectional studies, the findings represent an association and not causation. The USDA food desert maps in our analysis were created in 2010; thus it is possible that food access within a given area may have been different prior to or following the time of mapping.

The other challenge is that food allergy and food desert relation is a narrowly focused

question. However, this narrow focus identifies a pattern, which invites further inquiry. Because the health diagnosis are mapped with precision, the investigation of confounding variables can be conducted at the levels of geography at which a wide variety of other variables are available. These variables can then be examined through ESDA at regional and national levels to explore possible structures and causal mechanisms that generate the spaces of inequality and disease observed in Kansas City. For this exercise, we turn to the next section.

4. Reshaping Food's Social Provisioning for Spatial Justice

The preceding analysis shows that food access and pediatric food allergies are spatially clustered in non-random patterns. These observable patterns emerge from triangulating health and socioeconomic data across the Kansas City MSA. Observation of these patterns indicate that rational choice is an insufficient model for understanding the prevalence of food allergy and other chronic noninflammatory conditions and associated diseases. Instead, food allergy clusters reveal the need to investigate structural inadequacies in food's social provisioning related to the patient's environment. Therefore, these findings afford practitioners the opportunity to explore alternative treatment strategies, such as upstream medicine (Barnes, Amado, & Portnoy, 2010; Manchanda, 2014), as well as preventive medicine (Wilson et al., 2019). Additionally, with this information the community becomes empowered to implement strategies to transform their environments and engage in democratic activities to alter the social provisioning process.

The observed health and socioeconomic patterns are captured by the administrative boundaries that organize the city. This affords the researcher two important advantages. First, it is argued that these boundaries function as structures that link social provisioning from the local to the global and from the past to the present. These links are described below using national patterns of human and environmental health, historic redlining boundaries, as well as neighborhood coalition building. Second, coalition building demonstrates how these

boundaries, as structures, are open to change through agency. What for example would a health or health intervention zone look like. Should developers of administrative boundaries consider how they overlap with biological boundaries, such as watersheds? These changes open new imaginative approaches to food and health and require value claims. Through the lens of health and food, these claims contribute to the development of collective and democratically driven theories of value that complement assertive spatial heterodox economics' ontological and epistemological grounding.

Micro level study of social provisioning processes align with current spatial examinations of inequality and environmental (in)justice[ii] that are global or national in scale. Significant patterns of dead zones and desertification (Figure 4) as well as national level patterns of poverty (Figure 5) identify the breadth of these injustices but are limited in terms of intervention and the design of solutions. In contrast, the micro-level identification of spatial (in)justice informs the investigation of causal mechanisms. Acting persons drive causal mechanisms, unlike the administrative boundaries. Thus, it is argued that the identification of causal mechanisms not only informs the emergence of patterns of (in)justice but also informs the development of organized forms of resistance and change.

Drilling down and developing high-resolution images of the social provisioning processes that produce and reproduce the lived environment opens the door to:

> speak of unjust geographies involving the human body, as in debates about abortion, obesity, stem cell research, the transplantation of body parts, sexual practices, or the external manipulation of individual behavior. At the other extreme, the physical geography of the planet is filled with spatially defined environmental injustices, some of which are now being aggravated by the uneven geographical impact of socially produced climate change and global warming. These two extremes, the corporeal body, and the physical planet, usefully define the outer limits of the concept of spatial (in)justice and the struggles over geography. (Soja, 2010, p. 31)

Frequently, it is at these outer limits and in the abstract that debate and analysis take place. By focusing, the analysis at smaller geographic relationships between the human body and our physical environments, tangible praxis and agency is afforded greater power to organize.

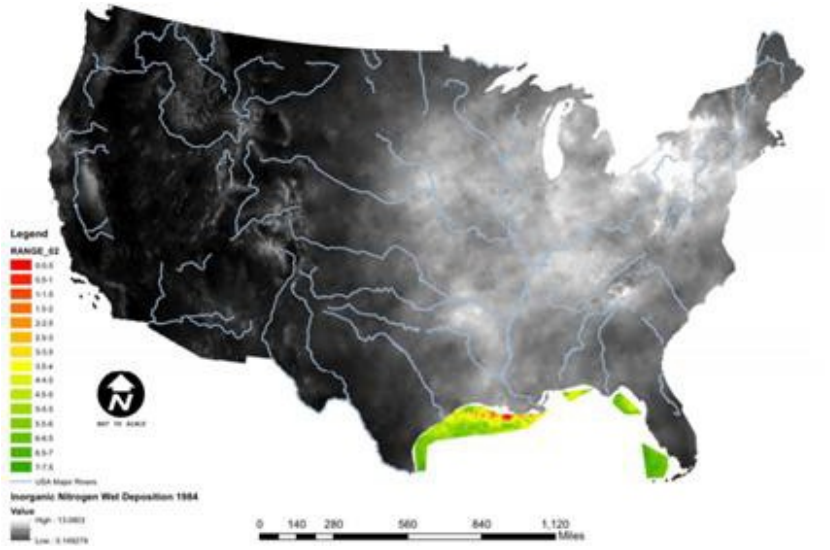

Figure 4. Inorganic Nitrogen Concentrations and Dead Zones. Data source: U.S. Geological Survey (2014). Map originally published in Wilson 2015.

From the national, state, county, and metropolitan levels of geographic scale, patterns of (in) justice remain consistently visible. Rather than starting from the position of tackling poverty or food access at a national perspective, place-based strategies for ameliorating these issues are suggested to build knowledge across diverse contexts and build regionally organized structures for change. Accordingly, by focusing this analysis through the vision of spatial justice outlined by Soja (2010) in Los Angeles, California, the importance of local movements for spatial justice is illuminated. One of the feature examples outlined in the narrative of change in L.A. is the Bus Riders Union (BRU). To address the spatial injustice of a poorly organized public transportation plan that emphasized the aesthetics of high speed trains and individual car ownership over the practical and essential precision of bus stops for moving the working class to employment, the BRU organized across demographic and industry lines. Much can be learned from this grassroots process of coalition building to ensure that social production is place and

justice focused.

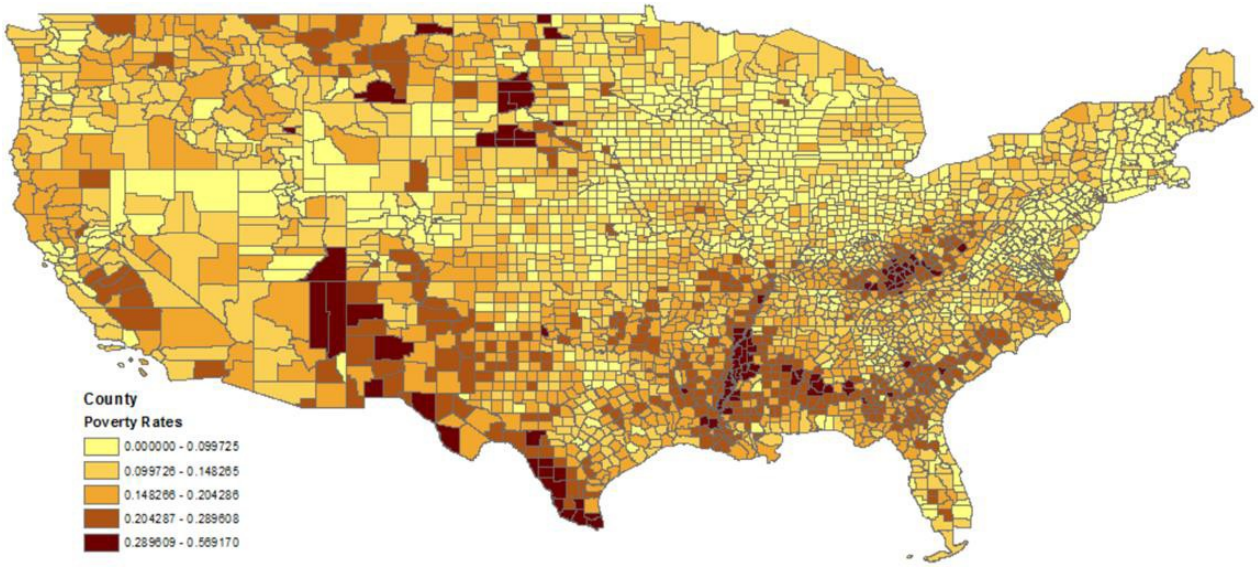

Figure 5. County Level Distributions of Poverty. Data sources: U.S Census Tiger/line shapefile (United States Census Bureau, 2017) and Opportunity Insights (2020), The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility, Neighborhood Characteristics by County.

Similar to the top-down transportation failure in Los Angeles, Kansas City's food system distributes access across the metro based on a legacy of segregation and disinvestment from the top down. As we observe the patterns of food access and chronic disease, historic redlines and demographics tell a story of racial division and inequality. Two clusters are identified in Figure 3, and each has their own unique story of development. Cluster 1 is Kansas City, KS (KCK), and cluster 2 is the Historic East Neighborhood Coalition. These sections of the city are very different. KCK is an immigrant rich section of the metro with strong Native and Latin American populations. Cluster 2 represents some of the oldest neighborhoods in the city and boast some of its most culturally relevant history, such as the Jazz District, the birthplace of Charlie Parker, and the Negro Leagues Baseball Museum where the famed KC Monarchs with legends such as Buck O'Neil, Satchel Paige, and Jackie Robinson once played.

Both spaces continue to struggle with legacies of racism and segregation. The links between to historic racial division and redlining and poverty (shown in Figure 6), also spatially coincide with the Historic East Neighborhood Coalition (HENC). HENC is particpates of several initiatives to address the food access struggles of their community. Additionally, these coalition is not isolated to their neighborhoods, but is spreading across the metro and into the rural farming communities beyond the metro. Their movement building mirrors the process that developed with the L.A. BRU. On the east side, urban agriculture is addressing these quality of life issues and is beginning to build resilient spaces of production and health. As can be seen in Figure 7, the growth of urban agriculture is concentrated in the spaces least able to access healthy foods from the market-driven food system.

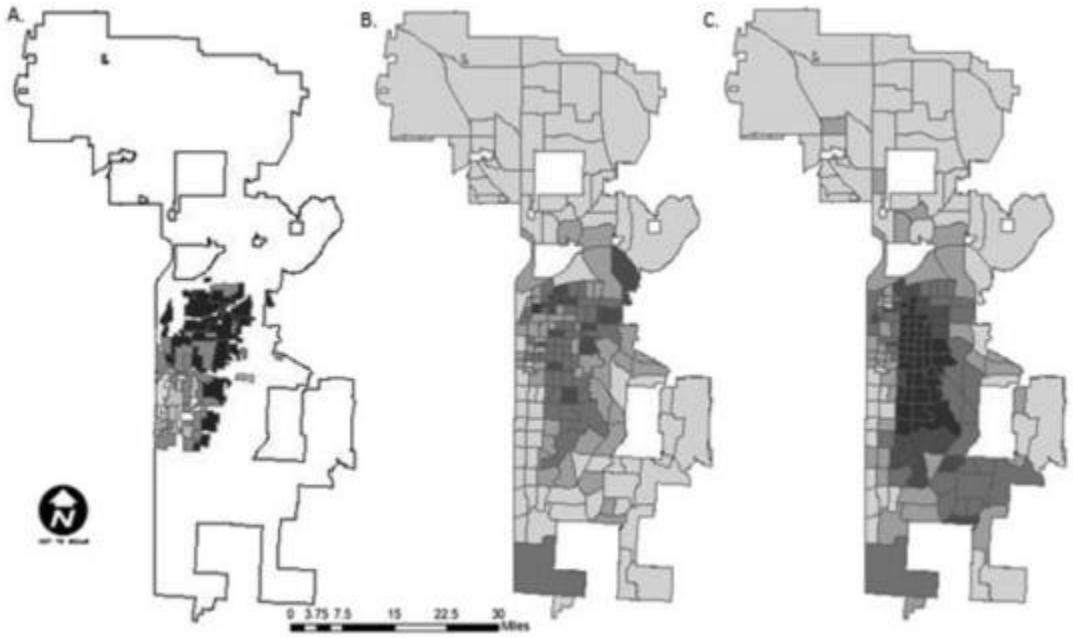

Figure 6. Redlining, Poverty and Racial Segregation. Panel A displays Historic Redlining Data to Display Grading on a Four-Point Scale: Best, Still Desirable, Definitely Declining, and Hazardous. These Ratings are Displayed Along the Grayscale From Lightest (Best) to Darkest (Hazardous). Hazardous Rating Was Characterized by Conditions Such as; "Negro Encroachment," "Percent Negro and Foreign," "Wage Earners," and "Low-Grade Foreigners." (B) Poverty Density from 2000 Census Divided by Natural Jenks Test into Four Quantiles.(C) Minority Population Density from 2000 Census Divided by Natural Jenks Test into quantiles. Maps originally published in Wilson et al. 2019.

The creative utilization of vacant lots is a community-driven response to the spaces they have inherited and must change to address their needs. French sociologist Henri Lefevbre described autogestion as a strategy whereby:

> A social group (generally the productive workers) refuses to accept passively its conditions of existence, of life, or of survival, each time such a group forces itself not only to understand but to master its own conditions of existence. (Lefebvre, 2009, p. 135)

The changing of their environment and local food production, is demonstrating Lefebvre's autogestion as a democratic declaration of valuing healthy foods, while also providing a space for assessing and studying the impact of upstream medicine (Manchanda, 2013). As these local production sites have grown and pop-up neighborhood markets such as Grown in Ivanhoe have experienced success in creating access, promoting democratic actions, and diversifying community ownership, while also engaging regional efforts to expand access to community-supported agriculture and other alternative food systems (Wilson, 2015). As can be seen, the concentration of these gardens is highest in the areas characterized as food desert clusters.

What this analysis is attempting to bring into view is that ASHE highlights similarities and differences across geographic and historical contexts. One of the key similarities across these contexts is the failure of causal mechanisms that reinforce the profit motive as its core value structure. In contrast, the pursuit of social and economic justice broadens value streams. Positive health, stronger and more resilient communities, and greater mobility and democracy with public transportation emphasize values beyond the bottom line. Hence, a space in which ASHE is critical is in the development of a revived value theory discussion in economics and social science in general. The spatial turn and the call for spatial justice is a value question. The fictional narrative of the invisible hand and the assumption that the aggregation of profit-driven activities leads to optimal allocations are key failings in the market ideology. While the critiques of ontology and epistemology are thorough and well documented, it is likely that the lack of a

coherent alternative theory of value is slowing the spatial turn from reaching Lee's prescribed paradigm shift.

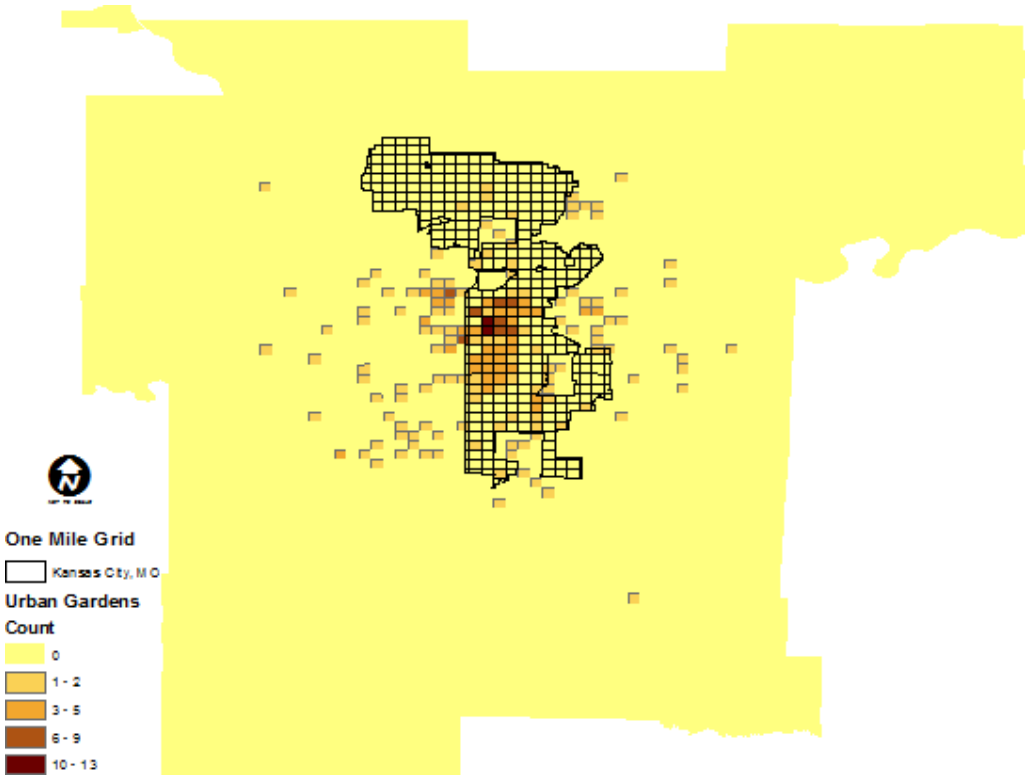

Figure 7. Urban Agriculture in Kansas City Data source: Kansas City Community Gardens. One-mile grid created to present alternative space of aggregation, boundaries for empty grid squares removed to present an alternative visual of the distribution.

An alternative to methodological individualism, competition, and the profit motive is the recognition of collective action. Just as Henri Lefebvre described autogestion as a collaborative action for positive social change, Robert Hockett (2019) describes the dangers and persistence of collective action problems, such as bubbles and climate change. Breaking away from the individualist narrative purported by orthodox economics allows for a vision of what can be achieved collectively. Climate change is a global problem that is bigger than simply the aggregation of individual optimization decisions. A collective problem requires collective action.

Unfortunately, the massiveness of the problem leaves many asking what they can do. For example, it does not feel like enough to recycle or to use reusable grocery bags, because individual decisions and consumer demand are not going to solve this problem. Similarly, inequality is a struggle that requires more than changes in individual behavior; it requires organized collective action.

Thus, the final section argues that strong links between the very general vision of the Green New Deal and the specific actions taken by the urban gardeners in Kansas City represent the reflexive relationship between processes of autogestion and large scale collective action problems to cultivate new value streams guided by production decisions, not consumption.

5. Policy, Vision and Value

In her examination of the Trump Administration's recent change to SNAP rules, Maggie Dickinson (2019) quotes Agriculture Secretary Sonny Perdue, who states in a corresponding press release, "We need everyone who can work, to work." While the sentiment of universal employment is a shared objective, the value system underlying the Secretary's comments are flawed by methodological individualism and the pervasive view that markets best solve social and environmental problems. This issue is also found in the largely progressive work of Raj Chetty and his Harvard team's Opportunity Insights efforts.

In both of these cases, the underlying issues of poverty and hunger are best solved through price interventions. For Secretary Perdue, the hungry dog will hunt narrative of Speamhamland (Polanyi, 2001) and more recently, the Reagan Administration's Welfare Queen (Brockell, 2019), justify the removal of food benefits to encourage "able-bodied recipients" to find work (USDA, 2019). The price of unemployment is too low, if the helping hand becomes "an indefinitely helping hand," argues Secretary Perdue. Similarly, Chetty and his team find that living in poverty affects several health and socioeconomic outcomes for individuals that can continue across generations (Chetty, Hendren, Kline, & Saez, 2014). Here again, it is a pricing

mechanism failure in housing that is identified as the problem, and the suggested and implemented policy is a housing voucher program (Opportunity Insights, 2020).

Treating these related issues—poverty, housing, and hunger—with pricing policies is a symptom treatment strategy, rather than a holistic approach to address the underlying cause of disease. As the spatial patterning suggests above, these challenges are not isolated to the individual, but are social and environmental. Dickinson (2019) points out in her study of SNAP benefits regulations that require employment affects networks of human beings associated with the individual benefit recipient. Children, elderly parents and relatives, friends and other community members often share and pool their food resources in order to protect the most vulnerable in their communities. For example, Dickinson (2019) describes:

> One father of four who had lost his job and was enrolled in SNAP used almost his entire $190 food-stamp budget each month to buy groceries for his children, even though they lived with their mother. He ate at several soup kitchens and went to food pantries so he would be able to buy more for his kids. As he put it to me when I interviewed him for my recently published book about SNAP, "I've basically been starving the past three days so my kids could have something to eat. A lot of times I eat a honey bun and some [chips] before bed and that's it. I'm starving now so they can have something later." (Dickinson 2019)

This level of hardship and hunger hardly appears to be an effective strategy for motivating this individual to get a job, or as is often the case, another job.

This type of network support system across families and neighborhoods relates to a significant finding in analysis of the Moving to Opportunity study (Chetty et al., 2016). In this analysis, the authors identify a "disturbance effect" which influences children of an age equal to or greater than 13 that do not experience nearly the level of benefits from moving from a high poverty neighborhood to a low poverty neighborhood in a voucher program. Here Chetty and his team recognize the importance of network effects and the familiarity of place, yet rather than

seek place-based solutions, argue that vouchers should be concentrated on families with younger children to maximize benefits.

While the policy proposal is lacking, the tools and data approaches of Chetty and Opportunity Insights are consistent with ASHE. Detailed measures of life expectancy, educational attainment, and intergenerational changes in income are all estimated and measured across multiple levels of geography. Combining these data with other health and environmental outcomes to create targeted and context-based solutions is likely a substantially more effective framework for policy development. Rather than dismantling existing social networks of support, policy should leverage this important social strength to encourage micro level forms of autogestion, such as diverse families coming together to meet their nutritional needs and larger efforts like urban and community-supported agriculture. These problem-solving efforts need to be recognized as social technology and as producing value.

At first glance, it might appear as though this type of value system is too abstract to be effective. However, the measures provided by Chetty's team above, reductions found in exacerbated asthma outcomes (Barnes et al., 2010), improvements to microbiome health (Rivas et al., 2013) increases to green space (Wolch, Bryne, & Newell, 2014), carbon footprint calculators e.g. carbonfoodprint.com, and a multitude of other measurables are already included in grant research and social enterprise performance plans and annual reports. This collective body of academia and activism yields benchmarks for expanding returns on social investment that extend far beyond the monetary bottom line. In other words, this work is already being done, but unlike the commodity and financial market infrastructure, proper institutional structures for the forms of investment are lacking.

Here the simplest and yet probably the most profound observation of Modern Monetary Theory (MMT) is crucial. Money is an IOU or a promise to pay (Bell, 2001). The father promises to support his children. The urban gardeners promise to raise healthy and nutritious foods for their neighbors. The bus riders promise to organize and use public transportation so that they

can all get to work and support their families. What is missing from these processes of autogestion is a larger framework that allows these efforts to survive, as the competitive forces of capitalism are often working against the ability of these individuals and groups to fulfill their promises. A strong contender for filling this void is the Green New Deal (GND) (H.R. Con. Res. 109, 2019). The GND affords the opportunity to address the collective action problems of climate change and inequality, but remains vague on the specifics on how these problems will be ameliorated.

Central to both the support of local efforts and macro outcomes is "guaranteeing a job with a family-sustaining wage, adequate family and medical leave, paid vacations, and retirement security to all people of the United States" (H.R. Res. 109, 2019). The bipartisan argument that "We need everyone who can work, to work" (USDA, 2019), must be activated not by the stick, but by the promise that anyone willing and able to work can do so to support their loved ones and the environment. This universal program is a moral imperative that provides a significant step away from the scapegoating, stereotyping, and ugly bigotry and racism that means testing for policy support foments in this country. All of us agree there is dignity in work (Perdue, 2019); however, rather than limiting the arm of the American helping hand, the food system is a point of entry for revolutionizing the concept of work, the provisioning of public health, and the ability to fulfill the American Dream.

As such, an Assertive Spatial Heterodox Economics provides the meta-theoretical grounding to develop enhanced knowledge and technology that is grounded by value systems that reflect democratic action from the household to the House of Representatives. Space and place matter. Therefore, our community and environmental health require an assertive spatial perspective.

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[i] This study was approved by our local Institutional Review Board with a waiver of informed consent.

[ii] Soja (2010) combines justice and injustice into one word.