Do Neighborhood Characteristics Help Explain Variation in Individual Wellbeing for People with Disabilities?

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****NOTE: Maps represented in Figures 1 through 8 have not been included here because of the size limitations associated with the electronic PAA submission process. They are available as a separate appendix by e-mail (Julia_Drew@brown.edu).**

ABSTRACT

An estimated 50 million Americans have disabilities, 30 million between the ages of 18 and 64.The adoption of the International Classification of Function, Disability and Health in 2001 by the WHO symbolized a broad consensus that disability is the result of the interaction between individual health conditions and contextual factors. This study asks whether economic and social wellbeing among those who have already developed disabling conditions differs across space. To answer this question, this study uses regression modeling and exploratory spatial data analysis to explore the effects of neighborhoods on the employment, earned and unearned income, and psychosocial wellbeing of working-aged people with disabilities. Contrary to expectations, this study finds that traditionally important neighborhood characteristics are not good predictors of wellbeing in this population. Findings suggest that future work should address whether results are replicable with nationally representative data, consider alternative geographical scales of analysis, and consider other neighborhood characteristics.

INTRODUCTION

Recent estimates place the number of people with functional limitations (the most common measure of disability) living in the U.S. at approximately 50 million people, with 30 million of those between the ages of 18 and 64 (Freedman, Martin, and Schoeni 2004). This translates into nearly 20% of the U.S. population, yet we know very little about what ecological factors affect the wellbeing of working-aged persons with disabilities. The adoption of the International Classification of Function, Disability and Health (ICF) in 2001 by the World Health Organization (WHO) symbolized the achievement of a broad consensus that disability arises as a result of the interaction between health conditions on the one hand and contextual factors on the other (WHO 2001). In 2006, the UN declared a convention on the rights of people with disabilities, emphasizing the need to redress "the profound social disadvantage of persons with disabilities and promote their participation in the civil, political, economic, social and cultural spheres with equal opportunities" (UN N.D.). Thus, identifying what ecological characteristics are important for understanding the wellbeing of people with disabilities and how they matter are especially relevant fields of inquiry.

The rapidly growing literature on the geography of disability suggests that communities – and cities in particular – comprise multiple spaces that are "barriered and bounded spaces, or spaces of exclusion" (Imrie 2001: 232). These exclusionary spaces are created through barriers which may be physical in nature, as with buildings lacking ramps or inaccessible public transit. They can also result from discriminatory or even well-intentioned but repressive attitudes and practices (Young 1990), as in the victimization of people with facial disfigurement (Hawkesworth 2001) or laws enforcing the placement of individuals with disabilities into residential institutions (Goffman 1961). The ability of individuals with disabilities to remain

living and working in the community may be a function of such factors as public commitment to the inclusion of people with disabilities, the availability of barrier-free housing, accessible education, tolerant neighbors, and willing employers.

This paper uses the literature existing at the intersection of two relevant bodies of work: scholarship on the geography of disability and work on the effect of neighborhoods on adult wellbeing. Scholarship on the geography of disability lays out the argument for why communities matter for the inclusion of people with disabilities, and the literature on neighborhoods and wellbeing suggests how best to measure community characteristics and analyze the relationship between these characteristics and the wellbeing of people with disabilities. This study uses a unique dataset to explore the effects of neighborhoods on the individual wellbeing of working-aged people with disabilities. Using a combination of regression modeling and exploratory spatial data analysis, this paper will investigate whether neighborhood characteristics seem to matter in explaining variation in the inclusion and wellbeing of people with disabilities. Finally, this paper uses both the literatures of communities and health and the geography of disability to interpret and contextualize findings.

COMMUNITY CONTEXT AND THE WELLBEING OF PEOPLE WITH DISABILITIES

A substantial share of recent work in the geography of disability literature focuses on how space shapes the wellbeing of people who have already developed potentially disabling conditions. Many scholars working in this tradition focus on individuals with a specific disabling condition, such as acne (Hawkesworth 2001), multiple sclerosis (Dyck 1999), or blindness (Golledge 1993) or on mobility impairments (Gleeson 1999) and mental health (Parr 1999) more generally. Others have taken a broader view and search for cross-cutting themes in the geography of people

with a diverse set of disabling conditions (Parr and Butler 1999). This more recently emerging work also tends to be quite interpretive in approach, generally eschewing quantitative models for more historical or phenomenological understandings (Park, Radford and Vickers 1998).

One of the primary concerns of this literature is how the social organization of particular places serves to exclude people with disabilities, most often from social or economic arenas. The built environment is frequently conceptualized as the main mechanism acting to exclude people with disabilities from particular spaces. However, the ways in which the built environment is envisioned with regard to disability and exclusion are diverse. Some focus on the "thoughtless" design of the built environment, which Gleeson describes as representative of the earliest work on disability and the city, and which tends to represent the built environment as the full extent of the societal role in disablement. Thus, the "discriminatory design of capitalist cities appears then to be an environmental 'accident' that the state must correct through accessibility legislation, rather than the observable form of deeper material and ideological structures of discrimination" (Gleeson 1999: 105). In contrast, others view the built environment as one prominent manifestation of social, political and economic practices or relations that serve to exclude certain groups of people from particular spaces (Imrie 1996; Gleeson 1999).

Still others focus less on the experience of traveling through and negotiating "disabling space," and more on how individuals manage space in a more proximate sense within the course of social interactions to exclude or avoid being excluded. For example, Dyck (1999) focuses her attention on women diagnosed with multiple sclerosis (MS) as they manage space in the workplace in order to conceal their impairments. Dyck notes her respondents exhibit a deep awareness that "performative capacities [are] at a premium, and often visible to others" in the workplace, and frequently adopt strategies that allow them to conceal or downplay their

symptoms (p. 125-26). She observed that respondents working in occupations with less control over where their work takes place were more likely to lose their jobs or experience other negative work-related reactions after the onset or exacerbation of MS symptoms than women with more control over when and where they saw coworkers and clients. Similarly, Hawkesworth (2001) found that the extent to which her respondents' self-described facial disfigurements mattered was also situational. Many of her respondents adopted strategies to avoid groups of people or places they considered to be dangerous or hurtful. Some chose to work and relax in poorly lit places, others chose to withdraw from social relationships or quit working, limiting their activities only to those that could be done in the home and venturing outside only in the company of a trusted companion.

The body of work on the geography of disability sketches out several competing and potentially complementary perspectives on how communities matter for the welfare and inclusion of persons with disabilities. One view emphasizes that certain characteristics of communities, like proximity to amenities or accessibility of public transit, can be meaningfully compared across communities without regard to the history or experience of a particular place. This perspective employs a conceptualization of place that Gieryn (2000) refers to as *space* – place "detached from material form and cultural interpretation" and more appropriately characterized in terms of "distance, direction, size, shape, [or] volume" (p. 465). Another point of view stresses that some or any understandings of societal complicity in disablement must always be historically and geographically grounded in the particularities of a place and moment in time. A third perspective suggests that the geographic scale of community may be the wrong scale at which to analyze how context matters for individual wellbeing or the experience of

exclusion for people with disabilities; instead, it might be that the space of interpersonal interactions is the most appropriate for investigation.

DATA AND METHODS

Analytical Strategy

The current study asks whether the risk of doing more or less well among those who have already developed disabling conditions differs across space. The work on neighborhood effects on health and wellbeing located in sociology and social epidemiology demonstrates one possible approach to measuring the relationship between communities and the wellbeing of people with disabilities who live in them. This literature, primarily concerned with the distribution of poor health and wellbeing across space, focuses on the identification of those community characteristics which put residents at higher risk of doing poorly and, to a lesser extent, the mechanisms linking the welfare of community residents to the neighborhoods in which they live. Low community SES, social disorder, neighborhood structure, and the built environment have all been identified as salient community-level factors associated with poor individual wellbeing. Much of the work on neighborhoods and wellbeing also aims to untangle whether observed relationships occur because living in disadvantaged communities causes poor individual-level outcomes, or because individuals who are already doing poorly tend to live in more disadvantaged neighborhoods (Subramanian, Lochner, and Kawachi 2003; Duncan, Jones, and Moon 1998). Scholarship in this area untangles the contribution of individual-level and community-level characteristics through a variety of study designs, including individual-level regression models that treat neighborhood characteristics as a characteristic of individuals (adjusting the standard errors for clustering within neighborhoods) and multilevel model designs

that allow for the comparison of individuals within as well as across neighborhoods. To utilize such study designs, it is essential to have measures of individual wellbeing, important individual characteristics that are associated with wellbeing, and information on the neighborhoods in which they live.

The current study employs a unique dataset with information on various aspects of wellbeing of SSDI beneficiaries and SSI recipients living in the state of Wisconsin. These data provide state-wide coverage of Wisconsin, including urban and rural areas, providing an advantage over data collected only in urban areas (for example, Browning and Cagney 2002 or Ross 2000). I first use a set of individual-level covariates derived from previous literature to predict wellbeing along four different dimensions: self-rated health, psychosocial wellbeing, employment, and income. OLS regression models are used to predict psychosocial wellbeing and income, and logistic regression models are used to predict self-rated health (excellent, very good or good health vs. fair or poor health) and employment. Models include measures of demographic characteristics, living arrangements, and socioeconomic status that prior work has indicated are important predictors of individual wellbeing. Models also control for disability-related characteristics (including type of primary disabling condition, number of secondary conditions, and others) that can also plausibly be linked to wellbeing. In addition to being modeled as one dimension of wellbeing, psychosocial wellbeing is also considered as a proximate pathway by which neighborhood characteristics act on other dimensions of individual wellbeing (Marmot et al. 1998).

I then investigate whether neighborhood-level characteristics seem to matter over and above individual-level predictors of wellbeing in two ways. First, I examine whether measurable community characteristics frequently employed in the neighborhoods and health literature appear

to be significantly associated with individual wellbeing after individual characteristics have been controlled for. Here, neighborhood is measured by zip code. Although there are various shortcomings associated with using zip code (Kreiger et al. 2002), it remains a reasonable proxy for neighborhood. To measure characteristics at the neighborhood level, I draw on data from the 2000 Census aggregated by zip code and information on the availability of public transit at the community level provided by the Wisconsin Department of Transportation. Although the data set utilized here provides statewide coverage, there are not enough individuals in each neighborhood to satisfy the somewhat stringent data requirements for multilevel modeling. For that reason, I explore whether measurable community characteristics seem to explain any remaining variation, after controlling for individual-level predictors, by examining bivariate associations between community characteristics and the residuals[1] of the individual-level regression models. This will allow me to test whether neighborhood characteristics commonly identified as important by the neighborhoods and wellbeing literature seem to affect the wellbeing of individuals with disabilities. Second, I explore the possibility that the broader context in which neighborhoods are located might also matter for individual wellbeing by conducting an exploratory spatial data analysis (ESDA) of the average standardized residuals by zip code from individual-level regression models[2]. If the pattern of residuals exhibits spatial clustering, this would suggest that there is an omitted community-level variable or set of variables at a geographic scale larger than the neighborhood that should be considered in a next stage of analysis.

Data and Sample

[1] Although unstandardized residuals have the benefit of being in the scale of the dependent variable, I use standardized residuals here, which are easier to use in the context of logistic regression.

[2] ESDA using lattice data (as in the current study) requires observations in all polygons. Because these data have statewide, but not necessarily complete, coverage, median values of the residuals were imputed for polygons with no observations so that they would represent neither high nor low values in cluster maps.

This study employs a unique longitudinal data set with zip code information collected on a sample of Social Security Disability recipients and beneficiaries[3] between the ages of 18 and 64 participating in Wisconsin Pathways to Independence, a 5-year Social Security Administration-funded demonstration and evaluation project aimed at helping people with severe disabilities improve their employment prospects and/or return to work. The sample incorporates both individuals who received the intervention and a comparison group made up of similar individuals who did not receive the intervention. Program participants were enrolled on a rolling basis between July 1999 and October 2003 at seventeen provider agencies located throughout the state of Wisconsin. Though 956 individuals enrolled in the program over this period, only 556 were considered to have sufficient data to include in the de-identified data set used in these analyses. Comparison group members were enrolled over calendar years 2000 and 2001. It was generally the responsibility of participating agencies to find and recruit participants. Comparison group members, in contrast, were enrolled through a mailing sent to all members of a state-wide list of Social Security disability beneficiaries and recipients working with the state Division of Vocational Rehabilitation (DVR) who were either already working or were strongly considering working. Of the 3,816 people in Wisconsin who met these criteria, 643 (18%) were included in the comparison group. An additional 33 were lost to attrition or entered the participant group for a final total of 610 (Delin et al. 2004).

Data were collected from several different sources. Employment and income data were drawn from the Social Security Administration and Wisconsin state unemployment insurance systems for each calendar quarter from eight calendar quarters prior to program or comparison group entry, the calendar quarter of program entry, and eight calendar quarters after entry. Data

[3] Here, individuals receiving SSDI are referred to as “beneficiaries” whereas those receiving SSI are referred to as “recipients”.

on demographic characteristics, living arrangements, education, disability characteristics, self-reported health, and psychosocial wellbeing were collected via a self-administered survey collected at program (or comparison group) entry, as well as at one and two years after entry (Delin et al. 2004). To avoid the potentially confounding effect of the intervention, I limit my analysis sample only to the calendar quarter of enrollment, before the intervention ostensibly began. Respondents with missing data on demographic, socioeconomic or disability information were also omitted, bringing the sample from 1,166 to 1,064. Depending on the outcome modeled, additional cases missing on the outcome of interest were also omitted. Because of the reliance on administrative state data, there were no missing data on employment or income. However, there were 6 cases with missing data on measures of psychosocial wellbeing and 34 cases with missing data on self-rated health. Thus, the majority of analyses use 935 cases; those predicting self-rated health have 901.

Concepts and Measurement

Wellbeing. Wellbeing is a frequently used but ambiguous concept describing how individuals or entire groups are faring on a host of outcomes, including self-efficacy – referring to the psychosocial resources to achieve one's goals - (Boardman and Robert 2000), and physical and mental health (Ross 2000; Subramanian, Kawachi and Kennedy 2001). Here, it is used to describe *social inclusion*, a multidimensional concept useful to understanding how and to what extent entire groups of people, like people with disabilities, fully participate in social, economic and civic life, over and above concepts such as discrimination or inequality (Silver and Miller 2003). Inverting the concept of social exclusion, the concept of social inclusion incorporates multiple domains in which groups may be included or excluded. Domains particularly important for individuals with disabilities include those of "education, income and employment, the built

environment, leisure and ‘right to life’ issues” (Barnes and Mercer 2003: p. 42), as well as domains like self-efficacy, and good physical and mental health.

The current study explores whether four different dimensions of social inclusion vary by neighborhood context. Similar to studies in the neighborhoods and wellbeing literature, I examine whether neighborhood context affects self-rated health and psychosocial wellbeing for individuals with disabilities. I also consider whether neighborhood context affects the labor market inclusion (employment) of people with disabilities. However, because many definitions of disability (particularly many political and program definitions) define disability as the inability to work, it is also important to consider the effects of neighborhood characteristics on the economic wellbeing of individuals with disabilities; that is, the ability of individuals with disabilities to maintain a reasonable level of earned and unearned income.

Global measures of self-rated health have a confirmed association with a variety of health outcomes such as mortality, independent of other measures of health status (Idler and Benyamini 1997), and have been assessed as a key outcome of interest in a number of studies of neighborhoods and health (for example, Browning and Cagney 2002, 2003; Subramanian, Kawachi, and Kennedy 2001). Here it is measured with a single item, where respondents were asked “In general, would you say your health is: excellent, very good, good, fair, or poor?” Responses were then dichotomized into “excellent/very good/good” and “fair or poor” with the former as the reference category.

Psychosocial wellbeing has been measured in a variety of other studies as depression (Ross 2000) or self-efficacy/powerlessness (Boardman and Robert 2000; Downey and van Willigen 2005). Here I combine three measures representing different facets of psychosocial wellbeing: mastery, self-esteem and quality of life. Both mastery and self-esteem are considered

important coping resources (Pearlin and Schooler 1978). Mastery is akin to the concept of self-efficacy in that it is "the extent to which one regards one's life-chances as being under one's own control in contrast to being fatalistically ruled" (Pearlin and Schooler 1978: 5), and is considered a major component of how well individuals are able to cope with difficult situations in life. This study uses Pearlin and Schooler's (1978) seven-item scale of self-efficacy, which asks respondents how much they agree with statements such as "I have little control over the things that happen to me" and "I can do just about anything I set my mind to" (see table one). Self-esteem is measured using Rosenberg's (1965) widely-used 7-item scale, and quality of life is measured using three items from the International Association of Psychosocial Rehabilitation Services Quality of Life Scale (1995). Each of the 3 scales was combined individually before being combined into the larger measure of psychosocial wellbeing by taking the average of standardized values (with mean zero and variance 1), yielding a scale ranging from -2.89 to 1.49. Higher scores reflect better psychosocial wellbeing. The Cronbach's alpha measuring inter-item reliability was 0.74.

This study also examines the labor market inclusion and economic wellbeing of respondents. Respondents were considered to be employed if they had any earnings reported to the Wisconsin unemployment insurance system during the calendar quarter of program/comparison group entry. The total income figure is the sum of earned income, income from SSI, SSDI and from state supplemental SSI, and has been indexed in 1996 GDP dollars (Delin et al. 2004). Information on earned income was provided by the Wisconsin unemployment insurance system, and information on SSI, SSDI and state supplemental SSI benefit amounts was provided by the Social Security Administration.

Individual-Level Predictors of Wellbeing. All models include individual-level factors associated with wellbeing in prior studies, including age, race (non-Hispanic White/Other), sex, presence of children under 18, marital status, living arrangements (alone, with parents, with spouse, other), and educational attainment. Models also include disability-related characteristics, including type of primary disability (mental illness, physical or HIV/AIDS[4], or developmental), number of secondary disabling conditions, the age at which primary disability onset occurred, and the number of years since disability onset. The relationship between socioeconomic status and disability onset is complex; while poor socioeconomic conditions can increase the likelihood of experiencing disability onset relatively early in the life course, it is possible that disability onset also contributes to significant downward social mobility. Education has been considered to be a robust measure of socioeconomic status in studies of health and disability as it is usually completed prior to the onset of disability (for example, see Robert 1998). In the sample used for this paper, for example, the average age at disability onset is 26 years of age, an age at which most people have completed their education. Models predicting self-rated health and psychosocial wellbeing also control for employment status and total individual income from all sources. Models predicting self-rated health, employment, and income are shown with and without controls for psychosocial wellbeing. The majority of individual-level predictors were drawn from the survey administered at program enrollment. To minimize missing data, non-responses on the survey were compared to data from administrative sources and filled in with known values when possible. All models also control for sampling frame, with participant group membership as the referent category.

[4] To minimize the risk of identification, participants and comparison group members with HIV/AIDS were combined with those with other physically disabling conditions.

Community-Level Predictors of Wellbeing. Measures of community characteristics were drawn from two sources: the 2000 Census data aggregated by zip code (or ZCTA) and from a shapefile provided to the author by the Wisconsin Department of Transportation. Data from these two sources were matched to individual records. This study considers whether neighborhoods are served by public transit and the kinds of public transit available as potentially important features of the built environment. The availability of public transit in a given neighborhood may influence the ability of residents to participate in the labor market, particularly for individuals who may not be able to drive or to obtain a driver's license due to a disabling condition. Bus service may be the most important mode of public transportation to consider, although a measure of any public transportation available in the neighborhood is also evaluated.

This study also considers three overlapping conceptual features of neighborhoods – low neighborhood SES, social disorganization, and neighborhood structure – that have been identified as salient community-level factors associated with poor individual wellbeing. Neighborhood SES is generally defined by any or some combination of the following characteristics: income level, poverty level, home values, share of community residents with less than a high school education, unemployment, and percentage of households receiving public assistance (Robert 1999). In this study, I consider the individual effect of each of these neighborhood characteristics on individual wellbeing. Low neighborhood SES is strongly associated with concentrated deprivation and social disorder, both of which negatively affect the quality and availability of public services and amenities (Robert 1999), and expose residents on a daily basis to crime, noise, trash, vandalism and other chronic stressors (Ross 2000).

The concept of social disorganization includes low neighborhood SES, but also includes other community attributes that serve to reduce or weaken neighborhood social capital resources

(Browning and Cagney 2002). Neighborhood social capital is defined as features of the neighborhood structure which can facilitate informal social control and collective action, such as the presence of civic organizations, interpersonal trust, and strong norms of mutual aid and reciprocity (Lochner, Kawachi and Kennedy 1999; Ellen, Mijanovich and Dillman 2001). Social disorganization is measured in this study by poverty, residential instability (the percentage of residents living elsewhere 5 years ago), and ethnic heterogeneity (immigrant concentration) (Browning and Cagney 2002).

Neighborhood structure incorporates some elements of social disorganization, but also considers characteristics that are positively associated with individual wellbeing, such as the percentage of affluent residents (those households with incomes over some amount) living in the neighborhood (Robert 1998; Browning and Cagney 2003). For this study, I measure the share of affluent residents by the percentage of households with incomes greater than or equal to $50,000. Because of the specialized nature of the population considered here, I also incorporate the concentration of working-age people with disabilities (ages 16 to 64) and the percentage of elderly residents (those over age 65) as important elements of neighborhood structure.

RESULTS

Descriptive Results

Sample characteristics are presented in table two. Most sample characteristics differ significantly between the participant and comparison groups[5]. Over half of the sample has never been married, and 36% live alone. The sample is mostly non-Hispanic White (82%), and nearly half

[5] In general, comparison group members were slightly older, somewhat more likely to be female, more likely to be married, more likely to be non-Hispanic White, and substantially more likely to have a high school education or less. They were also more likely to report a physical disability or HIV/AIDS as their primary disabling condition, have slightly lower personal income, less likely to report being in excellent or good health, and more likely to report lower psychosocial wellbeing.

have completed more than a high school education. An approximately equal share of the sample has developmental, mental, and physical primary disabling conditions. Almost 40% of the sample was employed at program entry and the mean total income was a little over $2,300, or a little less than $800 per month. The mean psychosocial well-being score was -0.01 (on a scale from -2.89 to 1.49) and 63% of the sample reported being in excellent, very good, or good health. Most sample members (75%) live in a community where public transit is available. However, only 35% live in a neighborhood with bus service. On the whole, sample members live in communities that roughly mirror state characteristics for the total population as measured by the 2000 US Census[6].

Individual Wellbeing Regressed on Individual-Level Characteristics

Results from OLS regression models predicting psychosocial wellbeing and total quarterly income are presented in table three. Age, education, employment status and a handful of disability-related characteristics are significantly associated with psychosocial wellbeing. Older ages, having a mental disabling condition, and having a larger number of secondary disabling conditions are all negatively associated with psychosocial wellbeing. More education, being employed, experiencing disability onset longer ago and experiencing sudden disability onset are all associated with better psychosocial wellbeing. Psychosocial wellbeing is also the only outcome that remains significantly different for participant and comparison group members after controlling for other factors. Note that more than 80% of the variance in psychosocial wellbeing remains unexplained after controlling for individual-level factors. Age, being male, more than a high school education, employment, and sudden disability onset are all positively associated with

[6] Average household median income, percent of residents with less than a high school education, percent of households receiving public assistance, and percent of working-aged people with disabilities were nearly identical; however, the median housing values, percent unemployment, percent poverty, percent residential newcomers, percent foreign-born, and percent elderly were all lower for the general population. The percent of affluent households was higher in the general population.

total income. Years since disability onset and a primary mental disabling condition are both negatively associated with total income.

Whereas the observed relationship between these outcomes and demographic and socioeconomic characteristics is what we would expect based on previous literature, the observed relationships between outcomes and disability-related characteristics bear further explanation. Theories of coping around the occurrence of some stressor, like disability onset, would generally predict that the more time has passed, the more psychosocial wellbeing would return to "normal" levels. This may explain the positive relationship between years since disability onset and psychosocial wellbeing. The negative relationship between years since disability onset and total income, on the other hand, may be a function of how cash benefit amounts are calculated. Specifically, SSDI is calculated as a share of earned income, but inflation adjustment of social security disability cash benefits generally fails to keep pace with wage increases. Thus, those who experienced disability onset longer ago would experience a decline in real income that would outpace the increases to cash benefits calculated on the basis of earnings from 10 or more years ago.

Only a few individual characteristics are significant predictors of excellent or good self-rated health: being non-Hispanic White, being employed, and having more secondary disabling conditions. Non-Hispanic Whites are more than twice as likely to be in excellent or good health than others, and people who are employed are approximately 50% more likely to be in excellent or good health than unemployed people. After adding psychosocial wellbeing, the relationship between employment and self-rated health disappears, suggesting that improved psychosocial wellbeing is an important mechanism by which employment affects self-rated health. The disappearance of employment's significance also suggests that it is employment that affects self-

rated health rather than the other way around. Psychosocial wellbeing has a statistically significant relationship with self-rated health. Having the median psychosocial wellbeing score of 0.10, for example, translates into an 8% increase in the odds of being in excellent or good health. Other predictors stay relatively similar in magnitude, direction and significance after the addition of psychosocial wellbeing with the exception of having a mental health primary disabling condition. After controlling for psychosocial wellbeing, the magnitude of the mental health coefficient more than doubles and becomes statistically significant. Although this suggests the possibility of collinearity between psychosocial wellbeing and having a primary mental health disabling condition, running the model without mental health changes the psychosocial wellbeing coefficient little and it remains statistically significant (without mental health, the coefficient shrinks slightly to 0.69). It is not clear that the observed positive relationship between having a primary mental health disabling condition and self-rated health, relative to having a physical or HIV/AIDS primary disabling condition, means anything more than that people with physical disabling conditions are more likely to experience poor physical health.

Results from the logistic regression model predicting employment clearly demonstrate the individual-level covariates considered actually explain little of the variation in who is employed. This is somewhat surprising given that several of the coefficients included here are standard predictors of employment, such as sex, education, marital status and age. Only being a high school graduate and having a mental health rather than a physical disabling condition are significant predictors of employment. What is also interesting to note is that, although individuals with mental illness are twice as likely to be employed, they make an average of $200 less than individuals with physical disabilities. The implication is that income from cash benefits is a far more important source of income than earnings. Those who completed a high school

education were 60% more likely to be employed than those with less than a high school education. There was no significant difference between those with less than a high school education and those with more than a high school education in their probability of employment. Adding psychosocial wellbeing changes the magnitude of significant coefficients slightly, and exhibits an additional independent association with employment. A person with the median level of psychosocial wellbeing has a 3% higher chance of being employed compared to someone with a score of zero, and someone with a psychosocial wellbeing score at the 25th percentile (-0.53) has a 14% lower chance.

Bivariate Associations between Community Characteristics and Residuals

Standardized residuals from each of the regression models are displayed in descriptive maps by neighborhood in figures one through four. In all figures, the lightest gray represents neighborhoods where residents, on average, did somewhat less well than we would predict on the basis of the model. In the next shade darker are people who did slightly less well than we would predict, then in the darkest gray are people who did slightly better than we would predict, and in black are people who did somewhat better than we would predict. Neighborhoods in white represent communities where no sample members lived. For the most part, residuals fell in the range of normal variation, within two standard deviations of the mean. No clear spatial pattern in the standardized residuals emerges in any of the four descriptive maps.

This preliminary finding is confirmed by the correlation coefficients between neighborhood characteristics and residuals from the regression models (shown in table five)[7]. All correlation coefficients are quite small, ranging from -0.11 to 0.08, and only three are

[7] Darlington and Smulders (2001) outline several shortcomings of residual analysis. Thus, I performed a robustness check by incorporating each community characteristic into the individual-level models separately, adjusting the standard errors for clustering within neighborhoods (results not shown). Indeed, the only statistically significant association remaining is that between total income and percent elderly residents. For each percentage point more elderly residents in a neighborhood, individuals had $33 on average less in total quarterly income.

statistically significant. The percentage of residential newcomers is significantly and positively associated with self-rated health. This runs counter to the hypothesized relationship between the share of new residents and self-rated health, which predicts that larger proportions of new residents indicate greater social disorganization and thus, a negative relationship with self-rated health. Median home values, one measure of neighborhood socioeconomic status, are significantly and positively associated with residuals from the logistic regression model predicting employment. The percentage of elderly residents, on the other hand, is inversely associated with total income. Although these associations are statistically significant, the magnitude of the correlation coefficients is small, 0.08, 0.03 and -0.11, respectively.

Exploratory Spatial Data Analysis of Average Residuals by Neighborhood

Cluster maps from the exploratory spatial data analysis (ESDA) are shown in figures five through eight. Global Moran's I statistics from the ESDA are close to zero. Neighborhoods in white represent neighborhoods that demonstrated no regional clustering of high or low residual values. Dark gray represents neighborhoods with high residual values surrounded by neighborhoods that also have high residual values. Black represents neighborhoods with low residual values surrounded by neighborhoods with low residual values, and the paler gray categories represent communities with residual values that do not match those of nearby neighborhoods. The dotted neighborhoods have missing values. As with the results of community-level analyses discussed earlier, there appears to be no clear spatial patterning to the unexplained variance in individual wellbeing.

DISCUSSION

This study aimed to explore whether neighborhood characteristics explained variation in the wellbeing of individuals with disabilities above and beyond individual-level characteristics and

attempted to answer this question utilizing an analytical strategy derived from the literature on neighborhoods and health. A combination of regression modeling, visualization, and exploratory spatial data analysis was used to explore whether additional variation in individual wellbeing appeared to be explained by community characteristics after individual predictors of wellbeing had been controlled for among a sample of Social Security disability beneficiaries and recipients living in Wisconsin. Although several individual-level characteristics were significant predictors of wellbeing along each of four dimensions, analyses of measured and unmeasured community characteristics revealed no clear spatial relationship between individual wellbeing and neighborhood context.

It is possible that this is a "real" finding: ecological context is not important. However, given the weight of cumulative evidence in both the areas of neighborhoods and wellbeing and the geography of disability, it is more plausible that ecological context does matter, but that it matters in a way other than that which was measured in this study. It is more likely that the results of this study suggest one of two things. First, that this may be a measurement issue. It may be that zip code is not a good measure of "neighborhood." As Krieger and colleagues (2002) point out, zip codes are extremely heterogeneous, in terms of size and composition, and may not approximate the relatively small, generally homogeneous, and geographically bounded communities that we usually refer to by "neighborhood."

It is also feasible that zip codes are a reasonable proxy for neighborhoods, but that neighborhood is the wrong geographic scale at which to explore whether ecological context matters. Communities can represent geographically larger areas, defined through shared labor markets, policy environments, or other important ecological characteristics. Indeed, some work in geography of disability looks at entire cities, suggesting that a more appropriate unit of

analysis might be metropolitan areas. On the other hand, it may be that the neighborhood is too large. It may be more suitable to examine more intimate spaces within the neighborhood. For example, sites of social interaction like the home, the workplace, or the school might be more appropriate geographic scales of analysis to understand individual wellbeing for people with disabilities.

The results of this study suggest that several community-level factors identified as important predictors of individual health and wellbeing by scholarship in the neighborhoods and wellbeing literature are not good predictors of wellbeing among individuals with disabilities. This work also suggests several implications for future work. One is that future work should address whether these results are replicable with a different, perhaps nationally representative, data set. Another implication is that further exploration of different geographical scales of analysis is needed. A third implication is that other characteristics of neighborhood context, and perhaps other measures of individual wellbeing, should be considered.

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TABLES AND FIGURES

Table One. Measures Included in Psychosocial Wellbeing Score

Outcome	Question Wording
Mastery	1) I have little control over the things that happen to me. 2) There is really no way I can solve some of the problems I have. 3) There is little I can do to change many of the important things in my life. 4) I often feel helpless in dealing with the problems of life. 5) Sometimes I feel like I'm being pushed around in life. 6) What happens to me in the future mostly depends on me. 7) I can do just about anything I set my mind to.
Self-esteem	1) I take a positive attitude toward myself. 2) All in all, I am inclined to think I am a failure. 3) I feel I am a person of worth, at least on an equal basis with others. 4) I feel like I have many good qualities. 5) I am able to do things as well as most other people. 6) I feel confident about my abilities. 7) Overall, I am satisfied with myself.
Quality of Life	1) Overall, I have a good relationship with members of my family. 2) I am happy with my current living situation. 3) I have an active social life.

Table Two. Sample Characteristics

Individual-Level Characteristics	Mean (SD)
Age	39.03 (10.41)[a]
Male	0.54 (0.50)[a]
Divorced, Widowed or Separated	0.24 (0.43)
Never married	0.55 (0.50)[a]
Married	0.21 (0.41) [a]
Lives with spouse	0.22 (0.41) [a]
Lives with parents	0.18 (0.38)
Other living arrangement	0.24 (0.43)
Lives alone	0.36 (0.48)
Non-Hispanic White	0.82 (0.38) [a]
Has at least one child	0.18 (0.39)
Less than HS	0.17 (0.38)
HS graduate	0.37 (0.48) [a]
More than HS	0.46 (0.50) [a]
Employed	0.37 (0.48)
Total quarterly income	$2,318.38 (1378.90) [a]
Age at disability onset	26.35 (13.59)
Years since disability onset	10.37 (6.92) [a]
Primary Disability: Developmental	0.40 (0.49) [a]
Primary Disability: Mental health	0.32 (0.47) [a]
Primary Disability: Physical disability or HIV/AIDS	0.29 (0.45) [a]
Zero secondary disabilities	0.23 (0.42) [a]
One or Two secondary disabilities	0.39 (0.49) [a]
Three secondary disabilities	0.10 (0.30)
Four or more secondary disabilities	0.28 (0.45) [a]
Sudden disability onset	0.25 (0.44)
Gradual disability onset	0.32 (0.47)
Disability onset at birth	0.25 (0.44)
Comparison Group Sample Indicator	0.49 (0.50)
Psychosocial Wellbeing (Mean (SD)/ Median)	-0.01 (0.83) [a]/ 0.10
Excellent/Very Good/Good Self-Rated Health	0.63 (0.48) [a]
Neighborhood Characteristics	
Has public transit (any)	0.75 (0.43) [a]
Has bus service	0.35 (0.48)
Median household income level	$41,307.65 (11,245.15)[a]
Median home values	$106,030.30 ($35,457.29)[a]
Percent residents with less than high school education	0.16 (0.09) [a]
Neighborhood residents unemployed	0.06 (0.36)
Households receiving public assistance	0.02 (0.02)
Percent of residents in poverty	0.12 (0.10) [a]
Percent residential newcomers	0.47 (0.11)[a]
Percent foreign-born	0.05 (0.05)[a]
Percent of households with income >= $50,000	0.13 (0.04)[a]
Residents 16 to 64 with disabilities	0.16 (0.06)
Residents aged 65 and older	0.13 (0.04) [a]
N	935

[a.] Participant and Comparison Group means are significantly different at $p < 0.05$

*p<0.05; **p<0.01; ***p<0.001

Table Three. OLS Regression Results from Models Predicting Psychosocial Wellbeing and Total Quarterly Income

	Psychosocial Wellbeing	Total Income (Quarterly)	Total Income, Add Psychosocial Wellbeing
	b (S.E.)	b (S.E.)	b (S.E.)
Constant	0.33 (0.21)	961.64 (324.37)**	951.76 (320.20)**
Age	-0.01 (0.004)*	20.40 (5.99)**	19.28 (6.05)**
Male	0.03 (0.05)	335.29 (80.38)***	341.51 (80.59)***
Marital Status			
Divorced, Widowed or Sep.	-0.08 (0.12)	91.94 (184.68)	87.10 (183.91)
Never married	-0.002 (0.12)	99.65 (181.67)	92.90 (181.42)
Married (ref.)	0	0	0
Living Arrangements			
With spouse	-0.05 (0.11)	158.54 (182.36)	154.27 (178.70)
With parents	0.05 (0.08)	-126.62 (125.29)	-115.85 (119.98)
Other	0.12 (0.08)	27.36 (106.01)	9.81 (119.68)
Alone (ref.)	0	0	0
Non-Hispanic White	0.03 (0.07)	-14.72 (104.13)	-12.63 (104.44)
Has at least one child	-0.10 (0.07)	5.80 (113.30)	14.16 (116.08)
Education			
HS graduate	0.15 (0.07)*	136.05 (116.20)	136.17 (116.80)
More than HS	0.17 (0.07)*	420.26 (114.60)***	425.14 (115.10)***
Less than HS (ref.)	0	0	0
Employed	0.13 (0.06)*	1402.171 (80.55)***	1400.70 (81.06)***
Total income	0.01 (0.02)[a]	---	---
Age at disability onset	0.001 (0.003)	-2.13 (4.46)	-1.08 (4.51)
Years since disability onset	0.02 (0.005)**	-26.33 (7.13)***	-25.86 (7.20)***
Primary Disability			
Developmental	-0.03 (0.06)	-77.86 (97.18)	-59.19 (97.40)
Mental health	-0.35 (0.07)***	-231.05 (104.94)*	-207.85 (106.72)
Physical disability or HIV/AIDS (ref.)	0	0	0
Number of Secondary Disabilities			
One or Two	-0.13 (0.07)	-16.56 (102.50)	-9.24 (102.77)
Three	-0.24 (0.09)*	-36.78 (117.98)	-36.82 (146.85)
Four or more	-0.47 (0.08)***	-63.78 (118.00)	-57.53 (120.38)
Zero (ref.)	0	0	0
Nature of Disability Onset			
Suddenly	0.17 (0.07)*	321.16 (106.02)**	308.56 (106.45)**
Gradually	0.03 (0.06)	-17.38 (97.39)	-30.65 (97.77)
At birth (ref.)	0	0	0
Comparison Group Sample Indicator	-0.23 (0.05)***	-143.42 (81.70)	-123.34 (82.65)
Psychosocial Wellbeing	---	---	17.14 (51.52)
N	935	935	935
Adj. R^2/Pseudo-R^2	0.1841	0.2935	0.2938

[a]Multiplied by 1,000 for display purposes.
*p<0.05; **p<0.01; ***p<0.001

Table Four. Logistic Regression Results from Models Predicting Excellent, Very Good or Good Self-Rated Health and Employment

	Excellent/Very Good/ Good Self-rated Health	Self-Rated Health, Add Psychosocial Wellbeing	Employment	Employment, Add Psychosocial Wellbeing
	b (S.E.)	b (S.E.)	b (S.E.)	b (S.E.)
Constant	1.39 (0.66)*	1.39 (0.67)*	-0.61 (0.60)	-0.92 (0.59)
Age	-0.02 (0.01)	-0.02 (0.01)	-0.29 (0.15)	-0.004 (0.01)
Male	0.26 (0.16)	0.24 (0.17)	0.09 (0.35)	-0.29 (0.15)
Marital Status				
Divorced, Widowed or Sep.	-0.41 (0.35)	-0.42 (0.37)	0.09 (0.35)	0.15 (0.34)
Never married	-0.16 (0.35)	-0.24 (0.37)	0.54 (0.34)	0.56 (0.33)
Married (ref.)	0	0	0	0
Living Arrangements				
With spouse	-0.23 (0.35)	-0.33 (0.36)	0.19 (0.34)	0.35 (0.33)
With parents	0.35 (0.27)	0.24 (0.27)	-0.18 (0.23)	-0.08 (0.22)
Other	0.27 (0.21)	0.03 (0.25)	-0.19 (0.20)	0.07 (0.22)
Alone (ref.)	0	0	0	0
Non-Hispanic White	0.77 (0.21)***	0.81 (0.22)***	0.01 (0.19)	0.02 (0.19)
Has at least one child	-0.21 (0.22)	-0.11 (0.23)	-0.05 (0.21)	-0.11 (0.22)
Education				
HS graduate	0.16 (0.24)	0.08 (0.24)	0.48 (0.22)*	0.44 (0.22)*
More than HS	-0.02 (0.23)	-0.11 (0.24)	0.23 (0.21)	0.19 (0.22)
Less than HS (ref.)	0	0	0	0
Employed	0.38 (0.19)*	0.33 (0.20)	---	---
Total income	0.001 (0.10)[a]	0.0003 (0.10)[a]	---	---
Age at disability onset	-0.01 (0.01)	-0.01 (0.01)	-0.001 (0.01)	-0.001 (0.01)
Years since disability onset	0.02 (0.01)	0.02 (0.01)	-0.003 (0.01)	-0.01 (0.01)
Primary Disability				
Developmental	0.05 (0.20)	0.11 (0.21)	-0.15 (0.18)	-0.14 (0.18)
Mental health	0.19 (0.21)	0.46 (0.22)*	0.64 (0.19)**	0.73 (0.19)***
Physical disability or HIV/AIDS (ref.)	0	0	0	0
Number of Secondary Disabilities				
One or Two	-0.55 (0.22)*	-0.54 (0.23)*	-0.12 (0.19)	-0.08 (0.19)
Three	-0.41 (0.31)	-0.28 (0.31)	-0.06 (0.27)	0.03 (0.27)
Four or more	-1.43 (0.24)***	-1.16 (0.25)***	-0.31 (0.22)	-0.17 (0.22)
Zero (ref.)	0	0	0	0
Nature of Disability Onset				
Suddenly	0.08 (0.21)	-0.09 (0.22)	-0.10 (0.20)	-0.15 (0.20)
Gradually	-0.20 (0.19)	-0.28 (0.20)	-0.01 (0.18)	-0.02 (0.18)
At birth (ref.)	0	0	0	0
Comparison Group Sample Indicator	-0.32 (0.17)	-0.15 (0.17)	0.004 (0.15)	0.06 (0.15)
Psychosocial Wellbeing	---	0.74 (0.11)***	---	0.27 (0.10)**
N	901	901	935	935
Adj. R^2/Pseudo-R^2	0.1382	0.1776	0.0397	0.0455

[a]Multiplied by 1,000 for display purposes.
*p<0.05; **p<0.01; ***p<0.001

Table Five. Correlations between Standardized Residuals and Community Characteristics[a]

Community Characteristics	Psychosocial Wellbeing	Excellent/Good Self-Rated Health	Employment	Total Quarterly Income
Built Environment				
Bus system	0.05	0.03	0.02	-0.03
Any public transit	0.03	-0.003	-0.03	-0.01
Neighborhood SES				
Median household income level	-0.01	-0.02	0.05	0.04
Median home values	-0.02	-0.003	0.07*	0.03
Percent less than high school education	0.03	-0.01	-0.03	0.04
Percent unemployment	0.03	0.02	-0.06	0.03
Percent households receiving public assistance	0.04	-0.01	-0.03	0.06
Neighborhood Disorganization				
Percent in poverty	0.02	0.02	-0.04	0.03
Percent residential newcomers	0.02	0.08*	0.01	0.05
Percent foreign-born	-0.01	0.003	0.04	0.01
Neighborhood Structure				
Percent households w/incomes >$50,000	0.01	-0.02	0.05	0.01
Percent working age with disabilities	0.02	-0.01	-0.04	0.02
Percent elderly	-0.01	-0.02	-0.01	-0.11**
N	935	901	935	935

[a]Pearson's correlation coefficient is shown for psychosocial wellbeing and total quarterly income; Spearman's Rho is displayed for self-rated health and employment.
*p < 0.05; **p < 0.01; ***p<0.001