The influence of childhood SES on perceived neighborhood cohesion and levels of physical activity among older adults

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Abstract: Older adults who reside in cohesive neighborhoods are more likely to be physically active; however, no research has considered whether individuals who live in these neighborhoods are more likely to do so due to childhood poverty. I utilized a sample of 8637 individuals from the Health and Retirement Study. Using a structural equation modelling approach, I examined whether neighborhood social cohesion mediates the relationship between childhood SES and later life physical activity. I also examined differences by gender and race. Neighborhood social cohesion was significantly and negatively associated with childhood SES. There was a significant indirect effect between childhood poverty and physical activity. Furthermore, there were significant indirect effects through current levels of education and wealth. Future studies of the relationship between neighborhood social cohesion and health behaviors and outcomes among older adults should control for the influence of childhood poverty. Differential selection into neighborhoods may play a role.

Introduction

Although regular physical activity yields major health benefits, many older adults do not participate in the recommended levels (Nelson et al., 2007). Social cohesion is associated with increased levels of physical activity among older adults (Robinette, Charles, & Gruenwald, 2018); it is defined as the "mutual trust and solidarity among neighbors" (Sampson, Raudenbush, & Earls, 1997; pg. 919). Neighborhood social cohesion may be especially important for the older adult population, as they are more likely to experience functional limitations that prevent them from driving, spend more time in their neighborhoods, and experience greater residential stability (Clarke & Nieuwenhuijsen, 2009). Neighborhood cohesion may promote physical activity by creating an environment where individuals model healthy behaviors for each other. People who live in cohesive neighborhoods may be more invested in neighborhood upkeep and crime prevention, which makes walking feel more safe (Suglia et al., 2016).

Research indicates that socioeconomic status during childhood is associated with later life physical activity behaviors (Tsenkova, Lee, & Boylan, 2017). However, no research has examined whether people who grew up with a low SES are more likely to select into neighborhoods poor in cohesion later in life. The literature does indicate that people who had a low SES in childhood are more likely to move into poor neighborhoods (e.g., neighborhoods with high percentages of people in poverty, who lack insurance, who lack vehicles, etc.) in later life (Van Ham et al., 2014). The literature also suggests a correlation between neighborhood poverty and neighborhood social cohesion, which is hypothesized to be due to factors such as a lack of residential stability (Sampson, Raudenbush, & Earls, 1997; pg. 919). Previous research indicates that neighborhood social cohesion substantially mediates the relationship between neighborhood SES and physical activity among mothers (Yama-Guerrero, Cubbin, & von Sternberg, 2017).

Therefore, the purpose of my study was to examine whether relationship between childhood SES and later life physical activity levels is partially explained by neighborhood cohesion. I present preliminary analyses in this abstract. In the next steps, I will also examine gender differences using multigroup analysis, as one study found the relationship between childhood SES and participation in high school sports was especially strong for men (Pudrovska & Anishkin, 2013). I will also examine race differences; I expect there to be stronger relationships between childhood SES and neighborhood cohesion for blacks due to racial discrimination. In the preliminary analysis below, I study the sample at baseline. In the next steps I will examine the change in physical activity levels four years from the baseline wave; this will help understand whether physical activity levels continue to decrease for older adults as a result of childhood SES.

Methods

Data

Data came from the Health and Retirement Survey, a nationally representative study of older adults and their spouses. The survey uses a multistage stratified area probability sampling

design. First, Metropolitan Statistical Areas (MSAs) and non MSAs were selected proportionate to size. Then, area segments are selected within primary stage units (PSUs). A list of all housing units within each PSU was used to systematically select housing units. The researchers then selected age-eligible members within each housing unit. Individuals who resided in institutions were initially excluded from the survey; however, if they moved to institutions over the course of the study they were still administered a questionnaire. In the HRS, Floridians, Blacks, and Hispanics (majority Mexican heritage) were oversampled (Sonnega et al., 2014). In addition, data from the psychosocial questionnaire were utilized. The psychosocial questionnaire was tested as a pilot in 2004 and has been administered from 2006-2016; this questionnaire was distributed to a rotating half-sample of respondents every 2 years. For this study, the 2006 and 2008 waves were concatenated and used to examine the sample at baseline. The 2010 and 2012 waves will be concatenated to examine change in physical activity levels from the baseline wave.

Parental education was measured by asking individuals "what is the highest grade of school your mother (or father) completed? Respondents were given a 1 if their mother's education is less than 8 years and a 1 if their father's education is less than 8 years. The respondents were also asked about their father's occupation when they were 16. The respondents were given a 1 if their father had a blue collar occupation, which includes protective services, farming/fishing/forestry service, construction and production, and don't know. The following questions were asked to gauge financial status 1) Would you say your family during that time was pretty well off, about average, or poor? 2) Did financial difficulties ever cause you or your family to move to a different place? (yes/no) 3) Was there a time when you or your family received help because of financial difficulties? (yes/no) 4) Was there a time of several months or more when your father had no job? (yes/no). Responses were dichotomized for each question and then summed. Respondents were given a "1" value if they report that they were poor growing up in response to the first question. They were also given a "1" value if they responded "yes" for any of the other 3 questions.

Physical activity was measured in the same way as they are measured by Robinette, Charles, and Gruenwald (2018). Respondents were asked three questions about their physical activity. Respondents are asked "How often do you take part in sports or activities that are vigorous, such as running or jogging, swimming, cycling, aerobics or gym workout, tennis, or digging with a spade or shovel?" to gauge vigorous activity. Respondents were asked "And how often do you take part in sports or activities that are moderately energetic such as, gardening, cleaning the car, walking at a moderate pace, dancing, floor or stretching exercises?" to gauge moderate activity. To gauge light activity, respondents were asked "And how often do you take part in sports or activities that are mildly energetic, such as vacuuming, laundry, or home repairs?" Responses were 1 = every day, 2 = more than once per week, 3 = once per week, 4 = one to three times per month, or 5 = never. Items were reverse coded. The moderate physical activity score was multiplied by 3 and the vigorous physical activity score is multiplied by 5. The scores from all three domains were then added to form a composite score of physical activity.

A scale of perceived neighborhood social cohesion was used. These questions asked respondents how they feel about their local area, specifically, everywhere within a mile of their homes. The respondents were asked to mark one box on a dotted line indicating how strongly they agreed with the following statements: 1) I really feel part of this area/I feel that I don't belong in this area 2) Most people in this area can be trusted/Most people in this area cannot be

trusted 3) Most people in this area are friendly/most people in this area are unfriendly and 4) If you were in trouble, there are lots of people in this area that would help you/If you were in trouble, there is nobody in this area that would help you. Scores were reverse coded. Values for each item ranged from 1 to 7.

Adulthood wealth was utilized as a potential mediator; it was logged to prevent skew. The RAND imputations of total wealth were used. This variable was measured in inflation-adjusted nominal dollars. This measure included the sum of all wealth components less all debt. Whether the respondent had at least a high school education was also included as a mediator. A measure was used that indicated whether a respondent has a neurotic personality (sensitivity to negative emotions and predisposition to depression and anxiety). I included this measure because trait neuroticism may cause an individual to perceive that a neighborhood lacks cohesion even when the neighborhood is fairly cohesive. Age was measured in years.

Statistical Analysis

I prepared the data for analysis using SAS version 9.4. I utilized MPLUS 8.1 for data analysis. After examining the descriptive statistics, I examined the fit of the measurement models for neighborhood cohesion and neuroticism variables. I then examined the full structural equation model. The comparative fit index (CFI), the root mean square of approximation (RMSEA), and the Tucker Lewis Index (TLI) were used to measure model fit. I used the WLSMV estimator due to the categorical nature of the cohesion and neuroticism variables. I examined the significance of the indirect effects using the Sobel test.

Results

Table 1 presents weighted descriptive statistics of the main analysis variables. The average age of the sample was 65. Approximately 14% of the sample had less than a high school education.

Table 1. Weighted means and percentages of the analysis variables in 2006/2008 (n=8637)

Variable	Means and Percentages
Neighborhood Cohesion (mean)	5.58
Neuroticism (mean)	2.04
Activity Level (mean)	24.12
Less than high school education (%)	14.20%
Wealth	11.60
Childhood SES score (mean)	3.50
Age (mean)	65.11

The model had adequate fit (CFI=0.95, TLI=0.94 , RMSE=0.06). Table 2 displays the direct and indirect effects linking childhood SES to later life physical activity. Lower childhood SES was negatively associated with neighborhood social cohesion. Neighborhood social cohesion was positively associated with physical activity. Furthermore, there were significant indirect effects linking childhood SES to lower levels of physical activity in later life.

Table 2. Standardized regression coefficients and standard errors for direct and indirect effects of childhood SES to physical activity in later adulthood

Regression Coefficients	Coefficient (SE)
Childhood SES->physical activity (direct effect)	-0.02***(0.04)
Neighborhood cohesion-> physical activity (direct effect)	0.11***(0.01)
Childhood SES->neighborhood cohesion->physical activity (indirect effect)	-0.01***(0.002)
Childhood SES->less than high school->physical activity (Indirect effect)	-0.01***(0.002)
Childhood SES->wealth->physical activity (indirect effect)	-0.01***(0.001)
Childhood SES->less than high school education->wealth->physical activity (Iindirect effect)	-0.01***(0.001)
Childhood SES->wealth->neighborhood cohesion ->physical activity (indirect effect)	-0.002***(0.001)
Childhood SES->less than high school education->wealth->neighborhood cohesion->physical activity (indirect effect)	-0.001***(0.001)

Discussion

Results from my preliminary analysis suggest that childhood poverty influences levels of neighborhood cohesion in later life, which subsequently results in reduced physical activity levels. This may be due to differential selection into neighborhoods. Neighborhood selection is one of the main dilemmas facing scholars who study the neighborhood. Health benefits of neighborhoods may simply be an artifact of healthy or less advantaged people selecting into neighborhoods.

One limitation is that I cannot determine objectively whether the neighborhood is more cohesive or less cohesive. People who grew up with low SES may be less likely to perceive a neighborhood as cohesive. Although I control for this somewhat by including a neuroticism variable, there could still be some unmeasured differences in perception. Furthermore, the indirect effects are small despite being statistically significant.

To conclude, neighborhood social cohesion mediates the relationship between childhood SES and physical activity levels among older adults. Some of this relationship is explained by differential educational and wealth attainment in adulthood. Thus, controlling for childhood socioeconomic status using retrospective measures available when conducting neighborhood research may be implicated.

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