Adolescent Mental Health: Neighborhood Stress Effects on Emotional Distress.

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Extended Abstract.

Introduction.

The role of neighborhood effects on health and other behavioral outcomes (e.g. drug use or crime) has been a focus of social demography/ecology and sociological work arguably from the beginnings of modern sociological practice (e.g. Wirth) and has witnessed a resurgence and focused effort of work since the later 1980's based on the theoretical arguments, empirical observations, and methodological advances of the discipline (e.g. Coleman 1988; Wilson 1987; among others). This paper will investigate the influence of neighborhood context on emotional distress among youth. The majority of research on adolescent mental health has generally not emphasized the role of contextual factors such as neighborhood disadvantage or disorder conditions (see Wilson 1996 or Massey 1996). While such contextual conditions have been linked to general health for adults and children specific links to mental health are under-explored (e.g. Ross and Mirkowsky, 2001; Robert, 1998; Elliott et al., 1996). The goal of this study is to explore directly the role of neighborhood characteristics, especially the effects of community disadvantage and instability, on emotional distress and specifically asks if neighborhood-level variables have a direct and/or moderating effect on mental distress net of individual, family, and peer characteristics. Specifying the link between aggregate-level social/economic context variables and individual-level variables will lead to a more comprehensive understanding of how the environment impacts adolescent mental health.

Neighborhood influences on individual behavior reflect an ecological approach to social phenomenon. The mechanisms behind contextual analysis include contagion theories, collective socialization, competition theories, general stress, and relative deprivation (Jenks & Meyer, 1990). Mechanisms specific to general health have emphasized how context may generate stressors, exposure to negative conditions (e.g. victimization), limit physical activity, and can even create physiological reactions (such as hypertension) through chronic exposure (see Ross and Mirowsky, 2001). In addition to these direct effects, neighborhood context can operate to moderate or influence the effects of individual risk and protective factors. For example, highly disadvantage or unstable contexts may interact to dampen effects of direct family/parental efforts to exert control/monitoring over children or instability may lead to greater influence of peers.

Neighborhood characteristics – physical, structural and social – are related to mental health outcomes (Wandersman and Nation, 1998). Studies that focus on adult mental health outcomes find that neighborhood economic disadvantage influences major depression and substance abuse (Silver, Mulvey and Swanson, 2002) and mental illness (Goldsmith, Holzer and Manderscheid, 1998). Neighborhood poverty has been associated with poorer quality home physical environment and less maternal warmth (Klebanov, Kato, Brooks-Gunn, & Duncan, 1994) which may indirectly impact adolescent

behavior and mental health. Multiple measures of neighborhood low socioeconomic status have been associated with adolescent mental health. Aneshensel and Sucoff (1996) found that neighborhood conditions, specifically low socioeconomic status and racial/ethnic segregation influence adolescent mental health (depression, anxiety, oppositional defiant disorder, and conduct disorder) by shaping perceptions of the neighborhoods and perceptions of one's neighborhood as dangerous then impacts the mental health of adolescents. In predicting hopelessness among adolescent suicide attempters, Perez, Spirito, and Boergers (2002) found that adolescents who lived in neighborhoods with weak social networks reported higher levels of hopelessness, even after controlling for SES and depression. Interestingly, McLeod and Edwards (1995) finds that the effects of residential characteristics – poverty, urbanization and racial/ethnic composition – vary by race and ethnicity.

In research on adolescent health and development integrating neighborhood context is becoming more common and yields noteworthy results. Despite this trend, few studies to date have directly incorporated a neighborhood-level analysis of adolescent emotional distress. This study adds to this endeavor.

Methods.

Data for this paper are from adolescents in the Seattle metropolitan area from 1998 to 2003 and maps Census data to the addresses of the adolescent's home address. The Reconnecting Youth (RY) prevention research project is a random sample of high school youth (aged 14 – 19) stratified on school performance; low performers were over-sampled. The dataset includes mental health/distress outcome variables and measures of personal and social resources, as well as basic family and parental background information (e.g. household composition, parent education/occupation).

Sixteen high schools in the Seattle and surrounding school districts participated in health/drug use interventions and/or surveys over the period.[1] All participating youth were assented and parents provided consent in accordance with approved UW IRB protocols. The total sample was 2,025 respondents in the combined dataset.

At the neighborhood level, data are compiled from the 2000 U.S. Census and matched to individual records, following from existing research on neighborhood analysis (Billy & Moore 1992; Crane 1991; Ku et al. 1993). Student addresses from the individual-level dataset are linked to the appropriate census tract for each case using the web-program, American Fact Finder.[i] All census tracts that contain fewer than five individuals from the sample are aggregated with contiguous census tracts.[ii] After completing the matching and aggregation process, there are 113 census tracts in the contextual level dataset from the city of Seattle and the surrounding areas.

Building on previous work, this analysis assesses the influence of neighborhood context on adolescent drug use behaviors by using a rich individual-level data set. The inclusion

[1] The analyses use data from three separate RY study sources conducted between 1998 and 2003: "Preventing Drug Abuse: Parents and Youths with Schools." (NIDA), "Reconnecting Youth: Replication of an Indicated Prevention Program in Multicultural Settings" (Department of Education-DoE) and "Assessing Suicide Risk among Adolescents" (CDC). The first two studies included the implementation of a comprehensive substance use indicated prevention program that targets high school aged youth at risk of school dropout. The sampling and recruitment process and sampling frame were consistent across all three studies.

of detailed data at the individual level is uncharacteristic of most research in this area. In addition, the extensive dataset on high-risk youth (at risk of academic failure) and comparable non-risk youth is noteworthy. The over sampling of high-risk youth is a strength of the individual-level data set; this stratification should produce variation potential distress given school dropout/poor performance has been related to a variety of negative outcomes including mental health problems. This type of data will enable us to more accurately identify if and how neighborhood conditions influence mental health behaviors.

Measures.
All outcomes and individual level independent variables come from the Reconnecting Youth High School Questionnaire (HSQ), a detailed self-report questionnaire capturing a range of youth behaviors including substance use, peer and family relations, and school behaviors. The HSQ is designed to use a minimal number of indicators to capture a broad range of risk and protective factors associated with a set of diverse risk behaviors.

Outcomes. Measures of mental health and distress are scales derived from known scales (e.g. CES-D depression scale) or single indicators of presence or absence of occurrences (e.g. made a suicide attempt in the past year). Separate scales of depression, anxiety, hopelessness, and suicide risk behaviors (attempts, threats, and ideation) are created; in addition we use a clinical screen that captures a general presence/absence of suicide risk that has shown clinical validation with in-depth follow-up interviews. The depression scale is based on six questions about depressed affect derived directly from the CES-D. The anxiety scale consists of four items about feeling anxious. The hopelessness scale includes three responses about life satisfaction and despondency. The suicide risk behaviors scale contains five measures based on suicidal thoughts and feelings. The scales have reliabilities between .80 and .89 across different surveys.

Explanatory Variables. We specify the individual-level model in great detail in order to minimize the possibility that unexplained variance is due to omitted individual characteristics. We include measures of psychosocial risk and protective factors including concurrent substance use, peer group characteristics, demographic characteristics, mobility, family structure, and parent's educational attainment and occupation.

There are four measures designed to capture the psychosocial risk and protective factors: *personal control*, *family support*, *deviant peer bonding*, and *conventional peer bonding*. *Personal control* reflects a mean score based on five items tapping into personal agency and coping abilities. *Family support* is based on the extent of help provided by immediate family members comprised of four items. *Deviant peer bonding* captures the amount of close friends involved in six different delinquent behaviors. *Conventional peer bonding* includes the amount of close friends engaged in five types of constructive, law-abiding activities.

Ethnicity (white, African American, Asian, and other) along with the respondent's age and sex are included. Prior mobility based on the number of prior middle and high schools attended prior to the baseline survey. *F*amily structure, representing living with both natural parents, reconstituted households, single parent and other, will be included. Finally, the *parent's educational attainment* and parent's occupation based on the youth's report is included.

Neighborhood Explanatory Variables. Measures of neighborhood characteristics are designed primarily to represent economic disadvantage and instability in the neighborhoods as represented by the census tract unit. We have basic measures from the US Census: poverty and income measures, unemployment, residential stability, female-headed households, racial/ethnic composition and segregation, and have local Seattle crime rates record by tract. We will use separate indicators as well as creating a composite measure to represent *Neighborhood Disadvantage* based on a scale constructed by Sampson and collaborators. (1997). This index is composed of a mean of four indicators of economic disadvantage at the census tract level: percentages of residents below the federal poverty level, households headed by a female, residents receiving public assistance, and residents aged 16 years or older that are unemployed (Cronbach's Alpha = 0.82). .

Statistical Approach.

The analysis focuses on the influence of the surrounding neighborhood context for individuals mental health as gauged by the outcome measures above. Multilevel techniques (hierarchical linear models-HLM) will be used to assess the impact of context on emotional distress. A hierarchical model explicitly incorporates variables at the individual-level and at the aggregate-level and accounts for the clustering of individuals in aggregate unit. HLM allows key parameters of interest at the individual level to vary across local contexts and our interest is to see if this variation is systematically associated with neighborhood factors (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999). For reasons outlined, we expect neighborhood factors such as poverty and income measures, unemployment, residential stability, female-headed households, racial/ethnic composition and segregation, and crime rates to influence: 1) levels of emotional distress directly and 2) to act as moderators affecting risk and protective factors (i.e. context interacts with key individual stressors and individual resources).

The approach will be to run baseline models that include individual effects of personal and family risk/protective factors and peer factors, plus basic control variables (e.g age). The generalized individual-level equation (1) below indicates such a formulation where emotional distress (D) is a function of key factors and where the subscript i represents individuals and g represents neighborhood.[2]

(1) $D_{ig} = B_{0g} + B_{1g}$ (personal factor) + B_{2g} (family factor) + B_{3g} (peer factor) + B_k (i.e., age, sex) + e_{ig}

Note the intercept and the coefficients for personal, family and peer are allowed to vary across contexts, while we specify fixed effects for the control factors (no g subscript). Presence of significant variation in these parameters across context can be assessed and, if present, variation in these parameters will be related to neighborhood characteristics.[3]

[2] We observe minimally from 5 and average 16 individuals per tract which would allow an estimation of random effects (individual effects that vary across neighborhoods) for modestly complex models that incorporate 3 to 5 risk factors from these three domains (person, family, and peer). Note for fixed effects the N within tracts is not a factor since these effects are based on the total sample size.

[3] Models can be applied to continuous, such as our proposed emotional distress scale, or to dichotomous/discrete outcomes, such as attempted suicide or not in the past year.

We will specifically explore the variation in the parameters of person, family, and peers. In this case we model that variation in $B_{1g,}$ B_{2g}, and $B_{3g,}$ as functions of neighborhood factors. For example:

(2) $B_{1g} = g_0 + g_1$ residential mobility + g_2 poverty + g_3 unemployment + g_4 crime + u.

Simple interaction between contextual and individual-level variable will be tested. The statistical evidence for neighborhood moderating effects would be demonstrated by statistically significant g parameters. In general, these models add interactions between neighborhood variables and the individual effects that have random coefficients, in essence capturing moderating effects of neighborhood.

Discussion.

In our current work looking at drug use among adolescents we have shown both direct effects of neighborhood disadvantage on use and moderating effects of both neighborhood instability and disadvantage on effects of parental support/family functioning and peer behaviors. We expect to find similar effects as we move to look at emotional distress response of adolescents.

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[i] A majority of the individual cases were matched using the American Fact Finder. There were 79 remaining cases that could not be matched using this method. For 27 of those cases, we used Reverse Directory (a web-based program which locates an address based on a telephone number) and the FFIEC Geocoding System to locate their census tract. For 41 of the remaining 52 cases, we had zip codes for the students, but no street address. In these cases, census tracts contained within each zip code were weighted based on population size, and one census tract was chosen for each individual by a random process. Finally, the 11 cases without any information for locating a student address were dropped from the sample.

[ii] There were 100 census tracts that were aggregated with contiguous tracts in order to contain at least 5 individuals. This was done in a two-stage process. First, all geographically contiguous census tracts were located for each tract with less than five cases. Second, one tract was chosen by a random process for aggregation with the original census tract. The original census tracts took on the value of the randomly generated contiguous census tract. If the randomly generated census tract had fewer cases than the original census tract, the original census tract was used for both. If more than two census tracts had to be aggregated, each tract had to be contiguous with at least one other tract.