"Aggravating conditions: Cynical hostility and neighborhood ambient stressors"

ABSTRACT

Objective: This study is perhaps the first to investigate neighborhood clustering of personality. The present analysis examines the roles of neighborhood conditions, early life and current stressors, and individual sociodemographics in predicting cynical hostility. *Design:* Clustered prospective data are from 3,094 adults weighted to be representative of Chicago. ***Results:*** The analysis first documents variation in cynical hostility by neighborhood which is larger than that for selected health outcomes commonly studied in ecological context or for other personality measures. Controlling for neighborhood context reduces the black/white difference by one-third. When individual factors are controlled for, a measure of neighborhood ambient stressors (notably noise) significantly predicts cynical hostility, and the effect size is larger than that of other contextual predictors. ***Conclusions:*** The findings underscore a clear role for neighborhood research in psychology and also show the potential benefit of research on ambient stressors for health policy.

Keywords: cynical hostility; personality; neighborhoods; ambient stressors; noise

The idea that the urban environment may influence personality has a long history, but has been the subject of little empirical analysis. A number of early social theorists voiced concerns about the potential negative effects of modern urban living on human social interaction. Simmel theorized that population density and sensory stimulation in the urban environment reduced social integration and trust or concern for others by producing mental overload. In his view, because individuals could not process all the social and sensory demands in urban environments as they would in rural areas, they mentally retreated from others, delineating interpersonal boundaries of mistrust and rational calculation and basing their behavior on the assumption that others do the same (Simmel, 1903 (1950); Wirth, 1938). Milgram (1970) elaborated on the concept of systemic overload as the mechanism linking ecological conditions and interpersonal relations, suggesting that overload results in (1) less time spent processing each input, (2) selective disregard of information, (3) shifts in boundaries of social responsibility, (4) blocking certain inputs such as by screening social interactions, (5) reduced intensity of social interactions (filtering), and (6) the creation of institutions to handle the inputs the individual can no longer handle.

Fischer called for empirical tests of such claims, and suggested applying the Chicago School's analysis of intra-community variation to the analysis of personality (1972; 1975). Regardless of whether ecological variation in personality was due to residential mobility or resulted from urban conditions, "[b]y analyzing the relationship of settlement to the theoretically significant consequences of the Great Transformation, individuation, normlessness, and the like, urban sociology informs general sociology's main concern", "the nature of the moral order (Community) and of the individual within that order (personality)" (Claude Fischer, 1975, p. 68). The main barriers he saw to such analysis were problems of measurement, both of

ecological conditions and of psychosocial traits. The intervening 35 years, however, have seen a transformation in both urban measurement and in survey psychology, although the two have rarely intersected.

Meanwhile, "neighborhood effects" on physical health have been well-documented, and the initial use of socioeconomic and racial composition variables as proxies has given way to an exploration of specific, policy-relevant, and potentially causal attributes. Most of the work on residential context and mental health, though, has been limited to a few outcomes, primarily depression, which has been linked to features of the physical (perception of physical disorder, poor quality of the neighborhood built environment, traffic problems, lack of green space or services, and lower walkability) and social environment (social capital, exposure to violence and social hazards, and residential stability) (Mair, Diez Roux, & Galea, 2008). These and other physical and social conditions are hypothesized to affect health partly by acting on stress responses, and partly by influencing health-related behaviors such as physical activity, consumption, and social interaction. A related (but often separate) literature on environmental health investigates direct effects of environmental attributes such as pollution, toxins, noise, and pathogens.

Neighborhoods and Psychology

These findings from the mental health literature suggest that environmental factors could also influence personality, yet such analysis is nearly absent from the field of psychology. In one investigation, Hart, Atkins, and Matsuba (2008) found that neighborhood economic deprivation significantly increased maladaptive personality changes in preschool children, but failed to identify any variable which explained the relationship, including a measure of neighborhood

informal social control (collective enforcement of norms). Discussion of environment in psychology tends to center around the role of the childhood family or school atmosphere. This is largely due to evidence that relative position within an age cohort with respect to the deep structure of personality changes little after age 30 (Terracciano, Costa Jr., & McCrae, 2006). However, evidence from positive psychology and intervention research shows that some features of personality can change. Moreover, studies of personality development over time (Roberts & DelVecchio, 2000) reveal substantial unexplained variation, despite increasing stability with age even after age 30.

Cross-cultural psychologists have also documented considerable geographic variation in personality among different national, regional, and cultural groups (Rentfrow, 2010; Schmitt, Allik, McCrae, & Benet-Martínez, 2007). In those cases the focus is on how individual personalities aggregate to form a national cultural character, not specifically on population heterogeneity or ecological causation. (This cross-national variation is not argued to be due to selective mass-migration. Although community differences in personality may result to some extent from population mobility, geographic variation would still be of vital interest to researchers on the social and environmental correlates of well-being.) Nations and states, however, are not the appropriate level of analysis; rather, because social life is "conducted in microscopic personal realms," aspects of personality which are relevant to social interaction within the community should be evaluated at the community level (Claude Fischer, 1972, p. 69).

Tests of neighborhood effects on personality in sociology (rather than in psychology) are also rare. The most notable come from the work of Catherine Ross and colleagues and focus on the study of mistrust. Ross, Mirowsky, and Pribesh's (2001) theory of interpersonal trust sees mistrust as an outcome of competition in resource-scarce neighborhoods, where crime is high

and individuals feel powerless to avoid or manage the threat. Their multilevel structural equation model empirically confirms that perceived neighborhood disorder (which is common in disadvantaged areas) is directly related to mistrust; there is also an indirect relationship as mistrust increases residents' perception of powerlessness. The relationship between perceived disorder and their measure of mistrust is stronger among individuals who perceive that they are powerless to change their circumstances. Trust is considered an important positive contributor to the formation of social ties, which connect individuals to a network of relationships in which social capital, including a sense of values and social control mechanisms, is embedded. Their explanation seems to suggest that mistrust is a rational response to the prevalence of threats due to norms violations (C. E. Ross & Jang, 2000; C. E. Ross & Mirowsky, 2009).

An alternative to the rational response view focuses on hostility as a form of stress reactivity; this approach is consistent with Simmel's explanation of cynicism as cognitive distancing due to sensory overstimulation. Recent research on biological reactivity in response to stress has outlined central neural and peripheral neuroendocrine responses which function to prepare an individual for a challenge or threat (Boyce & Ellis, 2005). Both genetics and developmental experience shape individuals' stress reactivity profiles, and these response patterns are context dependent. According to Boyce and Ellis (2005), people exposed to either high or low levels of adversity are more likely to develop high reactivity phenotypes, and thus to both be at increased risk under adverse conditions and experience a greater protective effect under positive conditions. Laboratory research has shown that hostile individuals are more likely to display angry behavior and increased blood pressure when provoked, although they showed no differences when at rest (Fredrickson et al., 2000; Suarez & Williams, 1989). At least one neighborhood study is consistent with this hypothesis: Wen, Hawkley, and Cacioppo (2006)

found that psychosocial attributes including hostility partly explain the effects of perceived neighborhood environment quality on health.

The Physical Environment, Ambient Stressors, and Personality

By 2006, fewer than 5% of neighborhood effects studies had considered ambient stressors (e.g. noise, traffic, and air quality) or other physical hazards (Boardman et al., 2008; Entwisle, 2007) with respect to any outcome, and only two had then looked at neighborhood hazards in relation to emotional well-being. In those studies, the environmental hazards were industrial facilities: Boardman and colleagues (2008) used spatial analysis of industrial activity and an environmental risk/social stressor framework to examine the relationship between proximity to industry and the psychological well-being of nearby residents. They found that gender, occupational status, and family structure interact with industry's effects, that influences are more pronounced among women, but that gender differences are also contingent upon occupational and family statuses. Downey and Van Willigen (2005) found proximity to industrial activity were negatively related to mental health, both directly and mediated by perceived neighborhood disorder and personal powerlessness, with a greater impact for poor and minorities.

Other research focused on emotions and ambient stressors in the environment – including noise, air quality, traffic danger, crowding, and weather – is less developed, though landscape architects have paid considerable attention to the mitigating effects of green space. Weather (temperature, wind power, and lack of sunlight) influences negative affect (Denisson, Butalid, Penke, & Aken, 2008), suggesting that other aspects of the weather may be relevant to emotion. A study in which residents were randomly assigned to buildings with different levels of

vegetation found that residents reported lower levels of fear, fewer incivilities, and less aggressive and violent behavior in areas with more vegetation (Kuo & Sullivan, 2001). However, highway vegetation was found to mitigate driver frustration, but not anger (Cackowski & Nasar, 2003). Vehicular burden, density of major streets, and green parkland ratio predict higher depressive symptoms and lower general health status (Song, Gee, Fan, & Takeuchi, 2007). Substantial research documents psychological consequences of crowding (Gove & Hughes, 1983; Wells & Harris, 2007). Dense traffic areas produce noise, air pollution, and a perception of traffic danger (Frank et al., 2006) – all potential aggravating conditions.

Research specifically focusing on psychosocial and health effects of environmental noise is noticeably rare (Moudon, 2009). One study found that boys in disorganized, noisy home environments (in comparison with boys in calm homes) became more negative in affect with age (Matheny & Phillips, 2001). Likewise, analysis from the Monitoring the Future study (Kumar, O'Malley, & Johnston, 2008) found a relationship between students' problem behaviors and the quality of the school physical environment. Noise, poor housing quality, and crowding raised physiological stress markers in a low-income, but not in a middle-income sample of children (Gary W. Evans & Marcynyszyn, 2004). Likewise, children experienced increases in blood pressure, and the stress markers epinephrine and norepinephrine, but not in cortisol, when a new airport opened near their homes (G.W. Evans, Hygge, & Bullinger, 1995). Aircraft noise outside the school also inhibits cognitive development and increases overall annoyance (S. A. Stansfeld et al., 2005). In a prospective study of adult males, road traffic noise did not predict incidence of overall minor psychiatric disorder, but there was some evidence for a relationship with anxiety levels (S. Stansfeld, Gallacher, Babisch, & Shipley, 1996). Like other measures of risky ambient conditions, noise levels tend to be higher in poorer areas (Gary W. Evans & Kantrowitz, 2002).

Cynical hostility, heart disease, and social isolation

Cynical hostility, measured by the Cook-Medley scale, is a psychological construct which amplifies a sense of mistrust of others with suspicious antagonism. Cynical hostility is important because it influences social relationships, sense of well-being, and biological health, and seems likely to engender crime and discourage civic engagement and social responsibility. The Cook-Medley cognitive hostility construct incorporates three sub-component beliefs: " that others are motivated by selfish concerns" (cynicism, the present focus), "that others are likely to be provoking and hurtful" (mistrust), and the that others are "dishonest, ugly, mean, and nonsocial" (denigration) (T.Q. Miller, Smith, Turner, Guijarro, & Hallet, 1996). Hostility is well-established as an important predictor of coronary heart disease and all-cause mortality (Boyle et al., 2004; T.Q. Miller et al., 1996) and has been associated with inflammation (Graham et al., 2006) and poor pain management (Fernandez & Turk, 1995). Prior research shows social and racial/ethnic disparities in hostility similar to those for cardiovascular outcomes (Scherwitz, Perkins, Chesney, & Hughes, 1991). Just as social support is strongly protective against coronary heart disease (Smith, Fernengel, Holcroft, Gerald, & Marien, 1994), socially isolated individuals report higher hostility; it may be that cynical hostility and social isolation may each increase risk of the other, forming a downward spiral (Brummett et al., 2001; Gallo & Smith, 1999; Houston & Kelly, 1989). While researchers have primarily focused on cynical hostility as a predictor of cardiovascular dysregulation, personality attributes have indirect health effects extending well beyond any single outcome, and work through health behaviors, employment opportunities, and social relationships as well as through stress processes.

The Present Investigation

Using cross-sectional clustered individual data representative of Chicago and a diversity of ecological measures, this study documents and suggests an explanation for spatial patterning of cynical hostility. The analysis first documents the extent to which hostility varies by neighborhood and between social groups, and how race/ethnic and socioeconomic disparity patterns differ when local context is held constant. It then investigates whether local ambient stressors, including noise, traffic danger, and poor air quality, predict hostility after childhood environment and stressful life experiences have been controlled for. In this model, socioeconomic features of the community such as neighborhood disadvantage have no direct effect on cynicism; that is, they are important only as they predict local ambient environmental stressors.

However, although ambient stressors are clearly a major source of sensory overload, they also can constitute a kind of breach of trust within local residential communities by residents and by those with power over urban design and quality – a rational response to norms violations hypothesis. Moreover, arguments could be suggested for a variety of alternate possible ecological causal explanations of neighborhood clustering of cynicism, such as Ross and colleagues' rational response to norms violations explanation, Fischer and Simmel's mention of population density, and the connection with social integration (as well as to roles for selective migration or personality contagion not explored here). Therefore, this study takes both a confirmatory and an exploratory approach by first testing the hypothesis that ambient stressors predict cynicism independent of neighborhood socioeconomic status, and by then comparing the size of this effect with the sizes of effects of other alternate ecological predictors.

Method

Study Sample

The Chicago Community Adult Health Study (CCAHS) is a prospective multi-level study of the impact of individual and social environmental factors on health, their role in understanding socioeconomic and racial-ethnic disparities in health, and the biological, psychosocial, and behavioral pathways that are involved. The CCAHS is a probability sample of 3,105 adults age 18 and older in the city of Chicago who were interviewed in person, with a response rate of 71.8%. The 2001-3 sample is drawn from all of the 343 neighborhood clusters (NCs) and covers the entire city, with an average of 9 respondents per NC. These NCs were developed and characterized by the Project on Human Development in Chicago Neighborhoods (PHDCN); each contains approximately two contiguous census tracts which were relatively homogeneous in terms of socioeconomic status. Analyses are weighted to represent Chicago's 2000 Census population in terms of age, race/ethnicity, and sex. Summary statistics appear in Table 2; 3,094 respondents had valid responses for all measures.

Measures

Adult cynical hostility. The use of a widely validated measure for the outcome variable is a key asset of the present study. Because there are a number of scales measuring these concepts, the CCAHS relied on the work of Miller and colleagues (T.Q. Miller, Jenkins, Kaplan, & Salonen, 1995; T.Q. Miller et al., 1996), who analyzed the psychometric properties of the 50-item Cook-Medley hostility scale (Cook & Medley, 1954) and reviewed 45 studies of its relationship with physical health. Of the three subcomponents of hostility as defined by psychologists, mistrust has received the most attention in sociology. The focus is on trust as a

form of social capital in economic social interactions (e.g. (Fukuyama, 1995)) or neighborhood civic relations (e.g. (Marschall, 2004)) rather than on cognition. Measures vary. For instance, to create their mistrust scale, Ross and Jang (2000) asked respondents to tally the number of days in the past week they "felt it was not safe to trust anyone, "felt suspicious," and "felt sure everyone was against you." This operationalization may pick up on paranoia as well as mistrust as defined by psychologists.

The present dependent variable is a principle components factor of responses to five questions[1] from the cynicism subscale of the well-validated Cook-Medley hostility scale (Cronbach's alpha = .73). Each respondent was asked the extent to which they agreed with the following statements:

1. "Most people inwardly dislike putting themselves out to help other people,"
2. "Most people will use somewhat unfair means to gain profit or an advantage rather than lose it,"
3. "No one cares much what happens to you,"
4. "I think most people would lie in order to get ahead," and
5. "I commonly wonder what hidden reasons another person may have for doing something nice for me."

These questions were coded on a four-point scale from strongly disagree to strongly agree. Results are roughly distributed normally and are coded so that higher scores are associated with higher hostility.

Demographics. Gender is coded such that males are treated as the reference category. I examine racial differences between non-Hispanic whites (the reference), non-Hispanic blacks, Hispanics, and other non-Hispanics. I include dummy variables for different age groups (30-39, 40-49, 50-59, 60-69, and 70 years and over), with 18-29 as the reference group. I include dummy measures of the number of years of education, (12-15, and 16+), with 0-11 as the

[1] Survey staff selected eight of the thirteen questions on the Cook-Medley cynical hostility subscale for a pretest of over 200 respondents; analyses of the pretest results suggested that the scale could further be narrowed to five items.

reference category. Dummy variables represent first and second generation immigrants, with immigration status of third generation and beyond as the reference category. Finally, household income is also represented by dummy indicators of income $15,000-$39,000, $40,000 or more, and missing income, with less than $15,000 as the reference category. In bivariate analyses (Table 2), non-Hispanic blacks, Hispanics, and others report more hostility than non-Hispanic whites, and males more than females. Hostility declines with education, income, immigration generation, and non-monotonically between ages 18 and 59, with modest declines thereafter.

*Childhood Experience*s. Given that personality traits are partly molded in childhood, and parental SES (Cohen, Janicki-Deverts, Chen, & Matthews, 2010; Harper et al., 2002) and parenting style (Taylor, Lerner, Sage, Lehman, & Seeman, 2004) have been shown to relate to adult hostility, I include two measures of respondents' childhood material and emotional environment. Including childhood environment also helps to isolate the role of context at different stages of the life course (Wheaton & Clarke, 2003), given that childhood and adult life conditions are correlated, these conditions may structure residential mobility, and the emphasis here is on the adult neighborhood context. I include hunger as a proxy for childhood socioeconomic status as experienced by the respondent as a child, and perception of love as a measure of the emotional environment in the childhood home. Respondents were asked if they "never," "rarely," "sometimes," "often," or "almost always" went to bed hungry; the most frequent response was "never." Likewise, respondents were asked if they "never," "rarely," "sometimes," "often," or "almost always" felt loved; the most frequent response was "almost always." These responses are included as categorical variables, omitting the most frequent response categories. The remaining four categories of each variable are combined into two categories because preliminary analysis revealed similar coefficients within the newly combined

categories. Respondents who report being hungry less often and feeling more loved in childhood report lower hostility. Effects of these self-reported measures of childhood environment may partly result from bias in self-reports in which cynical respondents systematically remember their situation more negatively. Other measures of childhood socioeconomic status, such as parental education and assets, show less consistent relations with hostility, but are also less close to the theoretical model proposed here, which seeks to isolate the roles of material and emotional in producing cynicism. Even if childhood effects are inflated due to systematic self-report bias, childhood factors would be overcontrolled rather than undercontrolled, and therefore not likely to artificially increase the association between neighborhoods and cynicism, which is the focus of the present study.

Stressful Experiences. Acute (event) and chronic stressors are both theorized and documented as contributing to poor health (J. S. House, 2001). Angry distrust logically may result from personal hardship or experience of violence. I include an index of financial stress as a measure of one kind of chronic stress. The index is an imputed mean of responses to two questions about how satisfied the respondent is with their or their family's financial situation, and how difficult it is to meet the monthly payments on their bills. I also include a measure of overall experience of victimization based on the experiences of the respondent and their household while they were living in that neighborhood. The measure is an adjusted mean scale score (mean over the scale items and adjusted for missing data) for (1) violent victimization (such as mugging, fight, or sexual assault), (2) break-in, or either (3) theft or (4) property damage which occurred in the home or outside the home but on the respondent's household property. Again, these controls seek to adjust for neighborhood compositional sources of hostility unrelated to the main neighborhood effect.

Socioeconomic Contextual Variables. To control for socioeconomic context, I use a measure of neighborhood disadvantage developed using principal components factor analysis and 2000 Census NC-level measures. The socioeconomic disadvantage factor loads positively on low family incomes, high levels of poverty, public assistance, unemployment, and vacant housing, and negatively on high family incomes. Other socioeconomic composition factors, such as affluence, residential stability, Hispanic/foreign born composition, and age composition, were not significantly related to cynicism in preliminary analyses.

Neighborhood Ambient Stressors. A measure of the neighborhood ambient environmental stressors is derived from responses to questions about the noise level, air quality, and traffic danger in their neighborhood. Given that using respondent reports of neighborhood quality might bias investigations of psychosocial outcomes, this study aggregates reports from several respondents within the NC, minimizing the importance of the respondent's own response. The NC-level measure is composed of the neighborhood residuals of an empirical Bayesian hierarchical linear model of a factor composed of the three measures (Raudenbush & Bryk, 2002). This process also controls for individual socioeconomic characteristics, adjusts for missing items, and improves neighborhood-level estimates by borrowing information across locations (Mujahid, Diez Roux, Morenoff, & Raghunathan, 2007; Raudenbush & Bryk, 2002). NC-level measures were also constructed for each of the three stressors alone.

No previous reports of validation of these community survey noise, traffic, and air quality questions exist. The perceived noise measure is validated in separate analyses (not shown) by comparing noise reports with trained interviewer ratings of noise, traffic, and street condition (which may cause noise), measures of nearby construction based on aerial photography, and the NC level observed traffic measure, when controlling for sociodemographics and ability to hear in

a noisy room. Results show that while race/ethnicity, age, and income disparities in perception of noise exist, controlling for neighborhood context reduces disparities and the NC-level measures tested are highly predictive of reports of noise. Racial and income disparities in perceptions may reflect variation in residential exposure levels within the NC rather than simply social differences in reporting perceptions; however, to be cautious, standard sociodemographic controls were used when creating the measures. Traffic and air quality measures are similarly validated - pollution measures from the EPA (2002) strongly predict perception of air quality (author citation here). Further, these three questions have been demonstrated to tap into related constructs – an index derived from a principal components analysis of noise, traffic, and street condition measures (not shown) has a Cronbach's alpha of .75.

Other Contextual Measures. The CCAHS contains other widely used NC-level measures of neighborhood quality which could be hypothesized to relate to cynicism. Like the ambient stressors measures, several are scales of multiple questions related to a single perceptual construct: social cohesion, social control, collective efficacy, intergenerational closure, reciprocal exchange, friend/kin networks, organizational participation, institutions, violence, tolerance of deviance, disorder, and safety. Objective ecological measures which may relate to cynical hostility and ambient stressors include noise level, volume of traffic, heavy traffic, very poor street condition, and a disorder scale (Sampson & Raudenbush, 2004). While these measures are objective in that they are measured by a trained rater performing a systematic social observation (SSO), time-varying measures such as noise level and traffic volume may not be very accurate when measured at few time points (Dunstan et al., 2005). Census data on population density supplies a final alternate objective predictor.

Analyses

This analysis focuses on how neighborhood ambient stressors contribute to personal cynicism. The extent to which hostility varies by neighborhood is quantified by computing the intra-class correlation. The first model demonstrates race/ethnicity, gender, and socioeconomic predictors of cynical hostility in an OLS regression. The second model adds measures of childhood and adult stressful experiences which might affect views of others' motivation. Next, using a group-mean centered multilevel model estimated using the HLM software package, which is analogous to a fixed-effects analysis adding a dummy variable for all but one NC, Model 3 examines how consideration of clustering within neighborhood contexts changes estimates of disparities. The group-mean centering is then removed for the remaining models. In Models 4 and 5, NC-level measures of disadvantage and ambient stressors are added to separate models. Finally, in Model 6 the neighborhood ambient environmental stressors scale is added to that model; the socioeconomic measures are present to determine whether environmental stressors act independently of local socioeconomic factors.

Because neighborhood measures are highly correlated and a number of measures could be proposed to lead to cynicism, this study carries the analysis further by investigating possible alternate hypotheses. Ross, Mirowsky, and Pribesh (2001) demonstrated that neighborhood disadvantage, which they conceived of as an indicator of competition for scarce resources, along with survey reports of neighborhood perceived disorder and individual hopelessness, predict their measure of mistrust. They also discuss social cohesion and control, crime, tolerance of deviance, and institutional resources as arising from disadvantage and leading to disorder, but apparently do not test these variables as independent mechanisms for the production of distrust. This is important because so many neighborhood studies have been reporting relationships

between a single predictor and an outcome, without considering whether another variable which is highly correlated might be a better predictor. In this way, the study benefits from combining confirmatory and exploratory approaches.

Table 4 shows the NC-level coefficients from multilevel models in which individual sociodemographics and life experiences are controlled. Each neighborhood-level predictor is considered separately. The predictors are standardized so that their coefficients can be directly compared, in the search for the strongest predictors of cynical hostility.

Results

Descriptive Analyses

The neighborhood contribution to variance in hostility, or intra-class correlation (ICC), is .093, comparable to that for very good or excellent self-rated health and pessimism, and higher than that for some other health-related measures, such as systolic blood pressure, depression, and anxiety, though not as high as for neighborhood social processes such as social cohesion and perception of disorder. Table 1 lists ICCs of selected measures based on author calculations from the CCAHS using same method (but without adjustment for missing data). The ICC is calculated by running a HLM model which clusters individuals by neighborhood but includes no predictors, and then dividing the within-neighborhood variance by the sum of the within- and between-neighborhood variances. Considering that individuals are likely to live in somewhat similar neighborhoods over time, this means that current neighborhood context is an impressive predictor of hostility, in line with neighborhood effects on various other commonly studied health measures.

Additional Analyses

Consistent with Table 2, individual results in Model 1 of Table 3 show that men are more cynical than women. Blacks, Hispanics, and non-Hispanics of other race report more cynical hostility than do non-Hispanic whites. Cynicism varies non-monotonically by age through age 59 and then decreases sharply at ages 60 and over within this cross-sectional sample. Hostility decreases with increases in education and income. In Model 2, both measures of childhood family situation are significantly related to hostility. Compared to the modal normative experience of being loved a great deal and never hungry, respondents who report less love or more hunger also report higher hostility. Of course, cynical respondents might respond more negatively about their pasts, but it is likely that their responses have at least some basis in their family situation. In any case, controls for childhood environment demonstrate that adult experience is relevant to cynical hostility even after considering childhood experience. Financial stress is associated with higher hostility, but the current measure of victimization shows no association with hostility. These variables do explain a small portion of the social disparities in Model 1.

<Table 3 about here>

Inclusion of neighborhood context more markedly changes the estimates of disparities by race/ethnicity and socioeconomic position compared to Model 1, though not by gender or by other factors which often cluster by neighborhood. In a model (Model 3) with group-mean centered individual controls, the gender gap increases while the race, income, and education gaps decrease and age disparities hold constant. Model 4 shows that a commonly used measure of neighborhood socioeconomic status, disadvantage, predicts hostility and contributes to explaining socioeconomic and race/ethnic disparities. However, the ambient stressors measure

in Model 5 is a slightly better predictor. In Model 6, I find that neighborhood ambient stressors are associated with cynicism when neighborhood disadvantage is controlled. In fact, all of the effects of disadvantage on hostility appear to be mediated by ambient environmental stressors. This is corroborated by the changes in the intraclass correlations: the group-mean centered model (Model 3) shows that a considerable portion of the variance is at the NC level (adjusted ICC = .111). Consideration of NC disadvantage or ambient stressors in Models 4 and 5 reduces the adjusted ICC considerably (to .011 or .005), while inclusion of both predictors in Model 6 does not further explain the neighborhood contribution to overall variance in cynical hostility (adjusted ICC = .006).

<Table 3 about here>

The analysis continues by determining whether ambient stressors are the most appropriate proximate available measure to the underlying mechanism relating neighborhood and cynicism. Table 4 shows standardized coefficients of variables hypothesized by Simmel, Fischer, and Ross and colleagues related to cynicism and mistrust, as well as related constructs measured in the CCAHS. The predictors include survey-derived measures including perceptions of disorder, violence, safety, social cohesion, traffic, noise, air quality, toxins; a population density measure from the 2000 Census; and trained observer ratings of disorder, noise level, traffic level, and street condition. Table 3 also reports standardized coefficients predicting cynicism of the ambient environmental stressors components: noise, traffic, and air quality. Standardizing the coefficients across NCs allows comparison of the magnitude of the effects across measures.

<Table 4 about here>

The ambient environmental stressors measure emerges as the strongest predictor. In particular, the noise sub-component (as shown by the objective as well as the perceived noise

measure) is quite strongly associated with cynicism, although the traffic and air quality measures appear to add stability to the stressors factor. A number of the neighborhood quality measures also significantly predict cynical hostility, especially social cohesion, perceived disorder, perceived violence, and availability of services (Table 4). However, each of these variables loses significance when placed in a regression with ambient environmental stressors, while the ambient stressors measure retains its effect (not shown). Supplementary parallel analyses not shown suggest that the ambient stressors measure is more closely related to cynical hostility than to other available psychological measures such as inward anger, outward anger, hopelessness, pessimism, optimism, mastery, depression, or anxiety. This finding of the robust predictive power of the ambient stressors measure suggests that while these other significant ecological predictors are close correlates of cynicism, the relationships may primarily be indirect through their correlations with ambient stressors or with other neighborhood disadvantage measures whose effects are also mediated by ambient stressors.

Discussion

Urban adult cynical hostility is spatially patterned to an extent comparable to health outcomes commonly studied at the neighborhood level and appears to be correlated with environmental features of the residential context. These analyses form the first population-based assessment of the potential role of ambient environmental stressors in individual personality, consistent with Simmel's theory that sensory overload initially produces an aggravated negative understanding of other's motives. The combination of confirmatory and exploratory approaches in this study highlights the importance of comparing multiple theoretical and empirical predictors when analysis is undertaken at the neighborhood level, because confirmatory modeling alone

might establish statistical significance for a predictor which is not the *strongest* predictor available. Spatial patterning partly explains a racial/ethnic disparity in cynicism.

The broader finding that psychological traits can display strong geographic patterning suggests that health researchers should devote more attention to psychology in neighborhood research. Small area variation in psychological phenomena may result from (1) effects of exogenous characteristics of the environment, (2) contagion effects (such that the presence of a concentration of hostile individuals results in an increase in hostility levels of others), or (3) selective migration into or out of neighborhood either explicitly on the basis of these traits or of some correlated processes (Diez Roux & Mair, 2010). The surprisingly large ICCs for psychological characteristics in Table 1, if they can be replicated in other neighborhood samples, demand explanation.

"Personality" factors may be an important pathway through which neighborhood processes create health and socioeconomic disparities. In the case of cynical hostility, the relationship with ambient stressors are a potential explanation of why some poor neighborhoods develop the collective efficacy (or social cohesion and shared hope of working for community well-being) to maintain and improve their surroundings, while other communities "hunker down" and avoid each other. Individuals who interpret their neighbors' intentions as selfish would seem to be less likely to interact positively with them, especially in noisy, stressful surroundings, and more likely to respond with aggressive or violent behavior.

Evidence for spatial patterning in hostility has implications for understanding of racial /ethnic disparities in cynical hostility and of cynicism's contribution to disparities in coronary heart disease. The finding of racial/ethnic and social disparities in cynical hostility is consistent with prior research (Scherwitz et al., 1991). Unlike some studies which found that neighborhood

context statistically explained all or most racial disparities in a health outcome, such as Morenoff and colleagues' study of blood pressure (Morenoff et al., 2008), inclusion of neighborhood context in Model 3 suggests that current spatial context can account for at most about a third of the black/white gap in this cardiovascular risk factor. While it is true that blacks are likely to reside in disadvantaged neighborhoods (which may have higher levels of ambient stressors) for longer spells (Quillian, 2003), this finding suggests that researchers should investigate other potential racial differences as sources of the disparity in cynicism, especially racial discrimination (Williams, Neighbors, & Jackson, 2008). Although self-reports of prejudicial treatment would be difficult to disentangle from cynicism in cross-sectional data such as the CCAHS, longitudinal data and other methods might facilitate further understanding of the role of discrimination in race/ethnic health disparities through psychosocial pathways.

Future research should pay careful attention to the possible roles of personality and emotion in mediating neighborhood effects on physical health. Personality dimensions are not independent of the individual's surroundings, but exist within a social and physical structure in time and space. In particular, psychosocial characteristics may moderate the effects of neighborhood conditions on well-being (Diez Roux & Mair, 2010; Wen et al., 2006). Our knowledge of how human psychology, social relations, and physical health are influenced by our physical surroundings is quite limited. Advances in public health measures, sanitation, nutrition, housing, socioeconomic conditions, and other public health interventions have made major contributions to population health (T. McKeown, 1988; T. J. McKeown, 1976; McKinlay & McKinlay, 1977). Continuing these advances will likely involve expanding our definition of health policy (J. House, 2002) to incorporate housing, land use, transportation, and other urban planning issues as the evidence base grows continues to elaborate the mechanisms connecting

the physical environment and our well-being. Persistent racial and social segregation into neighborhoods of differing environmental quality, along with the disproportionate location of children in areas where poverty is concentrated, suggests that identifying features of environmental quality for which intervention would impact health may be a promising strategy.

Table 1. Neighborhood Intra-Class Correlations (ICCs) for Selected Items from Chicago Community Adult Health Survey 2001-3 (sample sizes vary)

Measure	ICC
Perception of Neighborhood Disorder	0.360
Neighborhood Social Cohesion	0.140
Cook-Medley Cynical Hostility	0.093
Pessimism	0.091
Excellent or Very Good Self-Rated Health	0.090
Depression	0.063
Anxiety	0.068
John Henryism	0.059
Pearlin Mastery	0.057
Inward Anger	0.042
Systolic Blood Pressure	0.042
Self-Esteem	0.037
Diabetes Diagnosis	0.032
Hopelessness	0.026
Outward Anger	0.022

Table 2. Frequencies and Mean Cynical Hostility Scores for Individual Data, Chicago Community Adult Health Survey 2001-3 (n=3,094)

	Frequency	Percent of Sample	Mean Score on Short Cook-Medley Scale
Sex			
Male	1,227	39.7	2.63
Female	1,867	60.3	2.51
Age			
Age 18-29	799	25.8	2.60
Age 30-39	747	24.1	2.57
Age 40-49	607	19.6	2.54
Age 50-59	400	12.9	2.58
Age 60-69	282	9.1	2.53
Age 70+	259	8.4	2.42
Race/Ethnicity			
Non-Hisp. White	981	31.7	2.32
Non-Hisp. Black	1,237	40.0	2.71
Hispanic	798	25.8	2.62
Non-Hisp. Other	78	2.5	2.52
Immigrant Status			
1st Generation	766	24.8	2.58
2nd + Generation	2,328	75.2	2.55
Education			
<12 years of education	789	25.5	2.70
12-15 years of education	1,570	50.7	2.59
16+ years of education	735	23.8	2.34
Income			
$0-14,999	683	22.1	2.71
$15,000-39,999	892	28.8	2.60
$40,000+	946	30.6	2.41
Income Missing	573	18.5	2.54
Perceived Love in Childhood			
Never/Rarely	172	64.0	2.72
Sometimes/Often	941	30.4	2.60
Almost Always	1,981	5.6	2.52
Frequency of Hunger in Childhood			
Almost Always/Often	2,481	16.0	2.52
Sometimes/Rarely	494	3.8	2.68
Never	119	80.2	2.78
Financial Stress			
Lowest Tertile	1,228	39.69	2.42
Middle Tertile	1,158	37.43	2.59
Highest Tertile	708	22.88	2.72
Experience of Victimization			
Lowest Tertile	1,036	33.5	2.52
Middle Tertile	1,030	33.3	2.59
Highest Tertile	1,028	33.2	2.55

Table 3. Cynical Hostility, SES, Experiences, and Neighborhoods (CCAHS, 2001-3)

	OLS		Hierarchical Linear Models with Random Effects			
	1	2	3[a]	4	5	6
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Race (ref=Non-Hispanic White)						
Non-Hispanic Black	0.37 ***	0.35 ***	0.22 ***	0.30 ***	0.32 ***	0.32 ***
Hispanic	0.15 ***	0.13 ***	0.12 **	0.12 **	0.11 **	0.11 **
Non-Hispanic Other	0.20 *	0.20 *	0.11	0.19 *	0.19 *	0.19 *
Female	-0.15 ***	-0.15 ***	-0.20 ***	-0.16 ***	-0.16 ***	-0.16 ***
Age (ref=18-29)						
30-39	-0.03	-0.05	-0.06	-0.05	-0.05	-0.05
40-49	-0.07 +	-0.10 **	-0.09 *	-0.10 **	-0.10 **	-0.10 **
50-59	-0.02	-0.05	-0.05	-0.05	-0.05	-0.05
60-69	-0.14 **	-0.14 **	-0.14 **	-0.13 **	-0.12 *	-0.12 *
70+	-0.21 ***	-0.19 ***	-0.21 ***	-0.19 ***	-0.18 ***	-0.18 ***
First Generation Immigrant	0.06 +	0.07 *	0.06	0.07 +	0.07 +	0.07 +
Education (ref=0-11 years)						
12 Years	-0.10 **	-0.09 **	-0.08 *	-0.08 *	-0.07 *	-0.07 *
13+ Years	-0.24 ***	-0.21 ***	-0.15 ***	-0.19 ***	-0.19 ***	-0.19 ***
Income (ref=$0-14,900)						
$15,000-39,000	-0.06 +	-0.05	-0.05	-0.05	-0.05	-0.05
$40,000 +	-0.14 ***	-0.10 *	-0.07 +	-0.08 *	-0.08 *	-0.08 *
Income Missing	-0.04	0.00	0.00	0.01	0.01	0.01
Loved as child? (ref=A great deal)						
Quite a Bit/Some		0.06 *	0.09 **	0.06 *	0.06 *	0.06 *
A Little Bit/Not At All		0.13 *	0.13 *	0.13 *	0.11 *	0.11 *
Hungry as Child? (ref=Never)						
Rarely/Sometimes		0.09 *	0.07 +	0.08 *	0.09 *	0.09 *
Often/Very Often		0.18 *	0.18 *	0.17 *	0.17 *	0.17 *
Financial Stress Index		0.07 ***	0.07 ***	0.07 ***	0.07 ***	0.07 ***
Total Victimization		0.01	0.00	0.01	0.00	0.00
NC Characteristics						
Disadvantage				0.05 *		0.01
Ambient Stressors					0.06 ***	0.06 ***
Intercept	2.66 ***	2.42 ***	2.51 ***	2.44 ***	2.43 ***	2.43 ***
R^2	0.14	0.16	-	-	-	-
Adjusted ICC	-	-	0.110	0.011	0.005	0.006

*** p<.001, ** p<.01, * p<.05, + p<.1 (two-tailed tests)

a In this model, all covariates were centered around their neighborhood cluster means so that they reflect within-neighborhood effects.

Table 3. Standardized coefficients of NC-level predictors of cynical hostility (CCAHS, 2001-3)
(adjusted for individual sociodemographics and life experiences)

Perceived Measures (Survey)		
Social Cohesion	-0.043	***
Social Control	-0.024	*
Collective Efficacy	-0.022	+
Intergenerational Closure	-0.025	*
Reciprocal Exchange	-0.036	**
Friend/Kin Networks	0.000	
Organizational Participation	-0.001	
Institutions	0.017	
Violence	-0.017	
Tolerance of Deviance	0.049	***
Victimization	-0.043	**
Disorder	0.051	***
Safety	0.037	**
Components and Alternate Specifications of Ambient Stressors (Survey)		
Air Quality	-0.043	**
Dangerous Traffic	0.038	**
Noise Level	0.047	***
Toxins	0.023	+
Ambient Stressors	0.063	***
Objective Measures (Trained Rater or Census)		
Noise Level	0.054	+
Volume of Traffic	0.039	
Heavy Traffic	0.118	
Very Poor Street Condition	-0.068	
Disorder	0.024	**
Population Density	0.000	

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