Perceived Neighborhood Characteristics and the Health of Adult Koreans

by

Youngtae Cho (Utah State University)

Gil-Sung Park (Korea University)

Direct all correspondence to Professor Youngtae Cho, Population Research Lab, 730 Old Main Hill, Logan, UT 84322 (youngtae@hass.usu.edu).

Abstract

This study examines the role of the perception of neighborhood quality with respect to its influence on individual health in Korea. Employing the Quality of Korean Life Survey, 2001, the authors discover that how respondents perceive their neighborhood quality selectively affects the health of Koreans. That is, the extents to which individuals satisfy with neighborhood safety and relationships to neighbors are considerably and significantly associated with self-rated and emotional health status among Koreans, over and beyond individual-level characteristics, while no effect is found for daily activity limitation status. This study also exhibits that most individual demographic and socioeconomic risk factors are associated with health in the pattern consistent with the general findings based mostly on Western societies.

Word counts:
Abstract: 117
Text: 6528

Introduction

There is a traditional saying in Korea: E-oot-sa-chon, which refers cousin-like neighbors. As this proverb suggests, neighbors and neighborhoods have been an important part of life among Koreans throughout history. Culturally, Koreans placed a high value on neighborhood relationships. The characteristics of these relationships took many forms, some of the most common and important being emotional and material support. For instance, when moving to a new neighborhood, one of the first responsibilities a new resident of the community had was to seek out neighbors, often sharing rice cakes as a sign of friendship and goodwill. Although last three decades of rapid industrialization and urbanization have both changed the meaning and withered the importance of neighborhoods as traditional communities, Koreans still expect their neighborhoods to play significant roles within their everyday individual lives.

In contrast to the importance of neighborhoods, there have been few studies focusing on the impact of neighborhood characteristics on the lives of Koreans. In particular, even fewer attempts have been made to examine the influence of neighborhoods on the health of individual Koreans. A number of studies based on Western societies have reported that neighborhood characteristics exhibit significant role on individual health. Therefore, this study attempts to examine the role of neighborhood characteristics with respect to their influence on individual health in Korea. Within this study, we attempt a line of inquiry slightly different than previous efforts in this field. Instead of focusing on the more objective or ecological attributes of neighborhoods, we have chosen to identify and explore the effect of an individual's perception of his or her neighborhood characteristics on an individual's health.

Perceived Neighborhood Characteristics

In recent decades, interest in the effect of neighborhood or community characteristics on individual health has notably increased. As Yen and Syme (1999:223) elucidate, associations between neighborhood characteristics and various aspects of individual health (e.g., infant and adult mortality, activity limitations, chronic conditions, mental health, and even health behaviors) have been reported. Studies that apply multilevel analysis techniques have facilitated simultaneous considerations of neighborhood- and individual-level characteristics and their relationship to individual health, thereby isolating the effect of neighborhood characteristics above and beyond individual attributes. Many studies continue to report the deleterious effect of various negative neighborhood characteristics (collective or ecological) exhibit on individual health. For instance, low socioeconomic status (SES) neighborhoods are more likely to suffer in terms of both the quantity and quality of municipal and public health services. Further, low SES neighborhoods may have physical environments characterized by higher levels of air, water, and/or noise pollution. These two set of factors are well known predictors of deleterious individual health.

Recently, investigators have also emphasized the importance of *perceived* neighborhood characteristics on individual health. In an exploratory analysis based on neighborhoods in Glasgow City, Scotland, Sooman and Macintyre (1995) discuss how an individual's perception of his/her neighborhood affect their health, independent of objective features of the neighborhood. Employing six neighborhood perception domains (amenities, problems, crime, neighborliness, area reputation, and satisfaction), they suggest "living in what one perceives to be an unpleasant or threatening environment lacking amenities might lead to poorer health (1995:25)." A study by Chandola (2001) reports on how individual perceptions of neighborhood

safety are also significantly associated with individual's self-rated health status, net of neighborhood, household, and individual socio-economic variables. According to the author, the fear of crime might result in a lowering of community trust and a breakdown of social networks, resulting in more negative self-ratings of health through a rise in psychosocial and physical insults to the body (e.g., physical stress and mental anxiety). In a multi-level study by Ross and Mirowsky (2001), the authors investigate the relationships between neighborhood disadvantage (objective measure), and disorder (perception measure), on an individual's physical health (measured by self-reported health, physical functioning, and chronic medical conditions). The association between neighborhood disadvantage and individual health is significantly and substantially mediated by proxies of neighborhood disorder. They also conclude that neighborhood disorder (defined as fear of crime) decreases social control among residents, which results in chronic stress and health impairments. In another study, Hadley-Ives and colleagues (2000) simultaneously assess the impacts of perceived and actual neighborhood characteristics on the mental health of adolescent individuals, finding stronger influences among the former over the latter, net of related individual risk factors. Moreover, although not specifically addressing health outcomes, perceived neighborhood characteristics (particularly neighborhood safety or fear of crime) and their association to children's development (Bryant 1985), various aspects of daily life (Cook 1988), household weapon purchases (Warr 1992), and children's psychological distress and anxiety (Silverman, La Greca, and Wasserstein 1996; Shumow, Vandell and Posner 1998) are well documented. Thus, it has been suggested that how one perceives one's neighborhood is significantly and substantially associated with a variety of social and physical outcomes. In our estimation, one of the more important outcomes from this list is individual health status.

There has been concern regarding these aforementioned associations. Some researchers have posited a reverse causation hypothesis regarding neighborhood perception and individual health (e.g., Watkins, Martin, and Stern 2000; Murray, Whitehouse, and Alloy 1999). In contrast to the hypothesis that perception predicts health, some argue the possibility that chronic illness (mental or physical) might lead individuals to develop negative views and perceptions on a wide array of subjects, including neighborhood quality. For instance, a hypochondriac might not be willing to initiate or maintain contact or communication with neighbors, thereby negatively evaluating their relationship with neighbors. However, in a recent study, Latkin and Curry (2003) attempt to respond to this concern. Through a nine-month follow-up prospective study, they discover a strong association between perception of neighborhood disorder and individual symptoms of depression, even after controlling for baseline depressive conditions and selected individual characteristics.

So how do perceived neighborhood characteristics affect individual health? Several studies attempt to relate the answer of this question to the actual physical characteristics of neighborhoods (e.g., Ross and Mirowsky 2001; Hadley-Ives et al. 2000; Ross 2000). Neighborhood perceptions have been found to generally correspond with its ecological features. That is, one's negative evaluation of their neighborhood is strongly associated with any disadvantaged physical features a neighborhood may possess. Additionally, low SES neighborhoods usually exhibit high levels of social disorder, which result in a decrease of social control. Once people perceive deleterious levels of social disorder and social control, these ill features can become chronic sources of psychological stress. When fear of crime (e.g., robbery, larceny, assault, abduction, etc.) and/or unsatisfactory environments (e.g., pollution, lack of recreational facilities, etc.) exist in a neighborhood, residents might be less inclined to participate

in outdoor activities (e.g., exercise, pleasure walking, commuter walking) (Ross 1993). Given the fact that these disadvantaged neighborhood features and perceptions are more often observed among low SES individuals, individuals who already suffer from the lack of resources due to ecological processes such as residential clustering, negative perceptions can be considerable additive stressors.

Negative perceptions concerning neighbor relationships can also be a serious stressor of health. Simply put, when one does not like his/her neighbors due to relationships characterized by negative interactions, the very fact that they live in the same neighborhood might cause psychological stress to this person. Indeed, the relationship between neighbors can be understood as a dimension of social capital, since it is related to interpersonal trust, social integration, and/or social cohesion, all of which are important elements of social capital (Lochner, Kawachi, and Kennedy 1999). That is, when one perceives interpersonal neighborhood relationships as being pleasant and satisfactory, this person would be more likely to trust their neighbors and engage in community gatherings and activities. Recently, studies have suggested that social capital is a significant predictor of health within aggregated populations (Kawachi et al. 1997; Kawachi and Berkman 2000; Kawachi Kennedy, and Glass 1999) and of individuals (Sampson, Raudenbush, and Earls 1997; Rose 2000; Subramanian, Kim, and Kawachi 2002). According to Kawachi and Berkman (1997), individual health can be promoted by the quick diffusion of health-related information and salubrious behaviors and by ensuring beneficial health services and amenities through voluntarism and collective action within neighborhoods with high social capital. Thus, through these psychosocial pathways, perceptions of neighborhood quality can be a considerable risk factor of individual health and well-being.

To our knowledge, no research exists testing the relationship between perceptions of neighborhood quality and health among Koreans. Given the importance of neighborhoods and neighbors in Korean society, it may be simple to conclude that what has been observed in Western society would be also apparent in Korea. However, this may not be the case. Recently Cho (2002) analyzed the association between objective characteristics of small areas and health of adult residents in Metropolitan Seoul, South Korea. Employing multilevel analysis techniques and the 1998 Korea National Health Survey data linked to annual statistical reports from each small area (a minimal administrative boundary) in Metropolitan Seoul, the author found neither significant nor substantial effects of various measures of neighborhood characteristics (e.g., aggregated SES, levels of pollutants, public expenditure for social development, provision of physicians) on adult health as measured by self-rated health status, chronic illness status, and daily activity limitation status. In contrast, individual level demographic and SES characteristics played significant roles in predicting these health outcomes. The author attributes the lack of effects of objective small area characteristics to the short exposure duration of these contextual characteristics among residents. That is, where the duration of exposure should be considerably long for the contextual characteristics to be significantly associated to health (as discussed by Robert 1999; Waitzman and Smith 1998; Diez-Roux 2001), the exposure to contextual concepts across small areas has been relatively short in Metropolitan Seoul. Thus, based on this study, it might also be deemed that perception of neighborhood characteristics does not have any effect on individual health, just as objective neighborhood characteristics did not. Moreover, given the importance of individual-level demographic and SES characteristics in explaining variations on health in Korean society, neighborhood perception may be highly correlated with demographic

or SES characteristics as well as health. Any effect found between perceptions and health may ultimately be a data artifact.

Therefore, the specific purposes of this research are (1) to investigate if neighborhood perception is associated with the health of individual Koreans, and (2) to examine whether or not the association remains unchanged even after controls for individual characteristics known to be associated with various health outcomes. Although the main focus of our interest is the effect of perceived neighborhood characteristics, (3) we also pay attention to the role of individual characteristics in determining the health of adult Koreans, since this relationship has not been widely reported outside of Korea. We consider three individual-level neighborhood perception characteristics: neighborhood satisfaction, neighborhood safety, and satisfaction of relationship with neighbors. Since health is multidimensional, three different health measures are employed here: self-rated health status, emotional health, and daily activity limitations.

Materials and Measures

Data

We employ the Quality of Korean Life Survey (QKLS) data in the current study. The QKLS was conducted in 2001, and included a nationally representative sample of 1000 adult (20+ years of age) Koreans. Originally, these data were collected in order to examine current quality of life indicators in Korea. Since health is one of the important dimensions of quality of life, the QKLS involves various health-related questions as well as questions regarding respondent's self-assessment of various neighborhood aspects. Thus these data provides a set of relevant variables that can be readily and appropriately utilized toward our research goals.

Variables and Measures

Outcome variables

As mentioned above, three health measures are included in order to take the multidimensional aspects of health into consideration. Our first outcome variable is the self-rated health status of respondents. Poor self-rated poor health is a good predictor of mortality and disability (Idler and Benyamini 1997; Ferraro, Farmer, and Wybraniec 1997; Wilcox, Kasl, and Idler 1996). It was assessed in the QKLS by the question: "How would you describe overall state of your own health?" with an 11-point scale, 0 being very poor and 10 being excellent, as possible responses. Although this variable is continuously measured (mean: 6.70, std: 1.80), we collapse this scale to form a dichotomous outcome of self-rated health: "good" and "poor" health. The continuous distribution is considerably skewed toward high scores, with a score of 4 as a pivotal point. Thus, responses 0 to 4 and 5 to 10 are collapsed into poor and good health status, respectively. Ancillary analyses that utilized the original continuous variable (logged to offset skewness) resulted in no substantial differences in conclusions as related to the main focus of this paper.

Our second outcome variable is emotional health. This variable is constructed by summing scores on five questions addressing psychological distress. The questions are: 1) Does the respondent suffer from severe exhaustion or tiredness?, 2) Does the respondent experience symptoms of hypochondria or unhappiness?, 3) Does the respondent often feel a chill?, 4) Does the respondent often feel an anxious state of mind?, and 5) Does the respondent often feel fearful?. These questions exhibit good internal consistency (alpha = 0.73). For each question, respondents were asked to choose either yes (1) or no (0). Although the summed emotional health variable ranges from zero to five (mean: 0.44, std: 0.98), we collapse it into a dichotomous

outcome of emotional health: “good” emotional health, with zero affirmative answers, and “poor” emotional health, with one or more affirmative answers. Since majority of respondents answered “no” to all psychological distress questions (78%), and less than 10% of respondents answered affirmatively to each of the five distress questions, we feel this is a logical categorization of a seemingly rare event. As was the case in self-rated health status, ancillary analyses that utilized Poisson regression rendered results consistent with those of our presented findings.

Our last outcome variable is daily activity limitations. Since neighborhood perceptions are closely related to the psychological or mental status of individuals, it is expected that daily activity limitations, an indicator of physical health, may not be associated with how individuals perceive their neighborhood. However, as suggested above, negatively perceiving one's own neighborhood may result in daily activity limitations by preventing one from outside physical activities such as regular walking or exercising. For instance, if one thinks that their neighborhood is dangerous due to crimes, this person might reduce their time outside, or no place exists to exercise or walk for pleasure in the neighborhood (e.g., parks), minimal physical activities that are crucial to maintaining one's health may be negatively affected. Insufficient physical activity may result in daily activity limitations. This health outcome is assessed in the QKLS by asking, "Are your daily activities limited by chronic conditions, illnesses, or disabilities?" Although there are three response categories (severely limited, moderately limited, and not limited), we combine the responses “severely limited” and “moderately limited”, since the proportion of responses for “severely limited” is considerably low (2.4%). Thus, daily activity limitation status is dichotomously utilized here: not limited, and limited.

Independent Variables

Variables of main interest in this study include three neighborhood characteristics perceived by individuals: overall neighborhood satisfaction, neighborhood safety, and satisfaction of relationship with neighbors. They are assessed in the QKLS by asking, "How much are you satisfied with your neighborhood?", "How much are you satisfied with neighborhood security?", and "How much are you satisfied with your relationship to your neighbors?", respectively. Each question includes an 11-point scale: from 0 being totally unsatisfied to 10 being totally satisfied. Although it is true that overall neighborhood satisfaction is inclusive of fear of crime and relationship to neighbors, the correlation coefficients are 0.56 and 0.45, indicating that they do not measure the same aspect of perceived neighborhood features.

The associations of interest are adjusted by various individual demographic and SES characteristics, e.g., age, sex, marital status, residence (rural/small to medium size city/large city), family income, and educational attainment. Each variable has been demonstrated to significantly impact individual health or to be useful as a control when estimating the effects of other variables on health. As evident in the tables that follow, measurements of the control variables are conventional and straightforward. For family income, we include a category for missing values to offset the reduction in viable cases due to missing data on family income (18.6%).

Findings

Descriptive Analysis

Table 1 documents the unadjusted patterns of association between each health measure and perceived neighborhood characteristics as well as demographic and SES characteristics of adult Koreans. Perceptions of three neighborhood characteristics included in this study are

positively associated with good self-rated health status, no reported distress symptom, and no daily activity limitation among Koreans, and this pattern is more pronounced in the case of self-rated health status. In other words, the more individuals are satisfied with neighborhood quality, the better their health as measured by three different health indicators in Korea. Of interest is daily activity limitation status in that, despite being an indicator of physical conditions, it is slightly related with how individuals perceive their neighborhoods, a psychological condition. In terms of the individuals' demographic and SES characteristics, all three health indicators are consistently associated in the generally expected directions based on previous studies. Being female, older, divorced/separated/widowed, a rural resident, low educated, and of low family income are considerably related with an elevated risk of poor self-rated health, poor emotional health, and daily activity limitations among Koreans. Note that since findings from Table 1 are unadjusted, interpretations on the relationships between independent variables and each health indicator are tenuous, pending results from our multivariate models.

-- Table 1 about here --

Multivariate Analysis

Self-rated health status

Table 2 presents parameter estimate results of logistic regression analyses for the effect of perceived neighborhood characteristics along with demographic and SES characteristics on self-rated health status among adult Koreans. All models in this table are adjusted for age and sex, and the coefficients indicate the risk of poor self-rated health status. Models 1 through 3 contain each of the three perceived neighborhood characteristics as well as respondent age and sex. Consistent with our descriptive findings, neighborhood satisfaction, neighborhood safety, and satisfaction of relationship with neighbors, are negatively associated with the risk of poor

self-rated health status, net of age and sex. When all three perceived neighborhood characteristics are simultaneously considered (Model 4), the effect of neighborhood satisfaction disappears, while the effects of the other two perceived neighborhood features remain significant and substantial, despite their slightly decreased values, compared to previous models. This indicates that the effect of neighborhood satisfaction, with regard to self-rated health status, is mainly attributable to how people perceive the safety of their neighborhood and the level of satisfaction with their relationship to their neighbors. In Model 5, we add demographic characteristics of individuals (marital status and residence by size of city). These additional variables do not significantly contribute in explaining the risk of poor self-rated health status, although the patterns are consistent with those observed in the descriptive analyses. Accordingly, coefficients of other variables in the model remain almost unchanged from the previous model.

-- Table 2 about here --

When SES variables are included and demographic variables are omitted in Model 6, the effects of three perceived neighborhood characteristics remain almost unchanged compared to those in Model 4, in terms of their significance and magnitude. As far as the effect of family income is considered in this model, individuals of low family income are at a substantially high risk of poor self-rated health status than their counterparts of high family income (odds ratio: 4.22, not shown in table). Respondents whose family income information is missing are also exposed to a higher risk of negative self-assessment of health. The effect of educational attainment in this model requires special attention. The coefficient indicates that adult Koreans with only a high school diploma are significantly less likely to assess their own health as poor than their college-educated counterparts (odds ratio: 0.50, not shown in table). Additionally, this pattern remains unchanged in subsequent and more saturated models. This is puzzling and

inconsistent with the general relationship between health and education. We defer our explanation until the analyses for three outcome variables are completed. In Model 7, both demographic and SES risk factors are simultaneously considered along with perceived neighborhood risk factors. The coefficient of each perceived neighborhood risk factor is almost identical with those in the previous models, in terms of significance and direction. In this model, almost no change in the model deviance is seen, compared to that of Model 6 (Chi-square: 1.06, df: 4), which indicates the relative importance of SES risk factors over demographic ones in predicting self-rated health status among Korean. Although still not significant, substantial reductions in the magnitude of demographic characteristics are seen from Model 5 to Model 7. This indicates the SES disadvantage among individuals not currently married or not residing in large cities, relative to currently married and large city residents. Since it is expected that mentally or physically ill individuals are more likely to assess their health as poor, we add our two other health indicator outcome variables in Model 8 as a way of taking into account some measure of baseline health status. However, even controlling for these indicators does not change or eliminate the protective effects of perceived satisfaction concerning neighborhood safety and quality of neighbor relationships on self-rated health status among Koreans. No other considerable changes are found among the effects of individual characteristics, except for individuals of very low education (less than high school). A change of direction from positive to negative for this coefficient, despite not being significant, indicates their disadvantaged baseline health status. Certainly, individuals with daily activity limitations and emotional health conditions are substantially more likely to report their own health status as poor. Overall, findings from this table suggest that, among the three perceived neighborhood characteristics, neighborhood safety and satisfaction of relationship with neighbors have significant effects on

the risk of negative self-rated health status among Koreans. This effect exists over and above an individual's demographic and SES characteristics as well as baseline physical and emotional health status.

Emotional Health

Table 3 presents an analogous set of models focusing on predicting poor emotional health utilizing logistic regression and resulting parameter estimates. We omit the model that controls for baseline health status, since we emotional health is the outcome variable here. As described above, we treat individuals who respond as experiencing at least one psychological distress symptom out of five as having poor emotional health. Models 1 through 3 illustrate that each perceived neighborhood characteristic considered in this study has a significant and negative effect on emotional health among Koreans, net of age and sex. However, when all three perceived neighborhood characteristics are considered simultaneously in Model 4, only the effect of satisfaction of relationship with neighbors remains substantial and significant, while the effects neighborhood satisfaction and neighborhood safety reduced to near zero and become non-significant. This suggests that the protective effects of neighborhood satisfaction and neighborhood safety, observed in Models 1 and 2, are indeed mediated by the effect of satisfaction on relationship with neighbors. In Model 5 where marital status and residence by size of city are controlled, the pattern of association between perceived neighborhood characteristics and emotional health remains virtually unchanged. This model does show that adult Koreans who are divorced/separated/widowed are at greater risk of poor emotional health than their currently married counterparts (odds ratio: 2.4, not shown in table), net of other risk factors. Although not significant, size of residential area is negatively associated with the odds of poor emotional health. In Model 6, omitting demographic characteristics and only

considering SES risk factors does not modify the effect of satisfaction of relationship with neighbors. The effects of the other two perceived neighborhood characteristics remain small and not significant. This model also indicates that individuals who have low family income or whose income information is missing are at a greater risk of poor emotional health as compared to respondents with high family income. Of interest is the effect of educational attainment. As observed in the case of self-rated health status (Table 2), the effect of adult Koreans who terminated schooling after high school is negative, indicating they are less likely to report at least one psychological distress symptom than their college attending/attended counterparts, although not statistically significant. Again, this is puzzling and not consistent with the general expectations. Our explanation on this will be discussed after all three health outcome variables have been analyzed. Model 7 includes all individual and perceived neighborhood risk factors. The effect of satisfaction of relationship with neighbors remains almost unchanged. The relative disadvantage of divorced/separated/widowed Koreans or of residence in smaller size/rural places observed in Model 5 disappears in this model, indicating that it is mainly attributable to their disadvantaged SES characteristics. Direction and magnitude of association between educational attainment and family income remained almost unchanged, even though the coefficient for low family income loses statistical significance. Individuals who are missing data on of family income are significantly more likely to report poor emotional health. Overall, among the three perceived neighborhood characteristics included in this analysis, only the extent to which individuals are satisfied with their relationships to neighbors has a significant effect on the emotional health of Koreans, above and beyond the effects of more traditional individual risk factors.

-- Table 3 about here --

Daily Activity Limitations

Table 4 displays analyses focusing on the prediction of daily activity limitation status. Table represent logistic regression parameter estimates predicting limitations in daily activities regardless of severity. When each of three perceived neighborhood characteristics is considered respectively in baseline models (Models 1 through 3), controlling for age and sex, neighborhood safety is the only risk factor significantly associated with a decreased probability of daily activity limitations. Unlike the previous two tables, where males showed advantages in both health indicators, over females, the current coefficient is not significant and its magnitude is small. This relationship remains constant in subsequent models. Simultaneous consideration of the three perceived neighborhood characteristics, along with age and sex in Model 4, also result in a similar relationship, where only perceived neighborhood safety has a significantly negative effect, albeit small in magnitude. Additional controls for marital status and residence by size of city in Model 5 result in no considerable change in the effects of perceived neighborhood characteristics. This model shows that individuals living in small to medium size urban areas are at significantly greater risk of daily activity limitations than are their large-city residing counterparts. Although the coefficient for rural town residents is not significant in the model, it is quite possible that a larger sample of rural respondents would have increased the significance level (p-value: 0.07, not shown in the table). Omitting demographic variables in lieu of SES risk factors in Model 6 results in the loss of significance of the effect of perceived neighborhood safety on daily activity limitations. This suggests that the relationship between respondent perceptions of neighborhood safety and daily activity limitations is spurious, which is conditioned by SES characteristics. Family income is inversely associated with the probability of daily activity limitations. Of

interest is the effect of educational attainment, and particularly that of high school graduates. Although not significant and of small magnitude, this effect is positive, an opposite result to the previous two health indicators, where the coefficients of the same category were negative. The positive sign of the coefficient for high school graduate remains unchanged in the full model. Our explanation for this effect is explored in the subsequent discussion section. In Model 7, all variables are included, resulting in no significant effects among the perceived neighborhood characteristics. This may also indicate the prominent role of individual SES in predicting the risk of daily activity limitations among adult Koreans. Decreased coefficient values for marital status and residence by size of city suggests, compared to Model 5, that individuals from the reference categories of each risk factor are socioeconomically advantaged over their comparison categories. Overall, the extent to which individuals perceive the safety of their neighborhood seems to be negatively associated with their risk of daily activity limitations, but this effect disappears when individual SES risk factors are considered.

-- Table 4 about here --

Discussion

We have attempted to address three main issues in this study. The first includes an analysis of the association between perceived neighborhood characteristics and the health of adult Koreans. The second involves analyses to test if this association is mediated by individual-level demographic and SES characteristics. The third is to explore the effects and importance of individual demographic and SES risk factors on three different health outcomes among adult Koreans. It appears from the descriptive analyses that negative perceptions of neighborhood quality were associated with the poorer health among adult Koreans. Although this was more pronounced in the case of self-rated health status, the same pattern of association was found in

the other two health indicators studied. Moreover, all three variables of perceived neighborhood characteristics seemed to have some measurable effect on Korean adult health, despite the variation in the strength of the association. Based only on the findings from the descriptive analysis, it seems that how people perceive their neighborhood may contribute to the health status of Koreans, regardless of how health is measured.

However, when the relationship between each health outcome and perceived neighborhood characteristics was adjusted for individual demographic and SES risk factors in multivariate analyses, the patterns of association turned out to be somewhat more complex. While individual's satisfaction with both neighborhood safety and their relationships to neighbors still had significant influence on how they self-assess their global health status, only the satisfaction on relationship with neighbors showed significant and substantial effect on their emotional health. Moreover, none of the perceived neighborhood characteristics involved in this study were associated with daily activity limitation status among Koreans, net of individual risk factors. To disentangle this complexity, it is useful to note that we conceptualized self-rated health status and emotional health as more subjective measures and/or psychological aspects of health, as opposed to daily activity limitations, which represent physical and/or more objective health indicators. Given this, we can extrapolate that how adult Koreans perceive their neighborhood should, *to some extent*, only significantly affect their psychological or subjective health. In particular, individual's satisfaction on the relationship with their neighbors exerts important effects on their subjective rating of health status and on psychological distress status, reinforcing the importance of social ties and interpersonal relationships among neighbors in Korean society. Of interest is the non-significant effect of perceived neighborhood safety on emotional conditions (Table 3), which is somewhat inconsistent with previous studies that

document the fear of neighborhood crime as an important predictor of mental health outcomes in Western society (e.g., Roberts 1998; Ellaway and Macintyre 1998; and Middleton 1998). It is unsurprising that none of the perceived neighborhood characteristics, which are closely related with psychological or cognitive processes, play a significant role in shaping variations in physical health among Koreans, as previously expected.

Regarding the second aim of this paper, our multivariate analyses have evidenced that the effect of perceived neighborhood features on self-rated health and emotional health continue to exist above and beyond individual demographic and SES risk factors. Even the changes in significance and magnitude of coefficients for perceived neighborhood features across models in Table 2 and Table 3 were induced not by the inclusion of individual level risk factors but by the simultaneous consideration of all three neighborhood risk factors, which suggests the independence of the effect of perceived neighborhood characteristics from the effect of individual characteristics, with respect to two health outcome variables of interest. On the other hand, in the case of physical health of Koreans, as measured by daily activity limitations, the effect of neighborhood safety became non-significant when individual SES risk factors were considered, indicating a stronger effect of individual SES on predicting physical health status among Koreans than the effect of any perceived neighborhood characteristics. In sum, we conclude that adult Koreans who are satisfied with their neighborhood safety and interpersonal relationships with neighbors are more likely to enjoy better subjective or emotional health than their counterparts with a lower level of satisfaction, regardless of the social attributes of individuals. However, how people perceive their neighborhood quality does not have any influence on their physical health outcomes, while demographic and SES characteristics of each individual play a prominent role.

It seems that our overall finding that neighborhood characteristics partly explains the health of individual Koreans, even though limited only to subjective and/or emotional health, contradict the previous findings of Cho (2002). As already stated, this study, one of the few attempts to investigate the relationship between objective neighborhood characteristics and individual health in Korea, resulted in neither significant nor substantial effects of neighborhood characteristics on health. Particularly, no effect was found between objectively measured neighborhood characteristics and self-rated health status, after controlling for individual demographic and SES risk factors. This is comparable to what has been observed through the analysis of this paper on self-rated health status. Based on this, it seems that we might want to conclude that perceived neighborhood characteristics are a more important risk factor than are objective or contextual neighborhood characteristics. However, results of these two studies should not be directly compared, since different aspects of neighborhood features were analyzed within the two studies. That is, it would have been possible to make a direct comparison if individual perceptions on the variables objectively measured in Cho (2002) were included in the current study. For example, if information on individual's satisfaction on neighborhood accessibility to physicians were available in this study, a direct comparison would have been possible between these two study findings. Accordingly, we do not have enough evidence yet to conclude the relative importance of perceived neighborhood quality as compared to the objective features with regard to their impacts on health of Koreans. Again, short exposure to objective measures of neighborhood characteristics may have been the key factor that limited the ability of Cho to uncover a statistically significant relationship between contextual-level neighborhood characteristics and individual health outcomes.

The last aim of this paper involves the relationship between individual risk factors and health outcomes. As already mentioned, surprisingly few studies have been undertaken outside of Korean research institutions: studies that examine the current patterns of association between social risk factors and the health of Koreans. Compared to the effect of perceived neighborhood characteristics, most individual demographic and SES risk factors have shown much greater influence on the health of Koreans, and overall patterns of association are not much different from the general findings based mostly on Western societies. For instance, age is a strong predictor of health conditions, with marital status also partly explaining the risk of adverse health conditions. It appears that women are more vulnerable than men to psychological or emotional conditions, while no differences in the odds of daily activity limitations are found, consistent with the well-known hypothesis that women are more susceptible to adverse psychological symptoms than men due to differences in social role expectations (Verbrugge 1989). Further, Koreans with low family income are at a substantially higher risk of both physical and emotional health problems. Of interest is the effect of educational attainment. Among Koreans, it is a well-known fact that education is one of the most important elements of their lives. They tend to invest greatly on their quality and quantity of education, as well as that of their children. Accordingly, the level of education that one achieves is a crucial determinant of various aspects of Korean life, including their quality of life and health. Given this, it is easy to expect that educational attainment would be negatively associated with the increased probability of health problems. Indeed, this pattern was observable in this study for daily activity limitation status. However, for the cases of self-rated and emotional health, our results showed an opposite pattern, where by people with only a high school diploma were less likely to be disadvantaged than their college attended/attending counterparts, with the least educated respondents being most

disadvantaged, an expected finding. This may suggests that Koreans with a higher level of education (college or more) are actually more likely to suffer from psychological conditions and in turn assess their health negatively, compared to their high school graduated counterparts, possibly due to frequent and substantial exposure to mental stresses attached to their occupations. However, it can also be understood as a tendency of somatization among those with a college education. They may, in fact, be in good health but just tend to believe that they have health problems. This finding is due to the possibility that more education includes an increase in knowledge and information on health and illness with an accompanying increase of health concerns. Indeed, we argue the second explanation to be more plausible, since our analysis on self-rated health status showed that Koreans with college education were still more likely to assess their health negatively than high school graduates, even after controls for baseline emotional and physical health status (Table 2, Model 8).

Our study is limited at least in the following two ways. First, we have documented the effect of perceived neighborhood characteristics on individual health throughout this paper. Even though we introduced a recent study by Latkin and Curry (2003), a study that empirically investigated the directional relationship between perceived neighborhood disorder and depression, the reciprocal effect of perceived neighborhood quality and health (particularly subjective and/or psychological health) may actually exist in Korean society. Particularly, individuals with depressive symptoms or mental health problems may encounter difficulties in making and maintaining a good relationship with neighbors due to self-selection and social rejection (Johnson 1991). Unfortunately, there have not been data sets that can be utilized for the investigation of social causality between social risk factors, including perception of neighborhood quality, and individual health in Korea (e.g., longitudinal data). Second, we have

considered perceived neighborhood characteristics only, with respect to their impact on individual health. It would have been more comprehensive to investigate the impact of neighborhood quality on individual health, if both objectively measured contextual features of neighborhood and subjectively measured perceptions of them were simultaneously analyzed. By doing this, it would be possible to investigate whether or not the effect of contextual characteristics on individual health exist, and, if any, to reveal if this is mediated by the subjectively perceived neighborhood characteristics, as observed in contemporary US society (e.g., Ross and Mirrowsky 2001). We were not able to address and examine such issues here due to data limitations. Future research should pay more attention to analyzing the social causality of health in Korean society. Recently, serious concerns have risen regarding residential clustering by socioeconomic groups in Korea (Yoon 1998). When this phenomenon becomes more apparent and pronounced, the objective and subjective features of neighborhood will be of greater importance with respect to their influence on the quality of life, including health, among individual Koreans. Although this article is subject to the above and other limitations, the findings of this study on the relationship between perceived neighborhood characteristics and several health outcomes in Korea, relationships which have rarely been examined, should increase national and international discourse on this important topic.

References

Bryant, B. 1985. *The neighborhood walk*. Monographs of the society for research in child development. Chicago: University of Chicago Press.

Chandola, Tarani. 2001. "The fear of crime and area differences in health." *Health and Place* 7:105-116.

Cho, Youngtae. 2002. *The impact of individual- and contextual-level characteristics on the health of Metropolitan Seoul adult residents*. Unpublished Doctoral Dissertation. The University of Texas - Austin.

Cook, C. 1988. "Components of neighborhood satisfaction: responses from urban and suburban single-parent women." *Environment and Behavior* 20:115-149.

Diez-Roux, Ana V. 2001. "Investigating neighborhood and area effects on health." *American Journal of Public Health* 91:1783-1789.

Ellaway, Anne, Sally Macintyre. 1998. "Does housing tenure predict health in UK because it exposes people to different levels of housing related hazards in the home or its surroundings?" *Health and Place* 4:141-150.

Ferraro, Kenneth F., Melissa M. Farmer, and John A. Wybraniec 1997. "Health trajectories: long-term dynamics among black and white adults." Journal of Health and Social Behavior 38:38-54.

Hadley-Ives, Eric, Arlene Rubin Stiffman, Diane Elze, Sharon D. Johnson, and Peter Dore. 2000. "Measuring neighborhood and school environments: perceptual and aggregate approaches." *Journal of Human Behavior in the Social Environment* 3:1-27.

Idler, Ellen L., and Yael Benyamini. 1997. "Self-rated health and mortality: a review of twenty-seven community studies." *Journal of Health and Social Behavior* 38:21-37.

Johnson, Timothy P. 1991. "Mental Health, Social Relations, and Social Selection: A Longitudinal Analysis." *Journal of Health and Social Behavior* 32:408-423.

Kawachi, Ichiro, and Lisa F. Berkman. 1997. "Health and social cohesion: why care about income inequality?" *British Medical Journal* 314:1037-1040.

Kawachi, Ichiro, and Lisa F. Berkman. 2000. "Social cohesion, social capital, and health." in Lisa F. Berkman and Ichiro Kawachi (eds.) *Social Epidemiology*. New York: Oxford University Press.

Kawachi, Ichiro, Bruce P. Kennedy, and Roberta Glass. 1999. "Social capital and self-rated health: a contextual analysis." *American Journal of Public Health* 89:1187-1193.

Kawachi, Ichiro, Bruce P. Kennedy, Kimberly Lochner, and D. Prothrow-Smith. 1997. "Social capital, income inequality, and mortality." American Journal of Public Health 87:1491-1498.

Latkin Carl A., and Aaron D. Curry. 2003. "Stressful neighborhoods and depression: a prospective study of the impact of neighborhood disorder." *Journal of Health and Social Behavior* 44:34-44.

Lochner, Kimberly, Ichiro Kawachi, and Bruce P. Kennedy. 1999. "Social capital: a guide to its measurement." *Health and Place* 5:259-270.

Middleton, John. 1998. "Crime is a public health problem." *Medicine, Conflict and Survival* 14:24-28.

Murray, Laura A., Wayne G. Whitehouse, and Lauren B. Alloy. 1999. "Mood congruence and depressive deficits in memory: a forced-recall analysis." *Memory* 7:175-196.

Robert, Stephanie A. 1998. "Community-level socioeconomic effects on adult health." *Journal of Health and Social Behavior* 39:18-37.

Robert, Stephanie A. 1999. "Socioeconomic position and health: the independent contribution of community socioeconomic context." *Annual Review of Sociology* 25:489-516.

Ross, Catherine E. 1993. "Fear of victimization and health." *Journal of Quantitative Criminology* 9:159-175.

Ross, Catherine E. 2000. "Neighborhood disadvantage and adult depression." *Journal of Health and Social Behavior* 41:177-87.

Ross, Catherine E., and John Mirowsky. 2001. "Neighborhood disadvantage, disorder, and health." *Journal of Health and Social Behavior* 42:258-276.

Ross, Richard. 2000. "How much does social capital add to individual health? A survey study of Russians." *Social Science and Medicine* 51:1421-1435.

Sampson, R. J., S. W. Raudenbush, and F. Earls. 1997. "Neighborhoods and violent crime: a multilevlel study of collective efficacy." *Science* 277:918-924.

Shumow, Lee, Deborah Lowe Vandell, and Jill Posner. 1998. "Perceptions of danger: a psychological mediator of neighborhood demographic characteristics." *American Journal of Orthopsychiatry* 68:468-478.

Silverman, Wendy K., Annette M. La Greca, and Shari Wasserstein. 1996. "What do children worry about? Worries and their relation to anxiety." *Child Development* 66:671-686.

Sooman, Anne, and Sally Macintyre. 1995. "Health and perceptions of the local environment in socially contrasting neighbourhoods in Glasgow." *Health and Place* 1:15-26.

Subramanian, S. V., Daniel J. Kim, and Ichiro Kawachi. 2002. "Social trust and self-rated health in US communities: a multilevel analysis." Journal of Urban Health 79:S21-S34.

Verbrugge, Lois M. 1989. "The Twain Meet: Empirical Explanations of Sex Differences in Health and Mortality." *Journal of Health and Social Behavior* 30:282-304.

Waitzman, Norman J., and Ken R. Smith. 1998. "Phantom of the area: poverty-area residence and mortality in the United States." *American Journal of Public Health* 88:973-976.

Warr, M. 1992. "Altruistic fear of victimization in households." Social Sciences Research Quarterly 73:723-736.

Watkin, Philip C., Corby K. Martin, and Leonard D. Stern. 2000. "Unconscious memory bias in depression: perceptual and conceptual processes." *Journal of Abnormal Psychology* 109:282-289.

Wilcox, V. L., Stanislav V. Kasl, and Ellen L. Idler. 1996. "Self-rated health and physical disability in elderly survivors of a major medical event." *Journal of Gerontology: Social Science* 51B:S96-S104.

Yen, I. H., and S. L. Syme. 1999. "The social environment and health: a discussion of the epidemiologic literature." *Annual review of Public Health* 20:287-308.

Yoon, In-jin. 1998. "Seoul-shi ei Sa-hoi-Gae-cheng-byol Geo-ju-ji Bun-wha-hyong-tae-wa Sa-hoi-joek Ham-ei (Patterns of Residential Clustering by Socioeconomic Status in Seoul and Their Social Implication." *Seoul Studies Journal* 10:229-270.

Table 1. Distributions of perceived neighborhood characteristics and demographic and socioeconomic status characteristics of adult (20-year old and +) Koreans, by indicators of health status.

	Self-rated health status		Emotional health		Daily activity limitation		Total
Characteristics	Poor	Good	Poor	Good	Yes	No	
Neighborhood perception (mean)							
Neighborhood satisfaction	5.7	6.5	6.2	6.5	6.3	6.5	
Neighborhood safety	5.3	6.5	6.1	6.5	6.0	6.5	
Satisfaction of relationship with neighbors	5.8	6.4	6.2	6.4	6.3	6.4	
Sex (%)							
Male	6.9	93.1	18.5	81.5	14.9	85.1	491.0
Female	11.6	88.4	25.7	74.3	16.5	83.5	509.0
Age (mean, years)	47.2	38.9	44.6	38.3	46.8	38.3	
Marital Status (%)							
Never married	3.5	96.5	10.0	90.0	7.5	92.5	200.0
Married	9.9	90.1	24.3	75.7	16.4	83.6	775.0
Divorced/separated/widowed	36.0	64.0	56.0	44.0	60.0	40.0	25.0
Residence by size of city (%)							
Large city	7.6	92.4	20.2	79.8	11.7	88.3	486.0
Small to medium size city	10.0	90.0	22.5	77.5	18.7	81.3	391.0
Rural towns	13.8	86.2	29.3	70.7	22.0	78.1	123.0
Educational attainment (%)							
Less than high school	26.0	74.1	46.2	53.8	40.5	59.5	158.0
High school graduate	6.2	93.8	18.2	81.8	13.0	87.0	484.0
College or more	6.2	93.9	17.0	83.0	8.4	91.6	358.0
Family income (%)							
Low	17.6	82.4	31.0	69.0	26.9	73.2	216.0
Middle	6.3	93.7	18.7	81.3	12.2	87.9	395.0
High	3.0	97.0	15.8	84.2	8.4	91.6	203.0
Missing	12.9	87.1	26.3	73.7	18.3	81.7	186.0
All persons (no.)	93	907	222	778	157	843	1000

Source: Quality of Korean Life Survey, 2001.

Note: Except for rounding error, percentages sum to 100.0%.

Table 2. The effect of perceived neighborhood characteristics and individual demographic and socioeconomic status characteristics on "Poor" self-rated health status for adult (20-year old and +) Koreans.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Perceived Neighborhood								
Neighborhood satisfaction	-0.31**			-0.09	-0.08	-0.09	-0.08	-0.09
Neighborhood safety		-0.38**		-0.28**	-0.27**	-0.24**	-0.25**	-0.29**
Satisfaction of relationship with neighbors			-0.39**	-0.22*	-0.24**	-0.27**	-0.28**	-0.24*
Individual Characteristics								
Age (mean, years)	0.07**	0.07**	0.07**	0.07**	0.07**	0.06**	0.05**	0.04*
Sex [Female]								
Male	-0.59*	-0.62**	-0.68**	-0.70**	-0.68**	-0.75**	-0.72**	-0.60*
Marital Status [Married]								
Never married					0.03		-0.31	-0.12
Divorced/separated/widowed					0.83		0.29	-0.22
Residence by size of city [Large City]								
Small to medium size city					0.29		0.10	-0.12
Rural towns					0.59		0.22	0.07
Educational attainment [College or more]								
Less than high school						0.42	0.39	-0.15
High school graduate						-0.69*	-0.69*	-0.74*
Family income [High]								
Low						1.41**	1.34**	1.14*
Middle						0.77	0.73	0.73
Missing						1.45**	1.41**	1.08*
Daily Activity Limitation [No]								
Yes								1.39**
Emotional Health Condition [No]								
Yes								2.20**
Intercept	-3.03**	-2.69**	-2.83**	-1.54*	-1.55	-1.66	-1.37	-1.83
-2LL	545.34	531.46	542.56	521.02	514.78	486.71	485.65	368.80

* p<0.05; **<0.01.

Reference category for self-rated health status is Good. See text for more information.

All other reference categories are in parentheses.

For all models, n=1000.

Source: Quality of Korean Life Survey.

Table 3. The effect of perceived neighborhood characteristics and individual demographic and socioeconomic status characteristics on emotional health conditions for adult (20-year old and +) Koreans.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Perceived Neighborhood							
Neighborhood satisfaction	-0.12**			-0.04	-0.04	-0.04	-0.03
Neighborhood safety		-0.12**		-0.05	-0.05	-0.03	-0.03
Satisfaction of relationship with neighbors			-0.18**	-0.14*	-0.15*	-0.17**	-0.18**
Individual Characteristics							
Age (mean, years)	0.05**	0.05**	0.05**	0.05**	0.04**	0.04**	0.03**
Sex [Female]							
Male	-0.42**	-0.42**	-0.46**	-0.46**	-0.41*	-0.44**	-0.39*
Marital Status [Married]							
Never married					-0.29		-0.50
Divorced/separated/widowed					0.87*		0.44
Residence by size of city [Large City]							
Small to medium size city					0.15		0.06
Rural towns					0.41		0.21
Educational attainment [College or more]							
Less than high school						0.55	0.53
High school graduate						-0.33	-0.35
Family income [High]							
Low						0.56*	0.49
Middle						0.22	0.18
Missing						0.63*	0.60*
Intercept	-2.34**	-2.36**	-2.08**	-1.76**	-1.49**	-1.60**	-1.09
-2LL	992.60	992.78	987.75	985.52	977.69	959.50	953.26

* p<0.05; **<0.01.

Reference category for emotional health condition is No Distress Symptom. See text for more information.

All other reference categories are in parentheses.

For all models, n=1000.

Source: Quality of Korean Life Survey.

Table 4. The effect of perceived neighborhood characteristics and individual demographic and socioeconomic status characteristics on daily activity limitations for adult (20-year old and +) Koreans.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Perceived Neighborhood							
Neighborhood satisfaction	-0.08			0.01	0.01	0.03	0.02
Neighborhood safety		-0.15**		-0.14*	-0.13*	-0.10	-0.10
Satisfaction of relationship with neighbors			-0.11	-0.05	-0.05	-0.09	-0.08
Individual Characteristics							
Age (mean, years)	0.07**	0.07**	0.07**	0.07**	0.07**	0.05**	0.05**
Sex [Female]							
Male	-0.09	-0.10	-0.12	-0.11	-0.08	-0.00	0.03
Marital Status [Married]							
Never married					0.36		0.19
Divorced/separated/widowed					1.41**		1.00*
Residence by size of city [Large City]							
Small to medium size city					0.54**		0.46*
Rural towns					0.51		0.20
Educational attainment [College or more]							
Less than high school						1.00**	0.98**
High school graduate						0.09	0.17
Family income [High]							
Low						0.96**	0.82*
Middle						0.38	0.35
Missing						0.83*	0.69*
Intercept	-4.02**	-3.61**	-3.91**	-3.48**	-3.92**	-3.54**	-3.85**
-2LL	739.69	795.97	792.77	799.46	786.25	774.59	741.89

* p<0.05; **<0.01.

Reference category for daily activity limitations is None. See text for more information.

All other reference categories are in parentheses.

For all models, n=1000.

Source: Quality of Korean Life Survey.