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Neighborhood Environments and Depression: A Longitudinal Study

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NEIGHBORHOOD ENVIRONMENTS AND DEPRESSION: A LONGITUDINAL STUDY

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ABSTRACT

Does a neighborhood affect individuals' depression levels? Despite a large amount of research suggesting the importance of neighborhood for mental health, there is a lack of longitudinal studies specifying the temporal association between them. The current study makes use of three waves of the American's Changing Lives (House, 1986a) dataset to examine the effect of neighborhood quality on depression across time and to investigate if social support buffers this effect. Particularly, the current study uses the interviewers' ratings of neighborhoods, along with the respondents' ratings to assess neighborhood effects more objectively. Besides examining people who did not move across all three waves, the current study also looks at respondents who had changed their residences during this time period and explores the interaction between moving and changes in the respondents' ratings of their neighborhoods. Results indicate that being more dissatisfied with the new neighborhood is associated with an increase in depression for people who changed their residences and that the effect of the interviewers' ratings of neighborhoods on depression can be attenuated by individual differences.

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CHAPTER ONE

BACKGROUND AND LITERATURE REVIEW

Introduction

An essential tenet of mental health sociology is that social conditions are fundamental causes of major diseases because social conditions determine which groups of people are at risk and determine access to coping resources such as social support (Link & Phelan, 1995). It has been argued by previous researchers that ecological factors, especially residential areas, are among the most important ones that independently affect individuals' mental health (Yen & Syme, 1999). Particularly, living in a poor neighborhood increases exposure to chronic stressors, which plays a substantial role in determining one's depressive symptoms (Turner, Wheaton, & Lloyd, 1995). Neighborhood conditions have been linked to mental health in the general population (Ross, 2000), as well as specifically among adolescents (Aneshensel & Sucoff, 1996), and African American women (Cutrona et al., 2005). These studies posit that a poor neighborhood can be stressful, helping to explain why people living in advantaged neighborhoods usually have better mental health whereas degraded mental health often co-occurs with being exposed to an undesirable environment.

Although the mental health significance of neighborhoods has been well identified, there are several limitations to previous studies. First, few studies have looked at the above association longitudinally, so there is a lack of evidence showing that the neighborhood effect accounts for changes in an individual's mental health status across time. Another criticism is that current strategies used to assess neighborhood effects do

not measure neighborhoods in a valid way. Most studies use census tracts as proxies for neighborhoods but the difference between geographic and real boundaries of the neighborhood make it less valid to use census tracts (Sampson, Morenoff, & Gannon-Rowley, 2002). Some studies have demonstrated that residents who rate their neighborhoods negatively tend to report more and higher levels of mental illnesses. These studies, however, have overlooked the difference between self-reported perceptions and actual conditions of the neighborhood. Therefore, the current study both examines neighborhood effects on depression longitudinally and seeks to propose an alternative measure of the neighborhood to address issues raised by these limitations.

Defining Neighborhood

Before reviewing the literature on neighborhoods and mental health, it is necessary to clarify the definition of neighborhood and the theoretical approach that the current study is going to take. Neighborhoods, as defined by Downs and Stea (1973), refer to the surroundings that people observe, interpret, and construct as "cognitive maps" (pp. 8) that guide their relationships to space, their choices of movement, and their approaches to social interaction.

There are two possible ways to study neighborhoods—compositional and contextual. The compositional perspective is based on the belief that poor people experience the same poor health condition wherever they live and that disadvantaged neighborhoods are characterized by these people living together (Macintyre & Ellaway, 2003). In contrast, the contextual perspective argues that the place itself has an

independent impact on its' residents' health status regardless of their individual characteristics (Macintyre & Ellaway, 2003). According to the contextual perspective, the health status of poor or affluent people will vary, depending on the neighborhood they live in and not simply their differences in personal advantage.

Research has produced evidence suggesting that the neighborhood effect is not derived only from its composition—whether people living in this neighborhood are rich or poor. The composition of the neighborhood, measured by aggregate-level characteristics of individuals, does not fully explain neighborhood variations because the ability to establish shared values and social control varies across neighborhoods (Sampson, Raudenbush, & Earls, 1997). For example, neighborhoods have effects on individuals that are distinct from the influence of other ecological structures. Neighborhoods are nested within larger ecological structures and are shaped by higher-level factors such as the macro-economy (Sampson et al., 2002). However, changes in larger structures do not act equally on different neighborhoods. It is usually easier for poor neighborhoods to experience a rapid increase in disorder, even if there is only a small increase in the general poverty level of the whole society (Massey, 1990). It is in the neighborhood that residents directly experience those changes generated by larger ecological structures. For these reasons, the current study will use measures of the neighborhood that are more consistent with the contextual perspective and will assess whether neighborhood context as a whole influences individuals' depressive symptoms net of their socio-economic status (SES).

Neighborhood and Mental Health

The Neighborhood as a Stressor

Neighborhoods can be linked to psychological distress through the stress process. A stressor, defined by Wheaton (1999) is "a condition of threat, demand, or structural constraint that, by its very occurrence or existence, calls into question the operating integrity of the organism" (pp. 281). For example, one can feel threatened by the risk of being fired. The anxiety that arises from this stressor can cause the individual to evaluate himself or herself as useless or let him or her feel hopeless. Based on the stress-appraisal-coping theory, the anxiety will further drive reactions in the mind which require the individual to manage those negative emotions, and the extra energy expenditure in managing them can unbalance the operation of the individual's psychological system thereby degrading mental health (Lazarus, 2007; Lazarus & Folkman, 1984; Thoits, 1995).

The neighborhood can be considered as a stressor since it fosters conditions which individuals recognize as stressful. In an unsafe neighborhood individuals are likely to feel threatened by possible crime (Austin, Furr, & Spine, 2002). Residents in an unsafe neighborhood usually suffer from fear, which is a negative emotion that can lead to an unbalanced psychological system and then to distress. A poor neighborhood can also structurally reduce the availability of coping resources. Both material and social resources in poor neighborhoods are limited. Access to health care services for its residents is relatively less in racially segregated, non-white neighborhoods, compared to that for residents in decent, predominantly white neighborhoods (Williams & Collins,

2001). Due to safety concerns, residents in poor neighborhoods may find it difficult to make friends, and their friends, probably in the same poor social conditions, may not be able to provide them with support (Belle, 1982). As a result, people in poor neighborhoods may be more likely to feel powerless and/or not be supported, because they are restrained by their place of residence. These feelings are also negative emotions and are detrimental to individuals' mental health.

These arguments theorize the neighborhood as a stressor and provide a rationale for the potential harm of disordered or disadvantaged neighborhoods. Thus, a lot of studies have examined neighborhood effects on various mental health outcomes. Many of them focus on the association between neighborhoods and depression. Their findings underscore a clear association between neighborhood characteristics, such as poverty and disorder, and individuals' depressive symptoms (see Cutrona, Wallace, & Wener, 2003 for a review). Among these studies, there are two major ways to assess neighborhood effects—the respondents' perceptions of the neighborhood and neighborhood SES. Each of them has its advantages and disadvantages. The following two sections will separately review studies using these two measurement tools. For each section, main findings of the literature will be reviewed to demonstrate how neighborhoods and depression are associated, and the disadvantages of using each measure will be discussed.

Neighborhood Perceptions and Depression

Prior evidence implies that perceptions of one's neighborhood are associated with depressive symptoms. The less satisfied the individual feels about his or her

neighborhood, the higher level of depressive symptoms he or she is likely to have. Using a sample of 877 adolescents in Los Angeles County, Aneshensel and Sucoff (1996) found that adolescents' subjective appraisal of their neighborhood was significantly associated with depression. In their study, youth who considered that many hazards were present in their neighborhood tended to have elevated depressive symptoms, whereas youth who considered that people in their neighborhoods knew each other well had a significantly lower level of depressive symptoms. Ross (2000) studied a sample of 2,482 adults aged from 18 to 92 living in Illinois to examine the association between neighborhoods and depression. After controlling for individual-level demographics, household structure, and urban residence, perceived neighborhood disorder—either physical or social disorder—was found to be significantly associated with adult depression. Based on a sample of 103 African American and European American mothers, Hill and Herman-Stahl's (2002) study provided evidence that perception of neighborhood influenced mother's depression; the more the mother perceived her neighborhood to be unsafe, the higher levels of depressive symptoms she would have. Latkin and Curry (2003) examined a community sample of 818 individuals recruited from an HIV prevention program. Through baseline interviews and follow-up interviews after nine months, they found a significant association between perceived neighborhood disorder and subsequent depressive symptoms, after adjusting for individual characteristics and baseline depressive symptoms. Hill, Ross and Angel's (2005) study used a sample of 2,402 women in highly impoverished urban neighborhoods in Chicago, Boston, and San Antonio. They found that the association between neighborhood disorder and self-rated health was

significantly reduced after adding depression, which suggested a possible association between neighborhood and depression. Studies investigating the association between perceived neighborhood disorder and depression have consistently demonstrated that residents' negative ratings of their neighborhoods were associated with higher levels of depressive symptoms regardless of individual characteristics.

While these studies provide much evidence for the contention that residents with negative perceptions of their neighborhood tend to have higher levels of depressive symptoms, it is also plausible that the alternative explanations can account for this pattern. Specifically, there are two possibilities that call into question the validity of the association between neighborhoods and depression: reverse causality and the potential that the association between neighborhoods and depressive symptoms is spurious. With respect to reverse causality, current research cannot rule out the possibility that depressed persons are evaluating their neighborhoods negatively. It should not be assumed that the direction of the link goes from neighborhood perceptions to depressive symptoms. It is possible that the association found in previous studies is due to the fact that depressed people may tend to rate their neighborhoods as stressful. This raises the potential that that the association between neighborhood perceptions and depression is spurious because an underlying negative cognitive style may account both for the unfavorable neighborhood ratings and for depressive symptoms (Abramson, Metalsky, & Alloy, 1989). Specifically, individuals who tend to attribute life events negatively and who are more likely to infer negative consequences from life situations are also more vulnerable to developing depressive symptoms (Alloy, Just, & Panzarella, 1997). In this instance, the negative

cognitive style associated with depression may result in a negative rating of one's neighborhood, rather than the depression itself.

The potential that these alternative explanations may contribute to the association between neighborhoods and depression may be caused by historical reliance on measuring neighborhood conditions using the respondents' ratings of neighborhoods. Although studies have shown a strong association between neighborhood perceptions and depression, it is still problematic to use the respondents' ratings of their neighborhoods to predict their depressive symptoms. In order to account for the subjectivity of using the self-reported measure, many studies have used neighborhood SES as a more objective assessment. The following section will review studies using this measure.

Disadvantaged Neighborhoods and Depression

Highly impoverished neighborhoods are considered particularly risky for their residents since poor conditions of the neighborhood produce stresses which can result in mental illnesses (Robert, 1999). Using neighborhood SES (i.e., aggregate-level SES) to assess neighborhood disadvantage, a rich body of literature supports the argument that people in disadvantaged neighborhoods are more likely to have higher levels of depressive symptoms. For example, among 50 neighborhoods in a large city in the Mid-Atlantic region of the United States, it was found that depression significantly varied across different neighborhood types ranging from advantaged to disadvantaged (Dupéré & Perkins, 2007). However, research is mixed as to whether these effects will be sustained after controlling for individual differences in social and economic advantage.

Some suggest a net effect of neighborhood SES on depression above and beyond individual vulnerabilities. In a longitudinal study of 1,120 residents in New York City, Galea et al. (2007) found that living in an environment of poor quality was associated with a greater likelihood of being depressed, after controlling for individual SES and baseline depressive symptoms. Using a nationally representative sample, Silver, Mulvey and Swanson (2002) found that neighborhood SES was associated with major depression after controlling for individual characteristics. Matheson et al. (2006) used a national sample of urban neighborhoods in Canada and found a significant effect of material deprivation in neighborhoods on depression, after adjusting for individual characteristics. Kubzansky et al. (2005) investigated depression among the elderly based on a community sample of 2,812 people aged 65 years or older. Their results suggested that neighborhood disadvantage was associated with higher levels of depression.

Not all studies in this area have shown an effect of neighborhood over and above individual SES. Other research suggests that neighborhood effects give little additional risk besides that resulting from a low individual SES. Henderson et al. (2005) found that neither neighborhood SES nor race diversity was associated with depression after controlling for individual demographics. Reijneveld and Schene (1998) found the prevalence of mental illnesses in disadvantaged urban areas in the Netherlands was mainly because low SES people tended to concentrate in these neighborhoods. Their results suggested no effect of neighborhood-level SES on mental disorders. Ross, Reynolds and Geis (2000) found that neighborhood poverty lost its initial significance in predicting depression after controlling for individual SES. Since the predominant method

used to measure neighborhood disadvantage is the aggregate-level SES, it is a premature conclusion that the neighborhood has no effects, since the method used in previous studies may fail to capture real neighborhood effects.

At present, neighborhood SES does not exhibit consistency in predicting individuals' depressive symptoms. This is because that neighborhood SES may just be a proxy for individual SES. As mentioned above, there are many studies that found a significant association between neighborhood SES and depression even after controlling for individual characteristics, but studies concluding a sustained association were criticized for their methodology. It is difficult to differentiate if the association found by this kind of studies was due to real neighborhood effects or due to the well-established association between individual characteristics and health (Macintyre & Ellaway, 2002; Diez-Roux, 2001).

Summary

Although prior evidence is not conclusive about the relationship between neighborhood SES and depression, the overall balance of studies using two measurement tools indicates a relatively strong association between neighborhoods and depression. At the same time, several gaps become apparent. First, with only a few exceptions, most studies used cross-sectional data. One limitation of the previous cross-sectional research on neighborhoods and depression is that the quality of neighborhoods is usually measured as the same point in time as is the outcome—depressive symptoms. This leaves open the potential for reverse causality—that depressed people evaluate their neighborhoods

negatively, and that depressed people are more likely to gravitate to disadvantaged or disordered neighborhoods. The effect of neighborhoods on changes in depression has rarely been tested using longitudinal data but such a test will help specify the temporal association between the two.

Second, researchers have devoted a lot of effort to find robust measures of the neighborhood. Many studies used the respondents' ratings of their neighborhoods and the results were consistent in the association between neighborhoods and depression. However, issues about reverse causality and negative cognitive styles call for more inquiry into the potential bias caused by using the self-reported measure. To reduce the subjectivity, advanced techniques have been applied to construct accurate aggregate-level SES based on census tracts. However, this measure is not consistent in predicting individuals' depressive symptoms. The vague distinction between neighborhood SES and individual SES makes it less valid to use this measure as well. As a result, the current study includes the interviewers' ratings of the respondents' neighborhoods as an objective measure which can account for the potential bias associated with using the respondents' ratings.

Stressful Neighborhoods, Social Support and Depression

If exposure to an undesirable environment is associated with depressive symptoms, the attention should then be given to coping resources that help individuals cope with the negative effects. There may be one or more factors that can interrupt the

effects of neighborhood conditions. For example, a neighborhood may differ in the degree to which it provides coping resources such as social support.

Social support is of special interest in the stress process because its absence can endanger well-being while its presence can help individuals to cope with stressors (Thoits, 1995). Social support has been conceptualized and measured in two ways: the quantity and the quality of relationships. The quantity of relationships refers to the number of ties in one's network, and the quality of relationships manifests the degree to which they feel close to and supported by their family and/or friends. In research examining the direct effect of social support on mental health, evidence suggested that both the quantity (Cohen & Wills, 1985; Kawachi & Berkman, 2001) and the quality of relationships (Aneshensel & Sucoff, 1996) are positively associated with better mental health.

An alternative hypothesis argues that social support may also serve as a buffer, moderating the impact of stressors on mental health by augmenting the coping resources available for people to draw upon. When social support is conceptualized as a buffer, the evidence is strongest when it is measured as the quality of personal relationships rather than their quantity. Kaniasty and Norris (1992), for example, found that high-quality relationships with others in the neighborhood could buffer the fear of crime in disordered neighborhoods.

The buffering role of social support can also be found in studies addressing networks ties and their effects if the relevant network ties are limited to supportive relationships. For example, the significant buffering effect found by Ross and Jang (2000)

of informal social ties on disordered neighborhoods is because they conceptualized informal ties as the degree to which neighbors will help each other and talk with each other. They were actually addressing the quality of those ties and provided evidence that the quality of relationships buffered neighborhood effects. Studies that assessed social support using the quantity of relationship without considering their quality usually concluded social support either had no impact (Latkin & Curry, 2003) or its effect varied across neighborhood conditions (Dupéré & Perkins, 2007; Elliott, 2000).

In addition to the patterns apparent in empirical research, it is consistent with several theoretical arguments to conceptualize social support as the quality of relationships. Thoits (1992) differentiated the quantity and the quality of relationships and argued that the quantity of relationships was actually a property of the social support system rather than social support itself. The social support system, as Thoits (1995) defined, is "that subset of persons in the individual's total social network upon whom he or she relies for socioemotional aid, instrumental aid, or both" (pp. 148). She pointed out that classic network indicators such as size, density, accessibility, and frequencies of contacts were all structural properties of the support system. Consistent with Thoits (1995), House, Umberson and Landis (1988) argued that social support should only include the quality and the content of relationships.

On the basis of these empirical and theoretical arguments, I conceptualize social support as the quality of relationships and hypothesize that social support will buffer the effect of stressful neighborhoods on depressive symptoms. Since social support has been long recognized as a buffer against stressful life events (Lin, Dean, & Ensel, 1986; Lin,

Ye, & Ensel, 1999), it is expected that social support would have a similar buffering effect on the influence of neighborhoods on mental health. I expect this effect with respect to respondents' ratings of neighborhoods because the neighborhood provides a place for social interaction. Neighborhoods can influence people's informal relationships with their neighbors (Sampson et al., 1997). Some neighborhoods are able to foster supportive relationships (e.g., people know each other well, share the same values, and trust each other), which are of particular importance to protect people from being depressed (Cutrona et al., 2003).

Research Questions and Hypotheses

As discussed in the literature review, research has shown that living in a stressful neighborhood is associated with higher levels of depressive symptoms. The literature suggests that the respondents' perceptions are strongly associated with depression, and neighborhood disadvantage, measured by aggregate-level SES is also associated with depression, but to a lesser extent. It remains unclear whether these associations are spurious or depend on other factors. Possibilities include that depressed people choose bad neighborhoods to live, and that depressed people evaluate their neighborhoods negatively.

A more accurate and more objective measure will help rule out these alternative explanations for the association between neighborhoods and depression. In the dataset used in the current study, there were questions asking the interviewer to rate the

respondents' neighborhood.[1] The interviewer's negative cognitive styles are not supposed to be correlated with the respondents' negative cognitive styles since the interviewer is not the resident in the neighborhood. In addition, in previous studies neighborhood SES is constructed based on census tracts. However, what one perceives to be his or her neighborhood is quite different from census tracts. Compared to scales constructed based on census tracts, I argue that the interviewers' perception is a more valid proxy for the objective conditions of the neighborhood.

It has also been suggested in the literature that social support can buffer the negative effect caused by a stressful environment. The current study tests the prediction that within the neighborhood where the individual feels stressful, social support will exert a buffering effect on depressive symptoms. Specifically, I hypothesize that people with high-quality relationships should have smaller increases in depression levels, compared with people with low-quality relationships. The buffering role of social support will also be tested longitudinally.

Therefore, the current study addresses the following research questions: 1) does the neighborhood itself produce effects on individuals' mental health net of individual characteristics? and 2) does social support buffer neighborhood effects? Specifically, the current study is going to examine if social conditions (neighborhoods), rather than individual selection, are determinants of mental illnesses (depression) and if the buffer (social support) operates across time. These questions will be examined both cross-sectionally and over time.

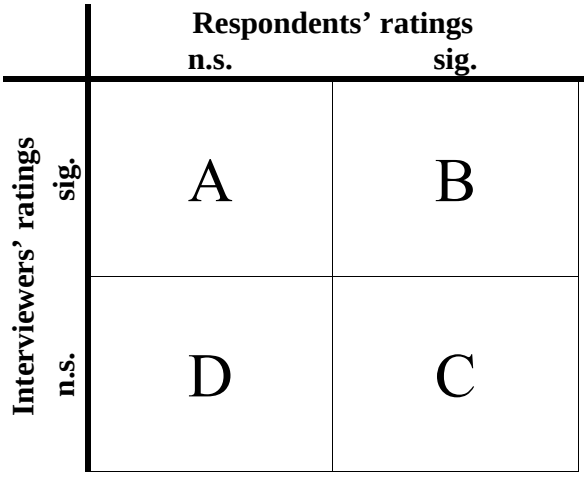
[1] Please see Chapter Two for a description of how this measure is constructed.

Two measures of the neighborhood—the respondents' and the interviewers' ratings of neighborhoods—will first be tested separately. The association between the respondents' ratings of neighborhoods and depressive symptoms will be tested to determine if the current study reveals neighborhood effects that are consistent with what was found in previous studies. This link will also be tested longitudinally to see if the respondents' ratings of neighborhoods are associated with changes in depressive symptoms over time.

The net effect produced by objective neighborhood conditions will be tested using the interviewers' ratings of neighborhoods. If the interviewer-reported neighborhood conditions have an effect on depressive symptoms, it will be consistent with the argument that at least some of the causal direction goes from neighborhoods to depression. If the effect is sustained net of respondents' SES, it will suggest that neighborhoods affect individuals above and beyond their socio-economic advantage.

These two measures of neighborhoods will also be tested together (Please see Figure 1). If the respondents' ratings of neighborhoods have a sustained significant effect on depressive symptoms while the interviewers' ratings do not, it will suggest that objective neighborhood conditions do not add an additional effect on the respondents' perceptions of their neighborhood (Block C, Figure 1). If only the interviewers' ratings of neighborhoods, but not the respondents' ratings, have an independent effect on depression, it will suggest that objective conditions of the neighborhood do affect residents' depressive symptoms (Block A, Figure 1). If both the interviewers' and the respondents' ratings have effects on depression, it will suggest that objective conditions

have some effects on depressive symptoms, but they cannot fully explain the variations in individuals' depressive symptoms (Block B, Figure 1). If both the respondents' and the interviewers' ratings are not significant, the interpretation will depend on if either or both of them are significant when tested separately (Block D, Figure 1).



A: Objective neighborhood conditions affect respondents' depressive symptoms independently.
B: Objective neighborhood conditions have some effects on depressive symptoms, but they cannot fully explain the variations.
C: Objective neighborhood conditions do not add any additional effect on the respondents' perceptions of the neighborhood.
D: Depends on whether either or both of them are significant when tested separately.

Figure 1: Test Two Measures of the Neighborhood Together

When the association between neighborhoods and depression is tested longitudinally, the time interval between baseline and follow-up interviews raises the problem that people do change their residences. Therefore, it is necessary to take into

account the effect of moving to a new neighborhood on depression. Since neighborhood is conceptualized as a stressor, the sample for the longitudinally analysis will be limited only to respondents who did not move during the time interval of the analysis.

Accordingly, hypotheses 1a, 1b, 1c, 2a, and 2b will examine whether and how the respondents' and the interviewers' ratings of neighborhoods affect baseline depressive symptoms and whether social support buffers the effects. Hypotheses 1d, 1e, 1f, 2c, and 2d will examine the main effect as well as the buffering effect longitudinally. All hypotheses are listed as below:

H1: Neighborhoods are negatively associated with depressive symptoms. Specifically,

H1a: In the baseline model, the respondents' negative ratings of neighborhoods are associated with higher levels of depressive symptoms at Wave I net of individual demographics.

H1b: In the baseline model, the interviewers' negative ratings of neighborhoods are associated with higher levels of depressive symptoms at Wave I net of individual demographics.

H1c: In the baseline model, both the respondents' and the interviewers' negative ratings of neighborhoods are associated with higher levels of depressive symptoms at Wave I net of individual demographics.

H1d: In the longitudinal model, for respondents who did not change their residences, the respondents' negative ratings of neighborhoods are

associated with higher levels of depressive symptoms at Wave III, net of individual demographics and depressive symptoms at Wave I.

H1e: In the longitudinal model, for respondents who did not change their residences, the interviewers' negative ratings of neighborhoods are associated with higher levels of depressive symptoms at Wave III, net of individual demographics and depressive symptoms at Wave I.

H1f: In the longitudinal model, for respondents who did not change their residences, both the respondents' and the interviewers' negative ratings of neighborhoods are associated with higher levels of depressive symptoms at Wave III, net of individual demographics and depressive symptoms at Wave I.

H2: Social support buffers neighborhood effects on depressive symptoms. Specifically,

H2a: In the baseline model, social support buffers the association between the respondents' ratings of neighborhoods and depressive symptom at Wave I.

H2b: In the baseline model, social support buffers the association between the interviewers' ratings of neighborhoods and depressive symptoms at Wave I.

H2c: In the longitudinal model, for respondents who did not change their residences, social support buffers the association between the respondents' ratings of neighborhoods and depressive symptoms at Wave III.

H2d: In the longitudinal model, for respondents who did not change their residences, social support buffers the association between the interviewers' ratings of neighborhoods and depressive symptoms at Wave III.

In all, the purpose of the current study is to investigate the cross-sectional and long-term neighborhood effects on depressive symptoms. Panel data from a nationally representative sample are used to address these research questions. The following chapter describes the quantitative method used to test these hypotheses.

CHAPTER TWO

METHODS

Description of Data

The dataset used in the current study is from a national panel survey entitled "Americans' Changing Lives: Waves I, II, III, and IV, 1986, 1989, 1994, and 2006"(House, 1986a). The Americans' Changing Lives (ACL) study surveyed the continental US household population aged 25 and older. The survey used a multistage stratified area probability sampling procedure with an oversample of African Americans and people aged 60 years and older. The ACL data was first collected in 1986 (Wave I) using face-to-face interviews. Wave I survey included 3,617 cases. Attempts to contact all Wave I respondents were made in the following waves. Wave II survey interviewed 2,867 people face-to-face in 1989. They represented eighty-three percent of the respondents in Wave I who were still alive at the time of the Wave II follow up. Wave III included 2,562 respondents. Eight percent were interviewed face-to-face and ninety-two percent were interviewed via telephone. Among all Wave III cases, 164 interviews were completed by proxy respondents instead of original respondents in Wave I. Wave IV survey in 2004 included 1,787 interviews in person (5%) and via telephone (95%), among which 1,692 interviews (95%) were self-reported and 95 (5%) were proxies.[2,3]

[2] Wave I interviews were all self-reported and were completed face-to-face. Wave III survey included both proxies and self-reported interviews and used two different modes of data collection—face to face and by telephone. However, the predominant method used to complete interview is via telephone (92%), and most of interviews were self-reported (94%). The difference generated by different approaches of data collection should be small. From the results of cross-tabulations and t-tests (not shown in the table), study variables in the current study did not significantly vary across different modes of interview.

[3] The Wave IV (2004) data was collected between 2001 and 2003. Please see House (1986b).

One of the goals of the ACL study is to investigate how individuals cope with life events and stresses that may affect maintenance of health, effective functioning, and productive activity (House, 1986b). The current study particularly aims to determine whether neighborhood environment has an impact on individuals' mental health in terms of changes in depressive symptoms over time; and whether social support helps to buffer the negative impact of stressful neighborhoods. Only Wave I to Wave III data are used here. Data on neighborhood conditions, social support, demographics, and baseline depressive symptoms from Wave I were used to predict depressive symptoms eight years later at Wave III (1994). For more information about the ACL study design, please refer to House (1986b).

Study Samples

Wave I Full Sample

In the baseline model, only respondents in Wave I interview are incorporated (N = 3617). After missing values are excluded listwise, the total number of valid respondents is 3,563. The mean age of Wave I respondents was 53.61 years old (*S.D.* = 17.61, *Range* [24,96]). Thirty-two percent were African Americans, sixty-four percent were white, and four percent were from other racial groups. Thirty-eight percent of the Wave I respondents were males and sixty-two were females. Fifty-five percent were married at the time of Wave I interview and forty-five percent had never been married, were divorced, separated, or widowed at that time. On average, Wave I respondents had

completed high school (Highest year of education: *M* = 11.47, *S.D.* = 3.47, *Range* [0, 17]). The respondents' median annual family income was from $15,000 to $19,999.[4]

Wave III Full Sample

This sample will not be used for main analysis. Rather, it is used to compare with Wave I sample to see whether people who were present at Wave III differ from those who were not in any of the study variables.[5] After excluding missing values listwise, 2,398 respondents are available for analysis. The mean age of Wave III respondents was 57.58 (*S.D.* = 16.05, *Range* [31,95]) at the time of Wave III data collection. Sixty-nine percent were white, twenty-eight percent were African Americans and three percent were of other races. Thirty-seven percent were males, and fifty-seven percent of them were married at the time of Wave III interview. On average, they had 12.14 years of education (*S.D.* = 3.15, *Range* [0,17]). The respondents' median family income for the year before Wave III survey was from $25,000 to $29,999.

Wave III Subsample—Not Moved

When using baseline neighborhood measures to predict depressive symptoms eight years later in Wave III, people who left their original neighborhoods and moved to a new residence any time during the three waves of data collection are excluded from the longitudinal analyses, in order to keep the stressor (neighborhood) consistent across time.

[4] Unweighted statistics were reported when describing all samples.
[5] This sample will also be used to perform pos-hoc analysis. Please see the "pos-hoc analysis" section in Chapter Three.

Casting the data in this way is beneficial for the purpose of the current study because it helps avoid the potential confounding of neighborhood change and the effect of moving. In the ACL study, 664 people indicated that they had moved between Wave I and Wave II and 821 people indicated that they had moved between Wave II and Wave III. Finally, after excluding the missing values listwise, at the time of the Wave III follow-up interview, 1,396 of the original respondents are eligible for analysis. Respondents in this sample had a mean age of 62.51 years old (*S.D.* = 14.58, *Range* [32, 95]). More than two-thirds (69%) of the respondents were white, twenty-nine percent were African Americans, and two percent were of other races. Thirty-six percent of the respondents were males and sixty-five percent were females. Fifty-nine percent of the respondents were married at the time of Wave III survey. Respondents in this sample had approximately 12 years of education on average (Highest year of education: *M* = 11.79, *S.D.* = 2.80, *Range* [0,17]), and the respondents' median annual family income was from $25,000 to $29,999.

Wave III Subsample—Moved

Another sample is created that consists only of respondents who had moved between Wave I and Wave III and were available at Wave III. This sample will not be used for main analysis. Rather, it is used to test if people who moved differ from those who did not in any of the study variables.[6] Missing values are excluded listwise and 963 respondents are available for the analysis. Respondents in this subsample had a mean age of 50.45 years old (*S.D.* = 15.39, *Range* [31,95]). Twenty-seven percent of respondents in

this sample were African Americans, sixty-nine percent were white, and four percent were of other races. Thirty-nine percent of them were males, and fifty-two were married at the time of Wave III survey. Respondents in this sample had completed approximately 13 years of education (Highest year of education: M = 12.64, $S.D.$ = 2.92, *Range* [0,17]). The respondents' median family income for the year before Wave III survey was from $25,000 to $29,999.

Measures[7]

Depression

The dependent variable, depressive symptoms, is measured using the 11-item short version of the Center for Epidemiologic Studies Depression (CES-D) Scale. Both the original 20-item CESD and the 11-item short version (CESD-11) were created by Radloff (1977). In the short version used in ACL, respondents were asked to rate on a 3-point scale for each statement to indicate how often, that is, "Never/Hardly ever", "Some of the time", or "Most of the time", they felt that way in the past week. In Wave I data, a depression index was calculated by averaging the scores of all 11 items—feeling depressed, restless, happy (reverse scored), lonely and sad; feeling that people dislike me; people are unfriendly; I enjoy life (reverse scored); I have a poor appetite; cannot keep going; and everything is an effort. In the dataset, every item was standardized using the Wave I weighted means and standard deviations before combined for each following

[6] This subsample will also be used to perform post-hoc analysis. Please see the "post-hoc analysis" section in Chapter Three.
[7] Items of main measures are described in Appendix A.

waves, and the final index was re-standardized after combined items using the Wave I weighted index mean and standard deviation.[8] The reliability of CESD-11 is similar across various demographics in the general population (Radloff, 1977). In current study, the CESD-11 shows good internal reliability across three waves (Wave I CESD-11 for Wave I sample: α = .62; Wave I CESD-11 for Wave III sample: α = .62; Wave III CESD-11 for Wave III Sample: α = .62[9]). The validity of CESD-11 has been tested. It is correlated with clinical ratings of depression and with other self-reported depression rating scales (Radloff, 1977). The 11-item short version also demonstrates similar factor structure as the complete 20-item scale (Radloff, 1977). Although the CESD scale is not designed for clinical diagnosis, it is a sensitive tool for detecting depressive symptoms and change in symptoms over time (Weissman, Scholomskas, Pottenger, Prusoff, & Locke, 1977).

Respondents' Ratings of Neighborhoods

There are two measures that are used to access neighborhood effects—the respondents' and the interviewers' ratings of neighborhoods. The degree to which the respondent perceives his or her neighborhood to be stressful has been suggested by the literature to be associated with depressive symptoms. The more dissatisfied individuals are with their neighborhoods, the higher levels of depression they are more likely to have.

[8] The standardized index of CESD-11 was constructed in the ACL dataset. The author of ACL recommended using this standardized index for analysis. Please refer to House (1986b) for detailed information of the standardized index. In the current study, when reporting descriptive statistics and performing T-Tests, the mean score of original, unstandardized CESD-11 items is used; the standardized index of CESD-11 is only used when performing regression analyses.
[9] All α scores are Cronbach's α's based on standardized items.

In the current study, the respondents' ratings of neighborhoods are measured by asking respondents how satisfied they were with their neighborhoods. Respondents were asked to rate on a 5-point scale to indicate whether they were "Completely satisfied", "Very satisfied", "Somewhat satisfied", "Not satisfied" or "Not at all satisfied" with their neighborhoods. This scale is scored in the direction that higher values indicate higher levels of dissatisfaction.

Interviewers' Ratings of Neighborhoods

Disadvantaged neighborhoods are usually indicated by the lower level of neighborhood SES which is an objective assessment of neighborhood effects. Since this measure did not demonstrate consistent results in predicting depression in prior research, an alternative means of measurement is tested in the current study. The interviewers' ratings of the respondents' neighborhoods are used to explore if neighborhood disadvantage had an independent effect or not. This indicator is measured by two items. After the interview was complete, interviewers were asked to rate on a 4-point scale the following two questions: 1) how well the structures in the respondents' neighborhood are kept; and 2) how well the yards and/or sidewalks in front of the structures in the neighborhood are kept and cared for. These two items are highly correlated (r = .83, not shown in tables) and are combined into a single measure by summing the two scores. High values in this measure indicate higher levels of disadvantage.

Social Support

The social support scale was based on House and Kahn's (1985) work, which assesses the quality of five types of relationship including the relationship with 1) one's spouse, 2) children over the age of 16, 3) mother, 4) father, and 5) friends and relatives other than spouse, child, or parent. For each relationship, the scale includes four questions: "How much does your (type of relationship) make you feel loved and cared for?", "How much (is/are) (he/she/they) willing to listen when you need to talk about your worries or problems?", "How much do you feel (he/she/they) (makes/make) too many demands on you?", and "How much is (he/she/they) critical of you or what you do?". Respondents were asked to rate on a five-point scale including "A great deal," "Quite a bit," "Some," "A little," and "Not at all." In the dataset, the index for each relationship was constructed by taking the arithmetic mean of the four items used and it was scored in the direction that high values indicate high support from that relationship. Each of the indices has been standardized in the dataset, such that for each relationship, positive scores indicate positive support and negative scores indicate negative support. Five indices together constitute the social support scale used in the current study, and they demonstrates good internal reliability (Wave I: $\alpha = .67$). In the current study, the mean score of the five indices are used as the measure of total social support for a respodent.

Covariates

A number of other covariates are included in the analysis. It is well known that personal factors are important in predicting depressive symptoms because individual

characteristics are able to produce contextual effects, which are actually due to the composition of the neighborhood (Jencks & Mayer, 1990). Therefore, it is necessary to incorporate individual characteristics in the analysis in order to evaluate net effect of neighborhood environment. Among most frequently used demographics, age, race, gender, marital status, and SES are included in the current study.

Age. Cross-sectional studies often showed a negative effect of age on depression that older people had higher levels of depressive symptoms (e.g. Ross 2000). Age can also interact with neighborhood perceptions to impact depression. La Gory and Fitpatrick (1992) found that functionally impaired elders living in less age dense or low-accessibility neighborhoods experienced an increase in depressive symptoms whereas functionally less healthy elders with greater environmental satisfaction had lower depression. In longitudinal studies age was found to be associated with depression initially (Mirowsky & Ross, 1992; Roberts, Kaplan, Shema, & Strawbridge, 1997; Penninx et al, 2001). The current study uses the respondents' self-reported age, measured as a continued variable, to control for age effect.

Race. Being a minority group member is associated with greater vulnerability to a host of stressors. The racial difference in mental health is even sustained after controlling for SES (Williams, Yu, Jackson & Anderson, 1997). In the community studies, residential segregation based on race, as one of the main forms of discrimination, affects mental health in minorities, especially in African Americans (George & Lynch, 2003; Kessler, Mickelson, & Williams, 1999; Williams, Neighbors, & Jackson, 2003). In the

current study race is coded as a dichotomized variable with "1" indicating white, and "0" indicating African Americans and all other races.

Gender. Women are found to report a significantly higher rate of depression than men (e.g., Gove & Tudor, 1973). Gender differences could not be fully explained by marital status (Simon, 2002), which suggested that gender had some independent influence on depression. In neighborhood studies, gender plays an important role because of the association between gender and social relationships in neighborhoods (Umberson, Chen, House, Hopkins, & Slaten, 1996). Females as the primary caregivers of their children may pay more attention to their neighborhoods (Cutrona et al., 2005). Therefore, it is possible that women are more likely to report neighborhood problems. On the other hand, women are more relational and thus may experience greater benefits from social support than do men. As a result, gender differences should be considered in the analysis. In the current study gender is coded as a dichotomized variable with "1" indicating males and "0" indicating females.

Marital Status. Having an intimate relationship is found to help reduce people's vulnerability to certain stressors (Pearlin & Johnson, 1977; Kessler & Essex, 1982). Marriage is also related to perceived social support which helps protect people from being depressed (Thoits, 1986; 1987). In the current study, being married is coded as "1" while being never married, divorced or separated, and widowed are coded as "0".

SES. Individual's SES can influence one's mental health in a variety of ways. Low SES itself can be a main risk factor for mental illness (Link, Dohrenwend, & Skodol, 1986; Miech & Shanahan, 2000). Variations in individuals' SES can produce

differences in vulnerability to other stressors (McLeod & Kessler, 1990), or differences in resources that individuals can draw upon to cope with stressors (Barrera, 1980). Due to this well-established association between individual SES and mental health, it is very important to make sure that the analysis can reveal net effect of neighborhoods regardless of individual SES. A SES variable measuring the respondents' socio-economic status is created in the ACL dataset. This measure combined levels of education and total annual household income. It includes four categories: low SES includes respondents who have 0—11 years of education and whose household income less than $20,000 per year; lower-middle SES includes respondents who have 0—11 years of education and more than $20, 000 household income OR 12 or more years of education and household income less than $20,000; upper-middle SES includes respondents with 12—15 years of education and more than $ 20,000 income; high SES includes respondents with 16 or more years of education and more than $20,000 income.

Overview of Analysis[10]

A series of Ordinary Least Squares (OLS) regression models will be conducted to examine the independent variables and their capacity to explain variance in the dependent variable, depression. The analysis proceeds in two stages—cross-sectional and longitudinal analysis. For the baseline models (Figure 2), Model I will examine the association between the respondents' ratings of neighborhoods and baseline depressive symptoms, controlling for respondents' age, race, gender, marital status, and SES at

[10] The oversampling was adjusted by controlling for demographics in the model.

Wave I (Hypothesis 1a), and test the buffering effect by adding social support and the interaction term of social support and the respondents' ratings (Hypothesis 2a) using all Wave I respondents. Model II will examined the association between the interviewers' ratings of neighborhoods and baseline depressive symptoms, using age, race, gender, marital status and SES at Wave I as controls (Hypothesis 1b), and test the buffering effect by adding social support and the interaction term of social support and the interviewers' ratings (Hypothesis 2b). To reduce multicollinearity, the main effect, the buffer and the interaction term will be centered using Aiken and West's (1991) method. Model III will include both the respondents' and the interviewers' ratings of neighborhoods, and demographic covariates to test if either of the neighborhood measures remains significant even after controlling for the influence of the other (Hypothesis 1c). Considering the shrinkage of the cohort in longitudinal analysis, especially when data used here span 8 years of observation, it is worth comparing people who were still available in Wave III to the Wave I full sample. Model IV to Model VI will duplicate the above three models using respondents who were available in Wave III and did not move between Waves I and III.

Baseline models DV: Depression at Wave I					
Wave I Sample			Wave III Subsample – Not Moved		
I (Table 3)	II (Table 5)	III (Table 8)	IV (Table 4)	V (Table 7)	VI (Table 9)
Respondents' ratings of neighborhoods	Interviewers' ratings of neighborhoods	Respondents' and Interviewers' ratings of neighborhoods	Respondents' ratings of neighborhoods	Interviewers' ratings of neighborhoods	Respondents' and Interviewers' ratings of neighborhoods
Age, race, gender, marital status, SES					
Social support					
Interaction	Interaction		Interaction	Interaction	

Figure 2. Overview of Baseline Analysis

Three longitudinal models (Figure 3) will only include people who did not move between Wave I and Wave III. Model VII will predict depressive symptoms at Wave III using the respondents' rating, social support and the interaction term of social support and the respondents' rating, controlling for age, gender, race, SES, and depressive symptoms at Wave I (Hypothesis 1d; Hypothesis 2c). Model VIII will predict depressive symptoms at Wave III using the interviewers' rating, social support and the interaction term of social support and the interviewers' ratings, controlling for age, gender, race, SES and depressive symptoms at Wave I (Hypothesis 1e; Hypothesis 2d). The interaction terms will also be centered in the longitudinal models. Model IX will include the

respondents' and the interviewers' ratings of neighborhoods, baseline depressive symptoms, and demographic covariates to test if any of the neighborhood measures remains significant even after controlling for the influence of the other (Hypothesis 1f).

Longitudinal Models DV: Depression at Wave III		
Wave III Subsample - Not Moved		
VII (Table 10)	VIII (Table 11)	IX (Table 12)
Respondents' ratings of neighborhoods	Interviewers' ratings of neighborhoods	Respondents' and Interviewers' ratings of neighborhoods
		Depression at Wave I
Age, race, gender, marital status, SES		
Social support		
Interaction	Interaction	
Depression at Wave I		

Figure 3. Overview of Longitudinal Analysis

One of the methodological concerns in longitudinal analysis is attrition. Although follow-up rates were satisfactory in all subsequent waves of the ACL study (House 1986b), it is possible that the shrinkage of cohort, mainly due to mortality, may influence the sample and lead to biased parameter estimations toward increasing homogeneity in

respondents' depressive symptoms across waves. To test if the distribution of the dependent variable is influenced by attrition, the attrition weight for Wave III is entered into all longitudinal models as an independent variable and is insignificant in all models, suggesting that the dependent variable did not vary by attrition.[11] All my final models are not adjusted for attrition.

Results of the analysis are presented in the following chapter.

[11] Comparing results of models with attrition weight as an independent variable with those without attrition weight, the coefficients of main study variables almost remained the same.

CHAPTER THREE

RESULTS

This chapter will present the results of the analysis, which examines the main effect of neighborhoods and the buffering effect of social support on depression. First, descriptive statistics of study variables are presented, followed by a series of T-Tests and Cross-Tabulations which examine if two subsamples—those respondents who changed their residences between Waves I and III and those who did not—differed in any of the study variables. Second, the correlations between study variables are presented to identify covariates and to detect multicollinearity. Third, the results of regression analysis are presented, interpreted and discussed according to each study hypothesis. Unstandardized OLS coefficients (B) are reported in the table. For some variables, changes in standardized coefficients (β) are tested for their significance. Finally, the post-hoc analysis is performed to explore remaining issues in the main results.

Statistical Package for the Social Sciences (SPSS) is used to analyze data. Due to the sample size of this study, the significance level is set at .01.

Descriptive Statistics of Demographics and Study Variables

Table 1a shows the descriptive statistics of demographics and all study variables that were measured at Wave I. In addition, a series of T-Tests and Cross-Tabulations is performed to see whether people who were present at Wave III were different from people who were not present between waves in any of the study variables. Corresponding levels of significance are reported in Table 1a.

Table 1a. Descriptive Statistics of Demographics and Study Variables Measured at Wave I [a, b, c]

	Wave I Sample					
	Full Sample (N = 3563)			Wave I Respondents Present at Wave III (N = 2359)		
	M	*S.D.*	*Range*	*M*	*S.D.*	*Range*
Age (Wave I)	53.61	17.61	[24,96]	49.93***	16.02	[24,90]
	Percentage			*Percentage*		
White	64%			69%***		
Male	38%			37%[n.s.]		
Married (Wave I)	55%			60%***		
	M	*S.D.*	*Range*	*M*	*S.D.*	*Range*
SES (Wave I)	2.17	1.00	[1,4]	2.37***	.99	[1,4]
Respondents' Ratings (Wave I) (HI = Dissatisfied)	2.26	1.06	[1,5]	2.24[n.s.]	1.03	[1,5]
	Percentage			*Percentage*		
1=Completely satisfied	27%			26%		
2=Very satisfied	37%			38%		
3=Somewhat satisfied	25%			26%		
4=Not very satisfied	8%			7%		
5=Not at all satisfied	4%			4%		
	M	*S.D.*	*Range*	*M*	*S.D.*	*Range*
Interviewers' Ratings (Wave I) (HI = Disadvantaged)	3.45	1.45	[1,8][d]	3.31***	1.39	[1,8]
	Percentage			*Percentage*		
Structures						
1=Very well	47%			51%		
2=Mixed	40%			39%		
3=Poorly	11%			9%		
4=Very poorly	2%			2%		
Sidewalks/Yards						
1=Very well	40%			44%		
2=Fairly well	45%			43%		
3=Poorly	13%			10%		
4=Very poorly	3%			2%		

Table 1a. Descriptive Statistics of Demographics and Study Variables Measured at Wave I (Continued)

	Wave I Sample					
	Full Sample (N = 3563)			Wave I Respondents Present at Wave III (N = 2359)		
	M	*S.D.*	*Range*	*M*	*S.D.*	*Range*
Social Support (Wave I)	.07	.79	[-4.68, 1.43]	.05 [n.s.]	.75	[-4.68,1.43]
Depression (Wave I)	1.43	.37	[1,3]	1.40***	.35	[1,2.91]

[a] Source: Americans' Changing Lives
[b] Unweighted statistics were reported in this table.
[c] ** p<.01; *** p< .001; n.s. Insignificant
[d] When the interviewers' ratings of neighborhoods was calculated, respondents who only gave answers to one of the two questions were included. See also the "Measures" section in Chapter Two.

The unstandardized mean score of depressive symptoms at Wave I of all Wave I respondents was 1.43 (*S.D.* = .37, *Range* [1,3], Table 1a). For Wave I respondents who were present at Wave III, the mean score of their baseline (Wave I) depressive symptoms (*M* = 1.40, *S.D.* = .35, Table1a) was slightly lower than that of Wave I full sample. The results of T-Tests indicate that Wave I respondents who were present at Wave III had significantly lower levels of depressive symptoms than those who dropped out between Waves I and III. The degree of dissatisfaction with neighborhoods for respondents who were present at Wave III did not differ from those who were not. However, the result in the interviewers' rating indicates that people who were present at Wave III lived in significantly better neighborhood conditions. Two subsamples—those who were present at Wave III and those who were not—did not differ in levels of social support at Wave I.

People who were younger, white, married, and had higher SES tended to still be present at the time of Wave III. The samples did not differ in gender composition, however.

Table 1b presents descriptive statistics for demographics and study variables measured at Wave III. A series of T-Tests and Cross-Tabulations examines whether people who changed their residences were different from those who did not, in terms of demographics, the respondents' ratings of neighborhoods at Wave III and depressive symptoms at Wave III. Levels of significance from T-Tests and Cross-Tabulations are reported in Table 1b.

Table 1b. Descriptive Statistics of Demographics and Study Variables Measured at Wave III [a, b, c, d]

	Wave III Sample					
	Full Sample			Subsamples		
				Not Moved	Moved	
	(N = 2359)			(N = 1396)	(N = 963)	
	M	*S.D.*	*Range*	*M*	*M*	Sig.
Age (Wave III)	57.58	16.05	[31,95]	62.51	50.45	***
	Percentage			*Percentage*	*Percentage*	
White	69%			69%	69%	n.s.
Male	37%			36%	39%	n.s.
Married (Wave III)	57%			59%	52%	***
SES (Wave I) [c]	*M*	*S.D.*	*Range*	*M*	*M*	
	2.37	.99	[1,4]	2.32	2.45	**
	M	*S.D.*	*Range*	*M*	*M*	Sig.
Respondents' Ratings (Wave III) (HI = Dissatisfied)	2.17	1.06	[1,5]	2.09	2.30	***
	Percentage			*Percentage*	*Percentage*	
1=Completely satisfied	31%			35%	26%	
2=Very satisfied	34%			34%	35%	
3=Somewhat satisfied	25%			22%	28%	
4=Not very satisfied	6%			6%	7%	
5=Not at all satisfied	4%			4%	5%	
	M	*S.D.*	*Range*	*M*	*M*	Sig.
Depression (Wave III)	1.34	.34	[1,3]	1.33	1.36	n.s.

[a] Source: Americans' Changing Lives
[b] Unweighted statistics were reported in this table.
[c] SES measured at Wave I were reported in this table. The SES variable was not measured at Wave III.
[d] ** p <.01; *** p < .001; n.s. Insignificant

Comparing Table 1a to Table 1b, it is apparent that the mean score of Wave III depressive symptoms for Wave III respondents (M = 1.34, *S.D.* = .34, Table 1b) decreased compared to that at Wave I (M = 1.40, *S.D.* = .35, Table 1a), suggesting that Wave III respondents might become less depressed over eight years. Patterns of the decreased depressive symptoms across time are also examined for the subsamples—those who moved and who did not move. People who moved had higher baseline (Wave I) depression scores than those who did not ($M_{\text{not moved}}$ = 1.38; M_{moved} = 1.45, not shown in the table). This difference is statistically significant ($p < .001$, not shown in the table). The difference in Wave III depression score between people who moved and who did not move is not statistically significant. People who moved had a significantly larger decrease in depressive symptoms than those who did not move (Change in depression from Wave I to Wave III: $M_{\text{not moved}}$ = .11, M_{moved} = .25, $p < .001$; not shown in the table). This suggests that those who moved also had lower depression scores at Wave III. It makes them more similar in depression scores to those who did not move between waves.

For Wave III respondents, the degree of dissatisfaction with neighborhoods decreased across time ($M_{\text{Wave I}}$ = 2.24, $M_{\text{Wave III}}$ = 2.17, Table 1a, b). People who moved had higher levels of dissatisfaction with their neighborhoods in both Wave I ($M_{\text{not moved}}$ = 2.12, M_{moved} = 2.41, $p < .001$, not shown in the table) and Wave III ($M_{\text{not moved}}$ = 2.09, M_{moved} = 2.30, $p < .001$, Table 1b). The result in the interviewers' ratings at Wave I indicates that neighborhood conditions for those who moved were worse than those who did not ($M_{\text{not moved}}$ = 3.19, M_{moved} =3.48, p< .001, not shown in the table).

The mean score for Wave I respondents' perceived social support from spouse, children, mother, father, and friends and relatives at Wave I was .07 (*S.D.* = .79, *Range* [-4.68,1.43], Table 1a), indicating a balance of positive support and negative hassles from all sources. People who moved had significantly lower levels of baseline social support ($M_{\text{not moved}}$ = .11, M_{moved} = -.04, p< .001, not shown in the table).

People who moved were younger at the time of Wave III interview ($M_{\text{not moved}}$ = 62.51, M_{moved} = 50.45, $p < .001$, Table 1b) and more likely to be unmarried at the time of Wave III data collection (Percentage of married: Not moved—59%, Moved—52%, $p <$ .001, Table 1b). People who changed their residencies were not different than people who did not in terms of either race or gender.

Correlations Among Study Variables

Table 2 provides the correlations among study variables. The correlation matrix can be used to identify covariates, and to detect multicollinearity among study variables. Multicollinearity is of particular concern in this study because of the potential for overlap between the respondents' and the interviewers' ratings of neighborhoods. As shown in Table 2, none of the Pearson Correlation Coefficient is above .40, indicating little multicollinearity. Directions of correlations among major study variables largely correspond with expectations derived from the hypotheses that both the respondents' and the interviewers' unfavorable ratings of neighborhoods correlate with low levels of social support and high levels of depression, and that social support is inversely correlated with

depression. Of all demographic variables shown, no correlation direction is contrary to hypothesized expectations.

Table 2. Correlations Among Study Variables (N= 2363)[1,2]

	1	2	3	4	5	6	7	8	9	10	11
1. Age (Wave I)	1.00										
2. White	.07	1.00									
3. Male	-.14[c]	.06[b]	1.00								
4. Married (Wave I)	-.01	.19[c]	.15[c]	1.00							
5. SES (Wave I)	-.29[c]	.25[c]	.17[c]	.29[c]	1.00						
6. Respondents' Ratings (Wave I) (HI = Dissatisfied)	-.21[c]	-.11[c]	.00	-.07[c]	.02	1.00					
7. Respondents' Ratings (Wave III) (HI = Dissatisfied)	-.19[c]	-.13[c]	.02	-.10[c]	.00	.32[c]	1.00				
8. Interviewers' Ratings (Wave I) (HI = Disadvantaged)	-.07[c]	-.33[c]	-.04	-.21[c]	-.39[c]	.21[c]	.17[c]	1.00			
9. Social Support (Wave I)	.27[c]	.05	-.10[c]	.00	-.05	-.23[c]	-.21[c]	-.08[c]	1.00		
10. Depression (Wave I)	-.11[c]	-.17[c]	-.11[c]	-.20[c]	-.20[c]	.20[c]	.21[c]	.20[c]	-.32[c]	1.00	
11. Depression (Wave III)	-.01	-.23[c]	-.07[c]	-.14[c]	-.26[c]	.09[c]	.24[c]	.20[c]	-.23[c]	.48[c]	1.00

[1] Source: Americans' Changing Lives
[2] Missing values are excluded listwise.
[b] $p < .01$, [c] $p < .001$

OLS Regression Analysis

Regression models for baseline data and longitudinal data are performed in order to investigate the magnitude of the individual and collective contributions of independent variables in explaining variations in depression. Results of regression analyses are presented for each study hypothesis. Tables include adjusted R-square (Adj-R^2), unstandardized coefficients (B), standard error (s.e.), and the significance level (*) of each coefficient.

Hypothesis Testing

H1a: In the baseline model, the respondents' negative ratings of neighborhoods are associated with higher levels of depressive symptoms at Wave I net of individual demographics.

H2a: In the baseline model, social support buffers the association between the respondents' ratings of neighborhoods and depressive symptom at Wave I.

Models in Table 3 test whether and the extent to which baseline depressive symptoms are associated the respondents' ratings of neighborhoods, demographics, social support, and the interaction of the respondents' ratings and social support for the Wave I full sample. In Model 1 (Table 3), higher levels of dissatisfaction with the neighborhood are associated with higher levels of depressive symptoms (B = .199, $p < .001$). The respondents' ratings of neighborhoods alone explain a satisfactory proportion of variances in depressive symptoms (Adj-R^2 = 4%). Model 2 (Table 3) indicates that respondents who were older, white, males, married, and in higher SES tended to have

lower levels of depressive symptoms. After controlling for demographics, the significant effect of neighborhood perceptions on depression is sustained (B = .163, $p < .001$). A test of change in standardized coefficients (not shown in the table) is performed using Paternoster, Brame, Mazerolle, & Piquero's (1998) equation.[12] As a result, the standardized coefficient of neighborhood perceptions does not drop significantly (Change in β's: .037, $z = 1.63^{n.s.}$, not shown in the table). Hypothesis 1a is supported, suggesting that the respondents' ratings were associated with depressive symptoms at Wave I net of individual demographics.

[12] Please see page 862 in Paternoster, Brame, Mazerolle, & Piquero's (1998) article. The formula used for this statistical test is: $z = \frac{b_1 - b_2}{\sqrt{SEb_1^2 + SEb_2^2}}$, where b_1 and b_2 represent two regression coefficients, and SEb_1 and SEb_2 represent the standard errors of those two coefficients.

Table 3. Unstandardized OLS Coefficients Regressing Wave I Depression Index on the Respondents' Ratings of Neighborhoods, Demographics, Social Support and the Interaction Term for Wave I Full Sample (N = 3563)

	Model 1		Model 2		Model 3		Model 4	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Respondents' Ratings	.199	***	.163	***	.105	***	.103	***
	(.016)		(.016)		(.016)		(.016)	
Age			-.007	***	-.003	***	-.003	***
			(.001)		(.001)		(.001)	
White			-.147	***	-.135	***	-.135	***
			(.037)		(.035)		(.035)	
Male			-.137	***	-.190	***	-.187	***
			(.035)		(.034)		(.034)	
Married			-.248	***	-.235	***	-.233	***
			(.036)		(.034)		(.034)	
SES			-.210	***	-.201	***	-.199	***
			(.019)		(.018)		(.019)	
Social Support					-.388	***	-.381	***
					(.021)		(.022)	
Respondents' Ratings × Social Support							-.036	†
							(.018)	
Constant	.110		1.218		1.000		.989	
Adj-R^2	4%		12.3%		19.8%		19.8%	

† $p < .05$, ** $p < .01$, *** $p < .001$
Source: Americans' Changing Lives
Note: Corresponding to Model I in Figure 2.

Another goal of the baseline analysis is to test the buffering effect of social support (Model 3 and 4, Table 3). When tested as a main effect, higher levels of social support are associated with lower levels of depressive symptoms at Wave I (B = -.388, $p < .001$). Introducing social support reduced the size of the neighborhood coefficient by about one third, suggesting that lack of social support might be an element of the

association between the respondents' ratings of neighborhoods and depressive symptoms. The potential that social support may buffer the effect of the respondents' ratings on depressive symptoms is tested by multiplying the centered main effect and the centered buffer. However, social support only exerts a marginal buffering effect indicated by the .05 significance level (B = -.036, p = .048). Although the effect is small (β = -.030), it is consistent with the expectations of hypothesis 2a. The buffering effect is illustrated in Figure 3 (Jose, 2003). For people with high social support, the gradient of neighborhood effects on depression is smaller than those with medium support, and is much smaller than those with low support. Thus Hypothesis 2a is partially supported.

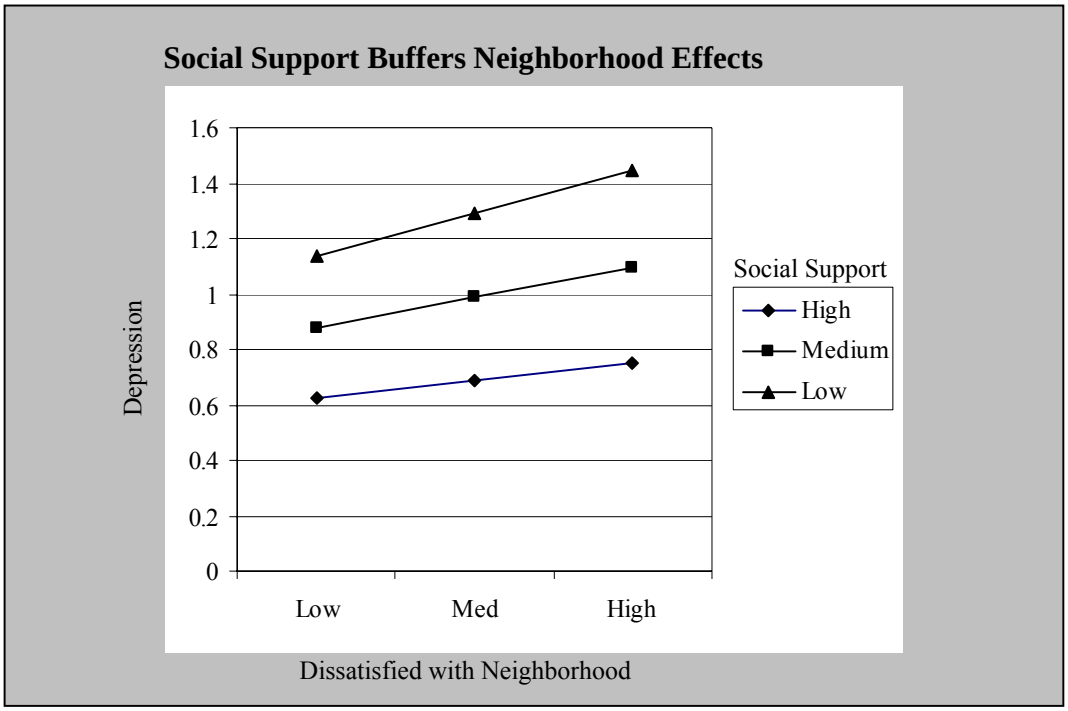


Figure 4. Social Support Buffers Neighborhood Effects on Depression

It is important to compare respondents who were present at Wave III to those who were not in terms of neighborhood effects on baseline depressive symptoms because in the longitudinal models, only respondents that were present at Wave III were included. Accordingly, another set of models is conducted with only respondents who were still present at Wave III and did not move between Waves I and III. It is shown in Table 4 that for these respondents, their ratings of neighborhoods are significantly associated with

baseline depressive symptoms net of individual demographics (B = .127, $p < .001$) and the effect was sizable (β = .129). Social support shows a marginally significant buffering effect (B = -.070, $p = .026$).

Table 4. Unstandardized OLS Coefficients Regressing Wave I Depression Index on the Respondents' Ratings of Neighborhoods, Demographics, Social Support and the Interaction Term for Wave III Respondents Who Did Not Move Between Waves I and III (N = 1396)

	Model 1		Model 2		Model 3		Model 4	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Respondents' Ratings	.158 (.026)	***	.127 (.026)	***	.071 (.025)	**	.070 (.025)	**
Age			-.008 (.002)	***	-.003 (.002)		-.003 (.002)	
White			-.177 (.056)	**	-.175 (.053)	***	-.182 (.053)	***
Male			-.137 (.052)	**	-.194 (.050)	***	-.194 (.050)	***
Married			-.251 (.055)	***	-.258 (.052)	***	-.248 (.052)	***
SES			-.130 (.028)	***	-.129 (.027)	***	-.126 (.027)	***
Social Support					-.413 (.033)	***	-.413 (.033)	***
Respondents' Ratings × Social Support							-.070 (.031)	†
Constant	-.040		1.020		.794		.772	
Adj-R^2	2.5%		9.1%		18%		18.2%	

† $p < .05$, ** $p < .01$, *** $p < .001$
Source: Americans' Changing Lives
Note: Corresponding to Model II in Figure 2.

H1b: In the baseline model, the interviewers' negative ratings of neighborhoods are associated with higher levels of depressive symptoms at Wave I net of individual demographics.

H2b: In the baseline model, social support buffers the association between the interviewers' ratings of neighborhoods and depressive symptoms at Wave I.

Models in Table 5 indicate that poor neighborhood conditions, measured by the interviewers' negative ratings of neighborhoods, are associated with higher levels of baseline depressive symptoms (B = .141, $p < .001$). The interviewers' ratings of neighborhoods account for approximately 4% of the variances in respondents' baseline depressive symptoms.

Table 5. Unstandardized OLS Coefficients Regressing Wave I Depression Index on Interviewers' Ratings of Neighborhoods, Demographics, Social Support and the Interaction Term for Wave I Full Sample (N = 3563)

	Model		Model 2		Model 3		Model 4	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Interviewers' Ratings	.141 (.012)	***	.055 (.013)	***	.041 (.012)	***	.041 (.013)	***
Age			-.008 (.001)	***	-.004 (.001)	***	-.004 (.001)	***
White			-.141 (.038)	***	-.125 (.036)	***	-.125 (.036)	***
Male			-.148 (.035)	***	-.200 (.034)	***	-.200 (.034)	***
Married			-.262 (.036)	***	-.242 (.034)	***	-.242 (.034)	***
SES			-.183 (.021)	***	-.180 (.020)	***	-.180 (.020)	***
Social Support					-.413 (.021)	***	-.413 (.021)	***
Interviewers' Ratings × Social Support							.000 (.014)	
Constant	.110		1.234		.985		.985	
Adj-R^2	3.7%		10.2%		19%		19%	

† $p < .05$, ** $p < .01$, *** $p < .001$
Source: Americans' Changing Lives
Note: Corresponding to Model III in Figure 2.

After controlling for demographics, the interviewers' ratings are still significantly associated with depressive symptoms (B = .055, $p < .001$). Nevertheless, the standardized coefficient drops by 61% [(.193-.075)/.193], so a test of change in standardized coefficients is necessary. As shown in Table 6, the difference between two standardized coefficients is .118. The corresponding z-value is 6.670. It suggests that the difference is statistically significant at .001 level. As a result, the association between the interviewers' ratings of neighborhoods and depression is contingent on demographics, such that hypothesis 1b is only partially supported.

Table 6. Test of Change in Standardized Coefficients of Interviewers' Ratings of Neighborhoods

	Model 1 B (s.e.)	Model 2 β (s.e.)	Difference in β's	z^{Sig}
Interviewer' Ratings	.193 (.012)	.075 (.013)	.118	6.670***

† $p < .05$, ** $p < .01$, *** $p < .001$
Source: Americans' Changing Lives

In Model 4 (Table 5) there is a negative association between social support and depression (B = -.413, $p < .001$), but social support does not buffer the effect of poor neighborhood conditions on depression at all (B = .000, $p = .973$). Hypothesis 2b is not supported.

The same models are conducted with the sample limited to respondents who were present at Wave III and did not move between Waves I and III. The attenuation of demographics on neighborhood effects is clearer in these models. As shown in Table 7, the introduction of demographics into the model makes the effect of interviewers' ratings only marginally significant at .05 level.

Table 7. Unstandardized OLS Coefficients Regressing Wave I Depression Index on Interviewers' Ratings of Neighborhoods, Demographics, Social Support and the Interaction Term for Wave III Respondents Who Did Not Move Between Waves I and III (N = 1396)

	Model 1		Model 2		Model 3		Model 4	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Interviewers' Ratings	.117 (.019)	***	.052 (.021)	†	.040 (.019)	†	.040 (.019)	†
Age			-.008 (.002)	***	-.003 (.002)		-.003 (.002)	
White			-.169 (.057)	**	-.163 (.054)	**	-.162 (.054)	**
Male			-.141 (.052)	**	-.200 (.050)	***	-.199 (.050)	***
Married			-.264 (.055)	***	-.263 (.052)	***	-.264 (.052)	***
SES			-.102 (.030)	***	-.109 (.028)	***	-.109 (.028)	***
Social Support					-.427 (.033)	***	-.425 (.033)	***
Interviewers' Ratings × Social Support							.011 (.024)	
Constant	-.033		.997		.753		.753	
Adj-R^2	2.6%		7.9%		17.8%		17.7%	

† $p < .05$, ** $p < .01$, *** $p < .001$
Source: Americans' Changing Lives
Note: Corresponding to Model IV in Figure 2.

H1c: In the baseline model, both the respondents' and the interviewers' negative ratings of neighborhoods are associated with higher level of depressive symptoms at Wave I net of individual demographics.

Table 8 provides results in which two neighborhood measures are tested together. The gross neighborhood effect accounts for approximately 6% of the variances in

depressive symptoms. Both measures are significantly associated with baseline depressive symptoms in expected directions (B = .164, $p < .001$; B = .114, $p < .001$). Accounting for demographics renders the interviewers' ratings marginally significant (B = .031, $p = .020$), but the effect of the respondents' ratings is sizable and remains significant (B = .156, $p < .001$). This pattern persists after social support is added to the regression equation. Hypothesis 1c is partially supported: the respondents' ratings of neighborhoods work above and beyond individual demographics; the interviewers' ratings of neighborhoods have an effect on depressive symptoms, but the effect is largely attenuated by individual differences in demographics.

Table 8. Unstandardized OLS Coefficients Regressing Wave I Depression Index on the Respondents' and the Interviewers' Ratings of Neighborhoods, Demographics and Social Support for Wave I Full Sample (N =3563)

	Model 1		Model 2		Model 3	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Respondents' Ratings	.164	***	.156	***	.099	***
	(.017)		(.016)		(.016)	
Interviewers' Ratings	.114	***	.031	†	.027	†
	(.012)		(.013)		(.013)	
Age			-.007	***	-.003	**
			(.001)		(.001)	
White			-.125	***	-.117	***
			(.038)		(.036)	
Male			-.139	***	-.192	***
			(.035)		(.034)	
Married			-.244	***	-.231	**
			(.036)		(.034)	
SES			-.195	***	-.188	***
			(.020)		(.019)	
Social Support					-.387	***
					(.021)	
Constant	.111		.874		.561	
Adj-R^2	6.3%		12.4%		19.8%	

† $p < .05$, ** $p < .01$, *** $p < .001$
Source: Americans' Changing Lives
Note: Corresponding to Model V in Figure 2.

For respondents who were still present at Wave III, it is clearer that the effect of objective neighborhood conditions is attenuated by demographics (Table 9). The interviewers' ratings change from significant to marginally significant after controlling for demographics. Other results are generally consistent with those from the models for Wave I full sample.

Table 9. Unstandardized OLS Coefficients Regressing Wave I Depression Index on the Respondents' and the Interviewers' Ratings of Neighborhoods, Demographics, and Social Support for Wave III Respondents Who Did Not Move Between Waves I and III (N =1396)

	Model 1		Model 2		Model 3	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Respondents' Ratings	.136 (.026)	***	.120 (.026)	***	.065 (.025)	**
Interviewers' Ratings	.101 (.019)	***	.038 (.021)	†	-.033 (.020)	†
Age			-.007 (.002)	***	-.003 (.002)	
White			-.153 (.057)	**	-.154 (.054)	**
Male			-.141 (.052)	**	-.198 (.050)	***
Married			-.245 (.055)	***	-.253 (.052)	***
SES			-.113 (.020)	***	-.114 (.028)	***
Social Support					-.411 (.033)	***
Constant	-.672		.552		.505	
Adj-R^2	4.4%		9.2%		18.1%	

† $p < .05$, ** $p < .01$, *** $p < .001$
Source: Americans' Changing Lives
Note: Corresponding to Model VI in Figure 2.

H1d: In the longitudinal model, the respondents' negative ratings of neighborhoods are associated with high level of depressive symptoms at Wave III, net of individual demographics and depressive symptoms at Wave I.

H2c: In the longitudinal model, social support buffers the association between the respondents' ratings of neighborhoods and depressive symptoms at Wave III.

The neighborhood factors considered in baseline models reveal substantial explanatory efficacy for depressive symptoms. However, cross-sectional analysis is not able to exhibit the directions of these associations. Longitudinal models can be used to examine if the respondents' ratings at baseline interview are associated with changes in depressive symptoms over time. This will not settle the question of causality but a significant effect would suggest at least some of the casual direction runs from neighborhoods to depression. In models for Hypothesis 1d, 1e 1f, 2c and 2d, respondents are limited only to those who did not move during the period between Waves I and III. Since the change in depressive scores may be due to the fact of moving or the fact of a change in the type of neighborhood, a change in neighborhood may confound the results if respondents are not limited to those who did not move.

Models in Table 10 use depression at Wave III as the dependent variable to test the main effect of neighborhoods and the buffering effect of social support longitudinally, controlling for demographics and depression at Wave I. As shown in Table 10, the respondents' ratings of neighborhoods are significantly associated with depression at Wave III but only explain 1.2% of the variances in the dependent variable. The significant effect of the respondents' ratings on depression is not changed by introducing demographics into the model (B = .089, $p < .001$). In these two models, the standardized coefficient (not shown in the table) slightly drops by 18% [(.114-.093)/.114] though this is not a statistically significant drop (change in β's = .021, $p = .582$, not shown in the table). Race and SES were significantly associated with depressive symptoms at Wave III (B = -.259, $p < .001$; B = -.119, $p < .001$), and they accordingly produce a noticeable

amount of increment in explained variances (ΔAdj-R^2 = 9.9% - 1.2% = 8.7%). Depressive symptoms at Wave III are not differentiated by age, gender, or marital status. Controlling for depression at Wave I renders the effect of the respondents' ratings insignificant (B = .039, p = .092).

As shown in Table 10, social support is significantly associated with depressive symptoms at Wave III, with or without controlling for depressive symptoms at Wave I (Model 4: B = -.306, p < .001; Model 5:B = -.156, p < .001). However, social support does not buffer the effect of the respondents' ratings of neighborhoods since the interaction term have an unstandardized coefficient of .023 with a p-value of .433 in Model 5 (Table 10).

Table 10. Unstandardized OLS Coefficients Regressing Wave III Depression Index on the Respondents' Ratings of Neighborhoods, Demographics, Social Support, the Interaction Term and Wave I Depression Index for Wave III Respondents Who Did Not Move Between Waves I and III (N = 1396)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Respondents' Ratings	.110	***	.089	***	.039		.048		.022	
	(.026)		(.025)		(.023)		(.025)		(.023)	
Age			-.004		-.001		-.001		.000	
			(.002)		(.002)		(.002)		(.002)	
White			-.259	***	-.188	***	-.257	***	-.192	***
			(.054)		(.049)		(.052)		(.049)	
Male			-.066		-.012		-.109		-.038	
			(.050)		(.046)		(.049)		(.046)	
Married			-.119		-.019		-.124		-.034	
			(.053)		(.049)		(.052)		(.049)	
SES			-.203	***	-.152	***	-.203	***	-.157	***
			(.027)		(.025)		(.027)		(.025)	
Social Support					--		-.306	***	-.156	***
							(.033)		(.033)	
Respondents' Ratings					--		-.003		.023	
× Social Support							(.031)		(.029)	
Depression Index (Wave I)					.398	***			.362	***
					(.024)				(.025)	
Constant	-.156		.823		.417		.655		.375	
Adj-R^2	1.2%		9.9%		25.1%		15.0%		26.3%	

† $p < .05$, ** $p < .01$, *** $p < .001$

Source: Americans' Changing Lives

Note: Corresponding to Model VII in Figure 3.

H1e: In the longitudinal model, the interviewers' negative ratings of neighborhoods are associated with high level of depressive symptoms at Wave III, net of individual demographics and depressive symptoms at Wave I.

H2d: In the longitudinal model, social support buffers the association between interviewers' ratings of neighborhoods and depressive symptoms at Wave III.

As shown in Model 1 (Table 11), the interviewers' ratings of neighborhoods are associated with depressive symptoms at Wave III. Specifically, living in poor neighborhood conditions is associated with higher levels of subsequent depressive symptoms (B = .133, $p < .001$). Notably, the interviewers' ratings of neighborhoods have a greater explanatory efficacy for depression at Wave III (Adj-R^2 = 3.6%), when compared to the respondents' ratings (1.2%) (Table 11, Model 1). Model 2 (Table 11) adds individual demographic variables into the equation. People who were older, white, and were of higher SES at Wave I tended to have lower levels of depression at Wave III. With these adjustments, the coefficient associated with objective neighborhood conditions is reduced by 64%, and is only marginally significant at .05 level (B = .048, $p = .016$). It may suggest the possibility that part of the effect of poor neighborhood conditions on depressive symptoms is derived from the respondents' individual disadvantage (White: B = -.245, $p < .001$; SES: B = -.179, $p < .001$). After controlling for baseline depressive symptoms, the interviewers' ratings of neighborhoods completely lost its significance (B = .039, $p = .137$). Thus, hypothesis1e is partially supported.

Table 11. Unstandardized OLS Coefficients Regressing Wave III Depression Index on the Interviewers' Ratings of Neighborhoods, Demographics, Social Support, the Interaction Term and Wave I Depression Index for Wave III Respondents Who Did Not Move Between Waves I and III (N = 1396)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Interviewers' Ratings	.133	***	.048	†	.027		.039		.025	
	(.018)		(.020)		(.018)		(.019)		(.018)	
Age			-.005	**	-.001		-.001		.000	
			(.002)		(.002)		(.002)		(.002)	
White			-.245	***	-.177	***	-.243	***	-.185	***
			(.055)		(.051)		(.054)		(.050)	
Male			-.071		-.014		-.115		-.043	
			(.051)		(.046)		(.049)		(.046)	
Married			-.126		-.020		-.124		-.029	
			(.053)		(.049)		(.052)		(.049)	
SES			-.179	***	-.138	***	-.183	***	-.144	***
			(.029)		(.026)		(.028)		(.026)	
Social Support					--		-.318	***	-.165	***
							(.033)		(.032)	
Interviewers' Ratings					--		-.019		-.023	
× Social Support							(.024)		(.022)	
Depression Index (Wave I)					.401	***			.361	***
					(.024)				(.025)	
Constant	-.137		.787		.387		.607		.335	
Adj-R^2	3.6%		9.5%		25.1%		15.1%		26.3%	

† $p < .05$, ** $p < .01$, *** $p < .001$

Source: Americans' Changing Lives

Note: Corresponding to Model VIII in Figure 3.

Adding social support and the interaction term into the model does not change the above results (Interviewers' Ratings of Neighborhoods: B = .025, p = .172; white: B = -.185, $p < .001$; SES: B = -.144, $p < .001$). The hypothesized buffering effect of social support (Hypothesis 2d) receives no support in the model (B = -.023, p = .298).

H1f: In the longitudinal model, both the respondents' and the interviewers' negative ratings of neighborhoods are associated with high level of depressive symptoms at Wave III, net of individual demographics, social support, and depressive symptoms at Wave I.

In Model 1(Table 12), the gross neighborhood effect (measured by the joint inclusion of the respondents' and the interviewers' ratings) accounts for 4.2% of the variances in depressive symptom counts at Wave III. This is greater than the explanatory efficacy of either one of the measures. Both measures of the neighborhood are significantly associated with depression at Wave III in Model 1 (B = .082, $p < .001$; B = .123, $p < .001$). This suggests that living in a neighborhood with poor conditions is distressing and the objective conditions are not the only factor influencing individuals' depressive symptoms. The interviewers' ratings have a greater standardized coefficient (β = .178, not shown in the table) than the respondents' ratings do (β = .085, not shown in the table), indicating that objective conditions have more strengths in explaining depression.

Respondents' ratings lose the significance after baseline depressive symptoms are accounted for (B = .024, p = .301), whereas the effect of interviewers' ratings of neighborhood is still significant (B = .116, $p < .001$). These results indicate that the

respondents' rating is a reflection of objective neighborhood conditions, which may further suggest that poor neighborhoods are stressful.

Consistent with results in prior models, the introduction of demographics reduces the standardized coefficient (not shown in the table) associated with the interviewers' ratings of neighborhoods by 69% [(.178-.055)/.178] and renders it insignificant. It suggests that what are depressing about neighborhoods are those things associated with demographics, especially SES. Accounting for social support continues to reduce the standardized coefficient (not shown in the table) associated with the respondents' ratings by half. In all, Hypothesis 1f is partially supported.

Table 12. Unstandardized OLS Coefficients Regressing Wave III Depression Index on, the Respondents' and the Interviewers' Ratings of Neighborhoods, Wave I Depression Index, Demographics, Social Support and the Interaction Term for Wave III Respondents Who Did Not Move Between Waves I and III (N = 1396)

	Model 1		Model 2		Model 3		Model 4	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Respondents' Ratings	.082	***	.024		.035		.018	
	(.026)		(.023)		(.023)		(.023)	
Interviewers' Ratings	.123	***	.080	***	.023		.023	
	(.018)		(.017)		(.018)		(.018)	
Depression Index			.426	***	.397	***	.359	***
(Wave I)			(.023)		(.024)		(.025)	
Age					-.001		.001	
					(.002)		(.002)	
White					-.174	***	-.180	***
					(.051)		(.050)	
Male					-.014		-.041	
					(.046)		(.046)	
Married					-.016		-.028	
					(.049)		(.049)	
SES					-.141	***	-.146	***
					(.0270		(.026)	
Social Support							-.157	***
							(.033)	
Constant	-.738		-.452		.221		.224	
Adj-R^2	4.2%		22.5%		25.1%		26.3%	

† $p < .05$, ** $p < .01$, *** $p < .001$
Source: Americans' Changing Lives
Note: Corresponding to Model IX in Figure 3.

Summary

Cross-sectional analysis indicates a clear association between the respondents' negative ratings of neighborhoods and their depressive symptoms. Individuals who were less satisfied with their neighborhoods tended to have higher depression levels than those who were more satisfied. However, the respondents' negative ratings were not the only factor that influenced individual's depressive symptoms. The objective condition of the neighborhood had an additional effect on depression, but as elaborated above, this effect appeared to be due to individual disadvantage or the fact that poor people were more likely to live in poor neighborhoods. This is supported by findings showing that more than half of the effect of objective neighborhood conditions was attenuated by individual differences in demographics. Social support moderately buffered the effect of the respondents' ratings in the baseline model but did not buffer the effect of the interviewers' ratings or the effect of the respondents' ratings on the change in depressive symptoms across waves.

The pattern associated with the interviewers' ratings of neighborhoods is also observed in longitudinal models. It is found that the interviewers' ratings of neighborhoods exhibited a significant effect on depressive symptoms at Wave III. However, in both baseline and longitudinal models, the significant effect of objective conditions on depression was attenuated by individual demographics. This indicates that the effect of objective conditions of the neighborhood is due to individual economic disadvantage or the cumulative effect of large numbers of disadvantaged individuals disproportionately living in poor neighborhoods. However, there is still the chance that

neighborhood has additional effects on depression, if poor people living in affluent neighborhoods are less depressed than those who are poor but living in disadvantaged neighborhoods. Interactions between objective conditions and race and between objective conditions and SES were tested, but neither interaction terms was significant (not shown in the table), suggesting little support for an independent neighborhood effect. These results do not support the argument that objective neighborhood conditions have effects above and beyond the variations in individual economic and social advantage.

Although the respondents' ratings of neighborhoods at Wave I were significantly associated with depressive symptoms at Wave III, it is premature to conclude that the causal direction runs from the neighborhood to depressive symptoms, as the longitudinal analysis also reveals that the respondents' ratings at Wave I did not account for the changes in depressive symptoms between Waves I and III (Table 10, Model 3). At this point, however, it is also premature to conclude that the association between neighborhood perceptions and depression in baseline and longitudinal models is spurious—driven by the negative cognitive styles, because there is also evidence to support such an association. When tested along with the interviewers' ratings of neighborhoods, the respondents' ratings became insignificant (Table 12), suggesting that objective neighborhood conditions have an effect that are independent from the respondents' negative cognitive styles.

The inconsistent results may be due to several reasons. One of the possibilities is that the research design in the current study may remove a lot of variances in the predictor. Since the neighborhood is conceptualized as a stressor, respondents for

longitudinal analysis are limited to those who did not move. Although casting the data this way helps avoid the potential confounding of neighborhood change and the influence of moving, it, at the same time, reduces variations in neighborhoods. This loss of variations may cause the insignificant association between neighborhoods and change in depression between Waves I and III. Therefore, a post-hoc analysis that explores interaction between moving and the respondents' ratings of neighborhoods will be beneficial for better understanding the results in main analysis.

Post-Hoc Analysis

In order to better interpret the results from the main analysis and to further pursue the effect of moving, a post-hoc analysis is performed. It contains two sets of models. One set of models will only look at respondents who changed their residences. It examines if change in neighborhood perceptions predicts change in depressive symptoms through examining a subgroup of people who changed their places of living during the eight-year period between baseline and follow-up interviews.[13] The other model will more fully explore the interactions between the respondents' ratings and moving by incorporating five dichotomized variables, each of which represents a subgroup of people with their own changes in the respondents' ratings and moving status.

Table 13 shows results that only include people who changed their residencies between Wave I and Wave III to examine if changes in the respondents' ratings of their

[13] The interviewers' ratings of neighborhoods are not available at Wave III, so only the respondents' ratings of neighborhoods will be tested this way.

neighborhoods between Wave I and Wave III predict changes in depressive symptoms between waves, controlling for age, race, gender, marital status, SES, social support, and baseline depressive symptoms. In these models, depression at wave I is entered into the equation as the first step, such that all other coefficients can be interpreted as though the dependent variable was the change in depression from Wave I to Wave III.

Table 13. Unstandardized OLS Coefficients Regressing Wave III Depression Index on Wave I Depression Index, Change in Respondents' Ratings, Demographics and Social Support for Wave III Respondents Who Moved Between Waves I and III (N = 963)

	Model 1		Model 2		Model 3		Model 4	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Depression Index (Wave I)	.487 (.027)	***	.488 (.027)	***	.443 (.028)	***	.411 (.029)	***
Change in Respondents' Ratings[a]			.133 (.021)	***	.126 (.020)	***	.127 (.020)	***
Age					.001 (.002)		.003 (.002)	
White					-.321 (.065)	***	-.318 (.065)	***
Male					.046 (.060)		.027 (.060)	
Married					.107 (.061)		.102 (.060)	
SES					-.136 (.033)	***	-.135 (.032)	***
Social Support							-.154 (.040)	***
Constant	-.171		-.156		.275		.219	
Adj-R^2	24.8%		27.8%		31.3%		32.2%	

† $p < .05$, ** $p < .01$, *** $p < .001$
Source: Americans' Changing Lives
[a] Higher score is equivalent to an increase in dissatisfaction.

As shown in Table 13, for people who changed their places of living, increased levels of dissatisfaction with their neighborhoods are significantly associated with increased levels of depressive symptoms from Wave I to Wave III (B = .133, $p < .001$). The significant association is sustained even after controlling for demographics and

controlling for social support. The coefficient of the change in respondents' ratings does not change much across models (Model 3: B = .126, $p < .001$; Model 4: B = .127, $p < .001$; Table 13). The change in respondents' ratings explains an additional 3% of the variances of depressive symptoms at Wave III, controlling for depressive symptoms at Wave I.

This model provides additional support for the hypothesis in that changes in dissatisfaction with the neighborhood go in the same direction with changes in depressive symptoms. However, it remain unclear how the association and its direction would be for different groups of people with different moving status and different changes in neighborhood perceptions.

Another OLS regression is performed to fully explore the interactions between the respondents' ratings and moving. Five dichotomized variables are created based on whether people moved and whether they become more or less satisfied with their neighborhoods. There are 1) people who did not move and become more satisfied with their neighborhoods, 2) people who did not move and become less satisfied with their neighborhoods, 3) people who moved and become more satisfied with their neighborhoods, 4) people who moved and become less satisfied with their neighborhoods, and 5) people who moved and their ratings of neighborhoods did not change over time. People who did not move and their ratings of neighborhoods did not change either are left as the reference group.[14]

[14] Frequencies of these five variables are shown in Appendix B.

This model uses depression at Wave III as the dependent variable and includes all Wave III respondents. After excluding missing cases listwise, 2,398 respondents are available for analysis. For the first step, depression at Wave I is entered into the equation. Then five dichotomized variables are added. Demographics and social support are controlled in later steps.

It is shown in Model 1 (Table 14) that for people who did not move, neither increase nor decrease in neighborhood satisfaction is significantly associated with change in depressive symptoms between Wave I and Wave III (B = .120, p = .031, B = .017, p = .757). In contrast, people who moved and became more dissatisfied tended to have increased depression levels between waves, and people who moved with decrease in dissatisfaction tended to have decreased depression levels between waves, as compared to those who did not move with unchanged ratings. These two associations are statistically significant (B = .200, p < .001, B = -.158, p = .005). After controlling for demographics and social support, people who moved and became less dissatisfied with their new neighborhoods did not differ in change of depression levels, compared to the reference group since the coefficient was not significant at .01 level (B = -.132, p = .021). Moving to a worse place led to significantly more depression even after controlling for demographics and social support (B = .200, p = .001).

People who moved to a place they liked more became less depressed. However, the underlying SES appears to drive this association, since the addition of SES to the model makes this group no different from those whose residence and neighborhood perceptions were stable across waves.

Table 14. Unstandardized OLS Coefficients Regressing Wave III Depression Index on Wave I Depression Index, Interaction Terms of the Respondents' Ratings and Moving, Demographics and Social Support for Wave III Full Sample (N = 2398)

	Model 1		Model 2		Model 3		Model 4	
	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.	B (s.e.)	Sig.
Depression Index (Wave I)	.469 (.017)	***	.469 (.017)	***	.424 (.018)	***	.387 (.019)	***
Increased dissatisfaction × did not move			.120 (.056)	†	.102 (.055)		.099 (.054)	
Decreased dissatisfaction × did not move			.017 (.054)		-.015 (.053)		-.025 (.052)	
Increased dissatisfaction × moved			.200 (.060)	***	.200 (.060)	***	.200 (.060)	***
Decreased dissatisfaction × moved			-.158 (.057)	**	-.131 (.057)	†	-.132 (.057)	†
No change in dissatisfaction × moved			-.010 (.060)		.035 (.061)		.035 (.060)	
Age					.000 (.001)		.002 (.001)	
White					-.235 (.039)	***	-.235 (.039)	***
Male					.018 (.037)		-.007 (.037)	
Married					.034 (.038)		.026 (.038)	
SES					-.148 (.020)	***	-.151 (.020)	***
Social Support							-.159 (.025)	***
Constant	-.149		-.171		.301		.253	
Adj-R^2	23.4%		24.4%		28%		29.2%	

† $p < .05$, ** $p < .01$, *** $p < .001$

Source: Americans' Changing Lives

Note: Respondents who did not move between Waves I and III and whose ratings of neighborhoods did not change between waves are left out as the reference group.

Summary

From the results of the longitudinal models in the main analysis, I did not reach a conclusion in the associations between the respondents' ratings of neighborhoods and depressive symptoms. Since depressive symptoms at Waves I and III are correlated, it is possible to get a significant association between the respondents' ratings of neighborhoods at Wave I and depression at Wave III in the model (Table 10, Model 2), even if this association is actually spurious.

In order to better understand the main analysis, I conducted the post-hoc analysis looking jointly at the influence of residential relocation and changes in respondents' ratings of their neighborhoods. This is designed to help answer the question of whether negative cognitive styles account for the association between unfavorable ratings of neighborhoods and depressive symptoms. If it is the underlying negative cognitive styles that drive the respondents' depressive symptoms, individuals' depression will be associated with their ratings of neighborhoods regardless of relocation status.

The post-hoc analysis shows that for people who did not change their residences, changes in satisfaction with one's neighborhood were not associated with changes in depression (Table 14, Model 4). The marginal association between increased dissatisfaction and depression among those who did not move appear to be a function of individual SES. Among those who moved, the most robust association was between those who moved to a neighborhood they liked less.

Taken as a whole, these results do not support the argument that the association between neighborhood perceptions and depressive symptoms is spurious. In other words,

negative cognitive styles do not fully account for the association between neighborhoods and depressive symptoms. However it also suggests that other factors, such as reasons motivating residency in a given neighborhood, play an important role in the link between neighborhoods and individual SES.

CHAPTER FOUR

DISCUSSION

As one of several studies of neighborhood effects, the current study is guided by the goal of determining the long-term neighborhood effects on depression and the buffering effect of social support. Although the association between neighborhoods and mental health has garnered considerable attention in recent years, relatively few tests of the link have made use of longitudinal data. The current study has the advantage of allowing a longitudinal examination of how poor neighborhoods result in increased depression levels and how social support buffers neighborhood effects.

An additional purpose is to test an alternative measure of neighborhood effects. Each measure used in prior research—the respondents' ratings of neighborhoods or neighborhood SES—has its advantages and disadvantages. The use of self-reported measures leaves open the potential of reverse causality and the potential that the association between neighborhoods and depression can be attributed to the negative cognitive styles—that people with negative cognitive styles evaluate their neighborhoods negatively and are more vulnerable to be depressed. In order to account for these possibilities, I used a combination of self-reported and interviewer-reported methodology. In the current study neighborhood was assessed by two measures—the respondents' ratings of their neighborhoods and the interviewers' ratings of the respondents' neighborhoods.

The following sections discuss results, limitations, and the implications for future research.

Neighborhood, Social Support and Depression

Neighborhoods are connected to an array of factors such as economic status (Massy, 1990), social class (Wilson, 1987) and violent crime (Sampson et al., 1997). Since these characteristics are all highly related to psychological distress (Aneshensel, 1992), one of the recent concentrations for neighborhood studies is in the mental health consequences, such as depression, of living in disordered or disadvantaged neighborhoods. The processes through which neighborhoods influence individual depressive symptoms can be understood under the stress-appraisal-coping theory, which posits that being exposed to a stressor increases the probability of developing mental illnesses. Poor neighborhoods may result in poor mental health through a number of pathways, some related directly to negative emotions generated by safety concerns in disordered environments, others related to access to psychological resources such as the availability of social support to cope with the stressful environment.

Guided by this theoretical frame, this study examined two effects—the main effect of neighborhood on depression and the buffering effect of social support on depression. Specifically, it was expected that there was a cross-sectional association between neighborhood conditions and depression and this association was not due to depressed people evaluating their neighborhoods negatively. Thus, it was expected that neighborhood conditions would be associated with subsequent depressive symptoms. In

addition, it was hypothesized that adding social support would significantly buffers the neighborhood effects on depression.

In support of these hypotheses, the current study found a cross-sectional association between neighborhoods and depression in a nationally representative sample. As predicted, the respondents' and the interviewers' ratings of neighborhoods were significantly associated with baseline depressive symptoms. The respondents' ratings were consistently significantly associated with depression after demographics were controlled for. The interviewers' ratings were significantly associated with depression but the effect was attenuated by individual demographics. It is the individuals' own SES that drives the association between neighborhood and depression, but it remains unknown whether that is from the individual SES playing a role or the individual SES being a proxy for neighborhood poverty before neighborhood-level measures are available.

Although the current study is consistent with previous studies in that neighborhood has an effect on depression, the exact relationship between neighborhood and mental illnesses is still in debate, because there is a further problem in ascertaining the direction of causation—from unsatisfactory neighborhoods to depression, compared to the causation of the other way—from depression to unsatisfactory neighborhoods. The basic social psychological argument holds that personality may alter the direction of the association between perceptions and mental illnesses, because individuals' "general orientations toward life or characteristic interests and motivations would influence how any given stressful life event was interpret and dealt with and, thereby, the event's ultimate impact on the physiological and biological organism" (Kobasa, 1982: pp. 6). In

this particular case, it is speculated that the significant results found in cross-sectional analysis could be driven by negative cognitive styles. If this were the case, the significant association between neighborhood conditions and depressive symptoms could results from depressed people evaluating their neighborhoods more negatively. This is a particularly important consideration when neighborhood assessments are drawn from respondents self reports. In an effort to address the direction of causality, I used Wave I neighborhood measures to predict the change in depressive symptoms between Waves I and III. In contrary to the hypothesis, the results from longitudinal analysis indicated a lack of association between the respondents' ratings of neighborhoods and subsequent changes in depressive symptoms, suggesting the potential that the neighborhoods—depression link found in cross-sectional analysis may be due to depressed people evaluating their neighborhoods negatively.

However, the current study also provided evidence that the association between the respondents' ratings of neighborhoods and depression was due to more than depressed people evaluating their neighborhoods negatively. This evidence came from evaluations of the interviewers' ratings collected at Wave I. When controlling for the interviewers' ratings, the respondents' ratings were not significantly associated with changes in depression levels (Table 12, Model 2), suggesting that the respondents and the interviewers gave similar evaluations to the same neighborhood conditions. Given the assumption that the negative cognitive styles of the respondents and that of the interviewers' are unlikely to be correlated, it is unlikely that the neighborhood—depression link can be attributed to the underlying negative cognitive styles alone.

There is an additional complexity in the association between neighborhoods and subsequent changes in depression levels across waves in the current study. It was found in the current study that changes in respondents' ratings were associated with changes in depressive symptoms among people who moved between Wave I and Wave III but not among people who did not move. Moreover, respondents who did not move but who reported increased level of dissatisfaction across time did not have significantly higher levels depressive symptoms at Wave III. This also suggests that the association between neighborhood perceptions and depression cannot be attributed to the negative cognitive styles alone.

Therefore, what comes out clearly in this study is that the negative cognitive styles are not the only factor that drives individuals' depressive symptoms. Consistent with the stress-appraisal-coping theory, neighborhoods perceived as undesirable and stressful resulted in increased depression levels. Although there are limitations in using self-reported neighborhood measures, the degree of consistency they showed with measures in other studies suggests that they are valid in assessing neighborhood effects at least to some degree.

With regard to the hypothesized buffering role of social support, results suggest that social support can to some degree buffer the effect of respondents' ratings of neighborhoods, but it did not help buffer the negative effect of interviewers' ratings on depression. This suggests that social support may help with subject elements (respondents') but not objective elements (interviewers' ratings) of the neighborhood effects. In the current study, social support is conceptualized and measured as the quality

of relationships and it showed a marginal significant buffering effect on the respondents' ratings of neighborhoods. It is consistent with the results in Kaniasty and Norris's (1992) and in Ross and Jang's (2000) studies where social support were conceptualized the quality of relationships and showed a buffering effect. The result in the current study supports the argument that whether the buffering effect can be found largely depends on how social support is conceptualized and measured.

In sum, the current study provides some evidence that unsatisfactory, disadvantaged neighborhoods can be detrimental to individuals' mental health in terms of increasing depression levels in a nationally representative population. The relation of respondents' ratings and depression levels exist beyond the contribution of individual characteristics and negative cognitive styles. Furthermore, social support to some extent operates as a buffer against the respondents' negative perceptions of neighborhoods.

Limitations

The current study has several limitations. Most notably, due to limited data, the measures I used to access neighborhoods are not as robust as those available today. In the current study, the respondents' ratings were measured by asking respondents to rate the degree to which they were satisfied with their neighborhoods, and the association between the respondents' ratings and changes in depressive symptoms was not significant. In contrast, Latkin and Curry's (2003) study included a seven-item, three point scale based on the Block Environmental Inventory (Perkins, Meeks, & Taylor. 1992) and they found a significant effect of neighborhood perception on changes in

depression levels using this more robust measure. Although alternative models support that negative cognitive styles are not the only reason for depression, this measure does produce results that are contrary to the initial hypothesis.

Second, so far my results support that individual characteristics, especially SES, drive the association between neighborhoods and depression. However, it is still possible that the attenuated effect of interviewers' ratings is due to the potential that this measure does not capture all dimensions of the neighborhood. In the dataset, the interviewers' ratings only included two questions asking the interviewer to evaluate how well the structures and yards in the respondents' neighborhood were kept. The way that the interview's ratings of neighborhoods was operationalized makes this measure more close to a proxy of individual SES, so it is not surprising to find no effect of neighborhoods controlling for individual SES. For example, one dimension that the interviewers' ratings fail to document is the degree of disorder, which is clearly a neighborhood-level measure rather than a proxy to individual SES. This dimension may produce net effects beyond individual differences because not all poor neighborhoods are physically disordered. Whether the neighborhood has an independent effect above and beyond individual differences is still inconclusive, though my results suggest little neighborhood effect other than that resulting from individual disadvantage.

Third, it remains unclear how long it will take for one to develop depressive symptoms after experienced the stressor. This underscores the necessity of longitudinal analysis. Meanwhile, it is worth considering how long it will take for one to completely cope with the stressful experiences, that is, whether the eight year time interval in current

study is long enough for individuals to completely cope with any symptoms caused by stressful neighborhoods. The significant effect for people who moved (Table 14, Model 4) suggests that time may reduce the depressive effect of neighborhoods. In Latkin and Curry's (2003) study, depressive symptoms were assessed in the nine-month follow-up interview and were found to be significantly influenced by neighborhood perceptions. In current study, there is an eight-year interval between Wave I and Wave III, such that the lack of association between neighborhoods and depressive symptoms at Wave III may simply be because the time interval is long enough for individuals to successfully cope with the stress brought by the unpleasant neighborhood conditions.

Another limitation is that changes in individuals and in neighborhoods were not taken into account in the current study. There is an eight-year time period during the longitudinal analysis. As a result, on one hand, people in the sample aged and might become more used to their environment, which might lead to a decline in levels of dissatisfaction and then a decline in depression, and on the other hand, it is plausible that the neighborhood itself experienced a change during the time period of the longitudinal analysis. The improvement in neighborhoods can lead to more satisfaction, which in turn leads to less depressive symptoms.

Directions for Future Research

Despite these limitations, useful information and patterns found in current study are highly suggestive and contributes to future research in neighborhoods and depression. First, the current study confirms that there is a relationship between neighborhoods and

depression which is not entirely due to the respondents' negative cognitive styles. Assessing the respondents' perceptions of their neighborhoods is still a good way to capture neighborhood variations. Future research needs to apply more reliable and valid measures to assess these perceptions. Second, the effect of objective conditions needs further investigation—the relative importance of objective conditions of the neighborhood and individual SES has yet to be disentangled and the degree of disorder should be one of the factors to be taken into account. One would want to develop an index asking the interviewer to rate on more factors than structures and yards in the surrounding area. If no effect is found using more valid measures, the earlier work that showing significant contextual effects may only because neighborhood SES there were just a proxy to individual differences. Third, although longitudinal analysis can help specify the direction of the association between neighborhoods and depression, future research needs to apply a cross-lag analysis to confirm causality of the relationship. Fourth, timing should be considered in designing future research so that during the time period of longitudinal analysis, change in depressive symptoms is visible. Fifth, future research should examine the causes of changes in neighborhood perceptions. Dividing people into different age categories will help determine whether people become old and at the same time become more used to their environments. Changes in neighborhood conditions can also be tested to see if they are related to mental health consequences. Since the current study does not differentiate types or sources of social support (i.e., support from family and that from friends), a final direction should be to examine the

effect of different types of social support on the association between neighborhoods and depression.

APPENDICES

Appendix A

Items and Scales Included in this Study

CESD-11 Scale of Depressive Symptoms (Radloff, 1977)

Instructions: Please look at page 5 of the yellow booklet where you will find a list of statements describing how people sometimes feel. After each statement, please put an "X" in the answer category that indicates how often you felt that way DURING THE PAST WEEK. (Again, the best answer is usually the one that comes to your mind first, so do not spend too much time on any one statement. (If you prefer, I can read the statements to you.)

1 = Never/Hardly ever
2 = Some of the time
3 = Most of the time

1. I felt depressed
2. I felt that everything I did was an effort.
3. My sleep was restless.
4. I was happy.
5. I felt lonely
6. People were unfriendly
7. I enjoyed life.
8. I did not feel like eating. My appetite was poor.
9. I was sad.
10. I felt that other people disliked me.
11. I could not “get going”.

Respondents’ Ratings of Neighborhoods

How satisfied are you with your neighborhood?

1 = Completely satisfied
2 = Very satisfied
3 = Somewhat satisfied
4 = Not very satisfied
5 = Not at all satisfied

Interviewers’ Ratings of Neighborhoods

1. How well kept are the structures in the neighborhood?

1 = Very well
2 = Mixed –Could use a paint job

3 = Poorly –Need painting and minor repairs
4 = Very poorly-- Dilapidated

2. How well kept and cared for are the yards and/or sidewalks in front of the structures in the neighborhood?

1 = Very well
2 = Fairly well
3 = Poorly
4 = Very poorly

Social Support (House & Kahn, 1985)

1 = A great deal
2 = Quite a bit
3 = Some
4 = A little
5 = Not at all

Spouse Total Support

1. How much does your (husband/wife/partner) make you feel loved and cared for?
2. How much do you feel (he/she) makes too many demands on you?
3. How much is (he/she) willing to listen when you need to talk about your worries or problems?
4. How much is (he/she) critical of you or what you do?

Child Total Support

1. How much (does/do) your (son/daughter/children) make you feel loved and cared for?
2. How much does you feel (he/she/they) (makes/make) too many demands on you?
3. How much (is/are) (he/she/they) willing to listen when you need to talk about your worries or problems?
4. How much (is/are) (he/she/they) critical of you or what you do?

Mother Total Support

1. How much do your (mother/RELATIONSHIP) make you feel loved and cared for?
2. How much do you feel she makes to many demands on you?
3. How much is she willing to listen when you need to talk about worries or problems?
4. How much is she critical of you or what you do?

Father Total Support

1. How much do your (father/RELATIONSHIP) make you feel loved and cared for?
2. How much do you feel he makes to many demands on you?
3. How much is he willing to listen when you need to talk about worries or problems?
4. How much is he critical of you or what you do?

Friend/Relative Total Support

1. On the whole, how much do your friends make you feel loved and cared for?
2. Again, on the average, how much do you feel your friends and other relatives make too many demands on you?
3. How much are these friends and relatives willing to listen when you need to talk about your worries or problems?
4. How much are they critical of you or what you do?

Appendix B

Descriptive Statistics for Post-Hoc Analysis

Frequencies of Five Interaction Terms Between Neighborhood Perceptions and Moving (N = 3617)

		Yes (Freq.)	No (Freq.)
1)	Increased dissatisfaction × did not move	376	3241
2)	Decreased dissatisfaction × did not move	418	3199
3)	Increased dissatisfaction × moved	311	3306
4)	Decreased dissatisfaction × moved	364	3253
5)	No change in dissatisfaction × moved	296	3321
Ref.	No change in dissatisfaction × did not move	602	3015

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