Neighborhood Racial Discrimination and the Development of Major Depression

Daniel W. Russell, Frederick D. Clavél, Carolyn E. Cutrona,
W. Todd Abraham, and Rebecca G. Burzette
Iowa State University

This study examined the impact of neighborhood racial discrimination on the development of major depressive disorder (MDD) in a sample of African American women. Participants were 499 women from Georgia and Iowa with no history of MDD who were followed for 9 to 11 years. Several neighborhood characteristics (community social disorder, community cohesion, and community racism) and individual characteristics (negative life events, financial strain, personal outlook, religious involvement, relationship quality, negative affectivity, and individual experiences of racism) were employed as predictors of whether or not the women met criteria for MDD during this period of time. In a multilevel logistic regression analysis, neighborhood-level discrimination as well as individual-level variables including the number of negative life events, financial strain, and negative affectivity were found to be significant predictors of developing MDD. Analyses of cross-level interactions indicated that the effects of neighborhood-level discrimination were moderated by the quality of individuals' relationships, such that better relationships with others served to lessen the effect of neighborhood discrimination on depression. Implications of these findings for understanding the negative effects of racial discrimination are discussed.

General Scientific Summary
This study suggests that pervasive racial discrimination in the neighborhood people live in renders them more vulnerable to depression. Over a period of 9 to 11 years, African American women who lived in a neighborhood in which many people experienced racial discrimination were more likely to develop the onset of a first episode of major depression than those who lived in neighborhoods in which lower levels of racial discrimination were reported by residents.

Keywords: major depression, neighborhood effects, racial discrimination

Beyond an individual's personal experiences of discrimination, people face additional psychological burdens when living in a neighborhood or community in which such experiences occur frequently in the lives of their friends and neighbors. Perceptions of pervasive racial discrimination may have adverse consequences for the mental health of individuals who live in such neighborhoods, above and beyond their own personal experiences of discrimination (Schmitt, Branscombe, Postmes, & Garcia, 2014).

Racial discrimination involves perceptions of unfair treatment on the basis of one's race. In recent years, a number of meta-analytic reviews have found consistent, significant associations between experiences of perceived discrimination and psychological distress (Lee & Ahn, 2013; Paradies et al., 2015; Pascoe & Smart Richman, 2009; Pieterse, Todd, Neville, & Carter, 2012; Schmitt et al., 2014). Furthermore, experiences of racial discrimination have been related to an increased likelihood of major depressive disorder (MDD) among African Americans and members of other ethnic/racial minority groups (Anglin et al., 2014; Brown et al., 2000; Kessler, Mickelson, & Williams, 1999; McLaughlin, Hatzenbuehler, & Keyes, 2010; Siefert, Bowman, Heflin, Danziger, & Williams, 2000). These effects persist even after adjusting statistically for relevant risk factors including gender, age, socioeconomic status (SES), education level, employment status, and preexisting mental health.

Racism is not experienced simply between individuals—it is also perpetuated at group and societal levels. Because racism is embedded in the culture and institutions of our society, perceptions of racial discrimination at the level of the environmental context can occur independent of the individual's own experiences with discrimination (Williams & Mohammed, 2009).

Daniel W. Russell, Department of Human Development & Family Studies, Iowa State University; Frederick D. Clavél and Carolyn E. Cutrona, Department of Psychology, Iowa State University; W. Todd Abraham, School of Education, Iowa State University; Rebecca G. Burzette, Veterinary Medicine Administration, Iowa State University.

Correspondence concerning this article should be addressed to Daniel W. Russell, Department of Human Development and Family Studies, Iowa State University, Palmer Building, 2222 Osborn Drive, Ames, IA 50011-1084. E-mail: drussell@iastate.edu

The larger contexts in which people live differ in the pervasiveness of racism and racially based discrimination (Hunt, Wise, Jipguep, Cozier, & Rosenberg, 2007; Seaton & Yip, 2009; Simons et al., 2002). In the current study, we examine the association of neighborhood-level racial discrimination with the onset of major depression among African American women over an extended period of time. Research has shown that among major American racial and ethnic groups, African Americans are the most likely to experience incidents of racism (Pieterse et al., 2012). Racism has been implicated as a stressor that contributes to the widespread health disparities between African Americans and European Americans (Williams & Mohammed, 2009). Thus, it is important to understand the dynamics of racism at the neighborhood- and individual-levels in the mental and physical health outcomes of African Americans

How Neighborhood Racial Discrimination Affects Mental Health

Discrimination can limit access to valued resources, including jobs, work promotions, high-quality housing, and educational opportunities, all of which engender a perceived lack of control, frustration, and potential hopelessness (Schmitt et al., 2014). Beyond the direct effects of resource deprivation, perceived discriminatory treatment that is attributed to race communicates that one's racial group is devalued by the larger society (Schmitt & Branscombe, 2002). Not only is individual identity important, but the acceptance and value of one's group identity is also important to well-being (Tajfel & Turner, 1979). Thus, we hypothesize that not only individually experienced discrimination but also discrimination experienced by others in one's community has the potential to be detrimental to one's well-being.

Some debate has occurred regarding the relative severity of the mental health consequences that follow perceived discrimination, depending on whether it is perceived to be isolated (limited to the current actor and circumstances) or pervasive (systemic, likely to occur frequently and across contexts). Although isolated discrimination may be more likely to foster internal attributions of fault or deficiency than pervasive discrimination (Crocker & Major, 1989), discrimination that is perceived as pervasive is likely to be viewed as less avoidable, in that it is present across multiple contexts and across time, and therefore more likely to undermine feelings of control (Schmitt & Branscombe, 2002) and increase risk for depression (Abramson, Metalsky, & Alloy, 1989). In a meta-analysis of experimental studies that manipulated the perceived pervasiveness of discriminatory treatment, high pervasiveness was more damaging to well-being than low pervasiveness (Schmitt et al., 2014). Thus, we predicted that individuals who reside in neighborhoods that are perceived as racist by a large number of residents would be more severely affected psychologically than those who reside in neighborhoods that are perceived as racist by a small number of residents, even if the individual's personal experiences of discrimination are infrequent.

Neighborhoods and Mental Health

Neighborhood-level effects are evaluated with the neighborhood as the unit of analysis, using archival (e.g., U.S. Census) data or aggregated reports of individuals living in a neighborhood. Conceptually, neighborhood-level effects reflect the way in which life contexts affect the experiences and well-being of individuals, above and beyond the effects of their unique personal experiences. A number of studies in recent years have examined the effect of neighborhood factors on individual mental health outcomes. One of the most consistent findings is an association between neighborhood social disorder (e.g., crime, graffiti, and drug use) and symptoms of depression and anxiety among both adolescents and adults (Aneshensel & Sucoff, 1996; Cutrona, Russell, Hessling, Brown, & Murry, 2000; Ross, 2000).

A single study has explicitly examined the effects of neighborhood-level discrimination on mental health. In a cross-sectional study employing data from the children of the present participants, Simons and colleagues (2002) examined predictors of depressive symptoms among children 10 to 12 years of age as a function of both individual and neighborhood-level factors. This study demonstrated that the neighborhood-level prevalence of racial discrimination was a significant predictor of depressive symptoms in African American youth—above and beyond the effects of individual experiences of racial discrimination and other known correlates of depression including uninvolved parenting and criminal victimization. The authors concluded that merely witnessing incidents of discrimination against one's racial group can have an effect on the well-being of children, and living in a racist neighborhood can threaten a child's mental health even when he or she has not been the actual target of such incidents. To our knowledge, no other studies have examined the effect of neighborhood-level racial discrimination on individual psychological outcomes, and none have addressed the direct link between neighborhood-level racism and diagnosable disorders.

Neighborhood characteristics may interact with other variables in the prediction of mental health outcomes. We found that neighborhood-level social disorder intensified the effects of both positive and negative personal characteristics on distress (Cutrona et al., 2000). An extension of this research found that neighborhood-level social disorder increased susceptibility to major depression following negative life events (Cutrona et al., 2005). The current study extends the investigation of neighborhood-level influences on mental health to include neighborhood-level racial discrimination and potential interactions between discrimination and other risk and resilience factors.

The Current Study

We did not consider the effects of neighborhood-level racial discrimination in isolation, but in the context of a set of individual-level and neighborhood-level risk and resource variables that previous researchers have identified as important to the well-being of African American women (e.g., Dressler, 1991; Neighbors & Jackson, 1996). Individual-level risk variables included negative life events, economic strain, and dispositional negative affectivity, as well as individual reports of racism. Individual-level resource variables included having a positive outlook (perceived mastery and optimism), religious involvement, and good relationship quality (high level of social support and low relationship burden). At the neighborhood level, we also included both risk and resource variables, including community social disorder (crime and dilapidation) and community cohesion (neighbors know and help each other). We also included percent African American residents, which has been shown to correlate negatively with neighborhood

racism (English, Lambert, Evans, & Zonderman, 2014) but positively with neighborhood disadvantage and disorder (i.e., the "ethnic density" effect; Halpern & Nazroo, 2000); racial density has also been found to be related to level of depression among African Americans (English et al., 2014; Mair et al., 2010). Testing the association between neighborhood-level racism and the onset of major depression in the context of this extensive set of control variables provided a rigorous test of the unique contributions of neighborhood-level racism to mental health.

In examining the effect of individual and neighborhood racism on major depression we conducted a prospective analysis focused on the development of MDD. Previous studies of discrimination and major depression have been largely cross-sectional. The present analyses were limited to participants who did not meet criteria for current or lifetime MDD at the time of the initial interviews. Our analyses therefore focused on whether or not individual or neighborhood discrimination could predict the initial onset of MDD over the subsequent 9 to 11 years.

Method

Participants

Participants were 695 African American women, all of whom were the primary caregiver (PC) for a 10- to 12-year-old African American child when the study began. They were participating in a large-scale longitudinal study of African American children and their families, the Family and Community Health Study (FACHS). This study began in 1997 and is still ongoing, with participants being interviewed every 2 to 3 years. On average the PCs were 37 years of age when the study began in 1997 (range: 25 to 80 years). Most (90.4%) of the participants were the child's biological mother; 5.5% were the child's grandmother. The remaining 4% of the caregivers were other relatives, foster or adoptive parents, or stepparents.

Sampling Strategy

A central goal of the larger study was to investigate the effects of neighborhood characteristics on the functioning of adults and children. As noted previously (Cutrona et al., 2000), we made an effort to recruit families from neighborhoods that varied on economic level (i.e., percent of families with children living below the poverty line). In selecting neighborhoods from which to draw the sample we examined neighborhood characteristics at the level of Block Groups (BGs), which are clusters of blocks within a census tract. On the basis of 1990 census data, BGs were identified in both Iowa and Georgia in which the proportion of African American families was large enough to make recruitment economically practical (10% or higher) and in which the proportion of families with children living below the poverty line varied widely.

Recruitment strategies differed in Georgia and Iowa. BGs in northeast Georgia that excluded inner-city Atlanta and met the criteria for racial composition and extent of poverty were selected. Within each BG, community members who agreed to serve as liaisons between the University of Georgia researchers and neighborhood residents were identified. They compiled rosters of children within each BG who met the sampling criteria. Families were then randomly selected from these rosters and contacted to deter-

mine their interest in participating in the research project. Families who declined participation were removed from the rosters, and other families were randomly selected until the required number of families from each BG had been recruited.

In Iowa we first identified BGs that met the criteria for percent African American residents, all of which were in two urban areas: Waterloo, with a population of 65,000, and Des Moines, with a population of 193,000. Families with African American children between the ages of 10 and 12 were identified through the public schools and randomly selected to participate in the study.

Respondents were reimbursed $100 for each wave of interviews they completed for the study. Across census tracts the recruitment of eligible families ranged from 61% to 68% and did not vary significantly by site. Our recruitment rate was similar to that achieved in the National Survey of Black Americans (Jackson, 1991), which recruited a national probability sample of African American adults.

Interview Procedure

A wide range of questionnaires were administered to participants. The current study included variables relevant to neighborhood quality, stressful life events, personal characteristics, social support, participation in religious activities, and clinical depression. Measures were administered via computer-assisted personal interviews (CAPI). Interview questions appeared in sequence on the computer screen and were read aloud to the participant, who could also see the screen. Interviewers entered responses into the computer immediately following each question.

All interviewers were African American. Most resided in or near the communities where the study was conducted. Interviews were conducted in participants' homes or, if the family preferred, in a convenient location near their home (e.g., library, school, church).

Creation of Neighborhood Clusters for Multilevel Analyses

The families in our sample were nested within 272 BGs. Experts in hierarchical linear modeling typically recommend a minimum of 15 participants per group for multilevel analyses (Bryk & Raudenbush, 1992). Although six of the BGs represented in our sample contained 15 or more families, most contained fewer than five. Thus, there were not enough families within most of the BGs to allow for hierarchical linear modeling of community contextual effects. We addressed this problem by using cluster analysis to combine geographically proximal BGs with similar socioeconomic characteristics into larger community contexts.

We used five variables from the 2000 census to perform the cluster analysis: average per capita income (reverse scored), proportion of female-headed households, proportion of persons on public assistance, proportion of households below the poverty level, and proportion of unemployed men. Previous studies have used some combination of these variables to assess community SES (Sampson, Raudenbush, & Earls, 1997; Sucoff & Upchurch, 1998), and an exploratory factor analysis indicated that these variables loaded on a single factor for the BGs in our sample. We performed the cluster analysis using Ward's minimum-variance method, which is available within the SPSS Cluster program. This method tends to join clusters with a small number of observations and produce clusters with roughly the same number of observations.

The cluster analysis was performed separately for various geographic areas within Iowa and Georgia. The city of Des Moines, for example, was divided into four sectors, and a cluster analysis was completed for the BGs within each of the sectors. This approach was designed to identify clusters of BGs that were close to one another geographically as well as similar in socioeconomic circumstances.

Our analysis identified 21 clusters in Iowa and 19 in Georgia, for a total of 40 clusters. Families who were in clusters that included fewer than 11 families were reassigned to other clusters that were similar on the variables of interest. In our sample of African American primary caregivers, the number of study families in a cluster ranged from 11 to 47, although most clusters ($N = 30$) contained between 15 and 30 families. The BGs in a cluster were not always contiguous. Therefore, a cluster did not represent a neighborhood in the usual sense of the term. Rather, each cluster consisted of a collection of BGs or neighborhoods of comparable SES that shared a similar location within a particular city, town, or rural area. Thus, the neighborhoods within a cluster shared a common set of socioeconomic and geographic circumstances. Given these commonalities, the study families assigned to a particular cluster were considered to be living within similar community contexts.

Neighborhood-Level Measures

Three indices of functional neighborhood quality were computed on the basis of respondents' answers to questions regarding their neighborhood. *Community disorder* combined responses from two scales developed for this project: Community Dilapidation and Community Deviance. The Community Dilapidation Scale consisted of five items assessing facets of the neighborhood such as places for children to play, presence of graffiti, and vacant or deserted buildings. The Community Deviance Scale consisted of four items regarding deviant or antisocial behavior in the neighborhood, such as drinking in public, selling or using drugs, and gang activities. Scores on these two measures were standardized and added together to form an index of community disorder. Using O'Brien's (1990) method for computing the reliability of aggregate-level variables on the basis of individual-level ratings (i.e., interrater agreement), we found the reliability was .79.

Community cohesion was measured using the Social Cohesion and Trust Scale developed by Sampson and colleagues (1997). An additional 10 items written for this project were also included in the measure. These new items assessed such factors as (a) neighbors get together to deal with local problems, (b) there are adults in the neighborhood children can look up to, and (c) people do not get along (reverse scored). Interrater agreement among neighborhood residents was .69.

Community racism was assessed by asking respondents how often they had experienced 13 different types of racially based discrimination. These items were drawn from the Schedule of Racist Events (Landrine & Klonoff, 1996), a measure that is commonly used in the discrimination literature (Pascoe & Smart Richman, 2009; Williams, Neighbors, & Jackson, 2003). An example of one event is, "How often has someone said something insulting to you just because you are African American?" Responses to the items ranged from 1 (*never*) to 4 (*several times*). Interrater agreement among neighborhood residents was .84.

The community disorder, cohesion, and racism scales were aggregated at the level of the neighborhood clusters. The mean for each variable was computed for all respondents who resided within each cluster. For the community disorder and cohesion measures these aggregate-level values were used in the analyses rather than participants' individual assessments of their neighborhood. Both individual- and aggregate-level values were analyzed for the racism variable.

We also employed state of residence (Iowa vs. Georgia) and the percent of African American residents in each neighborhood as control variables. Preliminary analyses indicated that the level of discrimination reported by participants differed significantly between the two states and, as noted above, previous studies have indicated that the proportion of African American residents is related to both the experience of discrimination and depression.

Individual-Level Demographic Characteristics

Demographic variables included participant age, education, and marital status. Although it would have been desirable to include income as a demographic variable, 12% of participants refused to answer some or all of the income questions. Analyses limited to cases that did report household income indicated that it was not a significant predictor after controlling for the other predictor variables. Rather than imputing the missing values, we chose to rely on education as an index of SES.

Individual-Level Psychosocial Variables

Individual-level predictor variables included measures of various types of life events and chronic stressors, relationship quality, attitudes toward the future, religiosity, and personality characteristics. In previous analyses of data from the Wave 1 interviews we created several composite measures based on an exploratory factor analysis of the individual-level measures (Cutrona et al., 2000). One measure, labeled *Outlook*, was based on measures of perceived control and optimism. Perceived control was assessed with the 7-item Mastery Scale developed by Pearlin, Lieberman, Menaghan, and Mullan (1981). We assessed optimism about the future with the Life Orientation Test (LOT; Scheier & Carver, 1985). Using Nunnally's (1978) formula for the reliability of a linear combination of measures, we found that reliability of the composite Personal Outlook measure was .81. We administered the Negative Temperament subscale of Clark and Watson's (1995) Brief Temperament Survey to assess *Negative Affectivity*. A sample item is, "Little things upset me too much." Coefficient alpha was .85 for this measure.

Religious beliefs and participation in church activities are an important aspect of coping among African American adults (Dressler, 1991). Our *Religious Involvement* measure tapped both the importance of religious beliefs in daily life (2 items) and frequency of participation in church-related events (5 items). We found that the reliability of this composite measure was .91. The composite measure labeled *Relationship Quality* consisted of two measures: Perceived social support from network members and perceived conflict and burden imposed by network members. We assessed perceived social support from key members of the social network using a scale adapted from Cohen and Hoberman (1983). Two items tapped perceived emotional support and one item assessed perceived tangible support.

These three items were asked regarding each of three persons: spouse/romantic partner, closest friend, and closest relative. We assessed perceived burden and conflict with each key network member using two items. After reversing responses to the negative burden and conflict items, the reliability of the composite relationship quality measure was .78.

Three measures of stress experienced by the participants were employed in the analyses. First, we used a measure of *Negative Life Events* developed by Conger and Elder (1994) that assessed the number of relatively severe life events participants had experienced during the previous 12 months based on a 29-item checklist that included events such as criminal victimization, serious illness, or injury to self or an immediate family member. Second, a measure labeled *Financial Strain* was created that assessed chronic and acute financial problems using a set of 32 items developed by Conger and Elder (1994). These items tap specific needs that cannot be met because of financial hardship (e.g., not enough money to buy the food we need), the general perception that financial resources are insufficient, specific ways the family has tried to economize to lessen their financial problems (e.g., reduced or eliminated medical insurance because of financial need), and specific negative financial events experienced during the previous 12 months (e.g., cut in wages, laid off from work). Coefficient alpha for this measure was .88.

As noted above, we assessed the core concept of experiences of racism with the Schedule of Racist Events (Landrine & Klonoff, 1996). We included participants' individual scores in our regression equations, along with the neighborhood-level scores. This allowed us to compare the effects of community racism and the individual's own experience of racism on the development of depression. Coefficient alpha of this measure at the individual level was .92.

Depression Diagnosis

Participants were administered a structured psychiatric diagnostic interview, the University of Michigan Composite International Diagnostic Instrument (UM–CIDI; Kessler, 1991), at the initial Wave 1 interviews and during the Wave 2 through 5 interviews. The UM–CIDI was designed for administration by lay interviewers in large scale community studies and is a modification of the National Institute of Mental Health Diagnostic Interview Schedule (DIS; Robins, Helzer, Croughan, Williams, & Spitzer, 1981). The UM–CIDI was developed for the National Institute of Mental Health National Comorbidity Study and subsequently modified to yield *DSM–IV* (*Diagnostic and Statistical Manual of Mental Disorders*, 4th ed.; American Psychiatric Association, 1994) diagnoses. A variety of studies support the validity of the diagnostic classifications rendered by the UM-CIDI (Kessler et al., 1994, 1998; Wittchen, Kessler, Zhao, & Abelson, 1995; Wittchen, Zhao, Abelson, Abelson, & Kessler, 1996).

As noted above, the entire interview, including the diagnostic interview, was administered via computer-assisted personal interviewing (CAPI). All questions were preprogrammed into a laptop computer. The diagnostic interview is quite complex in that if a respondent does not meet a key criterion for a specific disorder (e.g., the mood/loss of interest criterion for major depression), the rest of the questions regarding symptoms of that disorder are skipped. Because the skip patterns are preprogrammed contingent on the respondent's answers, interviewer error in decisions concerning which questions to administer is eliminated.

The UM-CIDI yields life-time, 6-month, and current diagnoses. In addition, it is possible to date the onset of the most recent episode. Using these data, we classified participants in terms of whether or not they met *DSM–IV* criteria for current or life-time depression at the Wave 1 interviews. We subsequently classified participants as meeting criteria for current depression based on their responses during the Wave 2 through 5 interviews.

Data Analyses

We conducted a multilevel logistic regression analysis using the Generalized Linear Mixed Model procedure (PROC GLIMMIX) that is available in the SAS statistical software (Version 9.4). In addition to permitting the simultaneous examination of both individual-level and neighborhood-level predictors of the dependent variable, this procedure also corrects for nonindependence of the observations in testing the effects of the individual-level variables on the dependent variable. All individual-level variables were group mean centered prior to analysis, to remove the influence of any mean differences between the neighborhoods on the results for these predictor variables (see discussion by Enders & Tofighi, 2007).

Results

Sample Characteristics

As noted above the average age of the participants was approximately 37 years when the study began in 1997, and nearly all of the participants were the biological mother of the target child. On average the women had completed 12.5 years of education, with 81% having received a high school diploma. Thirty-four percent of the women reported being married. The sample was nearly equally divided between residents of Georgia (53%) and Iowa (47%).

Preliminary Analyses

The goal of the analyses was to examine the ability of community racism to predict the development of clinical depression among participants over time. To ensure that the results were not affected by current or previous depression we first eliminated from the analysis participants who met criteria for major depression at the time of the Wave 1 interviews or who reported a history of major depression. This eliminated the possibility that depressed individuals were more likely to either move to communities where levels of discrimination are greater or were less likely to leave such areas. The dependent variable in these analyses was whether or not the individual became clinically depressed during the 9 to 11 years following the Wave 1 interviews.

Current or previous history of major depression was reported by 99 participants at the time of the Wave 1 interviews (14.2%). Table 1 presents the results of comparisons between participants who did and did not report either current or past depression at the Wave 1 interview. A greater number of stressful life events, more financial problems, experiencing racism more frequently, having a more negative outlook, and higher levels of negative affectivity were reported by individuals who were classified as currently or previously depressed at the time of the Wave 1 interviews. Although not

Table 1
Comparisons of Depressed and Nondepressed Participants at Wave 1

Variable	Depressed (N = 99) Mean (SD)	Nondepressed (N = 596) Mean (SD)	t	p
Age	35.71 (5.81)	36.88 (8.19)	−1.37	.17
Education	12.77 (2.23)	12.48 (2.21)	1.19	.23
Negative life events	3.92 (3.35)	2.34 (2.24)	6.00	<.001
Financial strain	.32 (.88)	−.02 (.73)	4.14	<.001
Personal outlook	2.89 (.44)	3.01 (.35)	−2.87	.004
Religious involvement	2.45 (.52)	2.45 (.54)	.02	.99
Relationship quality	.57 (.32)	.62 (.30)	−1.41	.16
Negative affectivity	.46 (.30)	.29 (.24)	6.22	<.001
Individual racism	2.44 (.72)	1.98 (.71)	6.01	<.001

shown in the table, the two groups did not differ in the likelihood of being married.

Subsequent analyses included only participants who did not report current or prior history of major depression at the time of the Wave 1 interviews. One problem that arose in conducting the analyses involved individuals who were not depressed at the time of the Wave 2 through Wave 4 interviews but did not participate in the Wave 5 interviews. As a consequence, it is unclear whether these women became depressed during the time period being examined. This group included 97 participants (16.3% of the sample).[1] Analyses were conducted to examine whether or not these individuals differed from the participants with complete data on the variables that were assessed during the Wave 1 interviews. The results indicated that the two groups of participants did not differ significantly on any of these variables. Therefore, it appears that the exclusion of these cases from the analyses did not bias the sample, at least in terms of the variables that were employed as predictors of depression from the Wave 1 interviews. Subsequent analyses were limited to the remaining 499 participants.

Symptoms meeting the criteria for major depression were reported by 18% of the women over the subsequent 9- to 11-year period between the Wave 1 and Wave 5 interviews. The proportion of residents from the 40 neighborhoods who reported being depressed ranged from 0% to 63% during this time period. Analyses were conducted to examine the correlations between neighborhood characteristics and the rate of major depression in each neighborhood. The only neighborhood characteristic that was significantly related to the development of major depression was neighborhood racism (r = .46), indicating that the level of racism in the neighborhood reported at Wave 1 accounted for 21% of the variation in the rate of depression at the neighborhood level over the next 9 to 11 years.

Table 2 presents the point-biserial correlations between the individual-level predictor variables and whether or not the individual became clinically depressed over the subsequent 9- to 11-year period of time. As expected, the development of depression was significantly related to the number of negative life events and level of financial problems reported by participants at the time of the Wave 1 interview, as well as their level of negative affectivity. The quality of their interpersonal relationships was negatively related to subsequent depression. Finally, there was a significant relationship between the woman's personal experiences of discrimination and whether or not she was subsequently found to meet criteria for clinical depression.

Multilevel Regression Analyses

Results of the multilevel regression analysis employing the Wave 1 neighborhood-level and individual-level variables as predictors of subsequent clinical depression are presented in Table 3. As in the univariate analyses, among neighborhood-level variables only neighborhood racism was a significant predictor of the rate of depression at the neighborhood level, with increasing levels of racism predicting higher rates of depression. At the individual-level, the number of negative life events, financial problems, and a higher level of negative affectivity were significant predictors of whether the individual became depressed over the subsequent 9- to 11-year period of time. The odds ratios shown in Table 3 indicate that an increase of one life event was associated with a 22% increase in the likelihood of becoming depressed, whereas a one standard deviation increase in financial strain resulted in a 41% increase in the likelihood of becoming depressed and a one standard deviation increase in negative affectivity resulted in a 45% increase in the likelihood of becoming depressed.

Although the experience of racism by the individual was associated with an increased likelihood of becoming depressed in the univariate analyses, that variable was no longer statistically significant after controlling for the effects of neighborhood racism and the other individual-level predictor variables. Importantly, however, neighborhood racism remained a significant predictor of the rate of depression at the neighborhood level after controlling for the other community and individual predictor variables. These results indicate that the effect of community context on the development of depression cannot be completely accounted for by the effects of individual experiences of discrimination or other individual characteristics on depression.

A form of sensitivity analysis was conducted to evaluate how the loss of participants from the sample due to nonparticipation in Wave 5 may have affected the results. For nonparticipating individuals who were still alive at the time of the Wave 5 interview (N = 85) we conducted analyses assuming either (a) none of them would have met criteria for MDD at the time of the Wave 5 interviews, or (b) all of them would have met criteria for MDD at

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[1] Of the 97 participants who did not participate in the Wave 5 interviews, 12 were deceased, 1 was incarcerated, 31 refused to participate when contacted, and the remaining 53 participants could not be located by the interviewers. It should be noted that some of these latter individuals continued to participate in the study once they were located; indeed, 31 of them participated in the Wave 6 interviews.

Table 2

Correlations Between the Individual Variables and Development of Clinical Depression

Individual variable	Depressed?
Age	−.02
Education	.00
Married	.02
Negative life events	.25**
Financial strain	.21**
Personal outlook	−.04
Religious involvement	.00
Relationship quality	−.12*
Negative affectivity	.16**
Individual racism	.14*

Note. $N = 499$. For the continuous measures these are the point-biserial correlations with the dichotomous depression variable; for the dichotomous marital status variable this is the phi coefficient.
* $p < .01$.   ** $p < .001$.

the time of the Wave 5 interviews. In the first case neighborhood racism remained a statistically significant predictor ($b = 1.25$, $SE = .61$, $t(34) = 2.04$, $p < .05$) whereas in the second case neighborhood racism was a marginally significant predictor ($b = .89$, $SE = .48$, $t(34) = 1.85$, $p = .07$). These results suggest that our substantive conclusions regarding the impact of neighborhood racism on the development of MDD were not altered by not being able to include these participants in the analyses.

We also examined whether or not the effect of neighborhood racism as assessed at Wave 1 varied in its impact on the development of MDD over time by conducting a discrete time survival analysis. The results indicated that the impact of neighborhood racism on the hazard rate (the proportion of participants who developed MDD at each wave if they had not shown evidence of MDD at a prior wave) was statistically significant and did not interact with time (i.e., wave of assessment; analysis not shown). It therefore appears that the effect of the level of neighborhood racism at Wave 1 on the development of MDD did not change across the five waves of interviews.

Interactions Between Neighborhood Racism and Individual Characteristics

The next set of analyses examined whether or not characteristics of the individual moderated the effects of neighborhood racism on the likelihood of becoming depressed. This included both factors that might tend to enhance the effect of neighborhood racism on depression, such as the individual's own experiences of racism or other stressful aspects of their lives, and factors that might serve to lessen the impact of neighborhood racism, such as the individual's outlook, religious involvement, or interpersonal relationships. As recommended by Kreft and de Leeuw (1998) we tested each interaction in isolation to lessen the effect of multicollinearity on the results.

The results of these analyses indicated that only one interaction, between neighborhood racism and the quality of the individual's interpersonal relationships, was statistically significant, $b = −.77$, $t(448) = −2.19$, $p = .03$. The nature of this interaction was consistent with expectations: Higher quality relationships with others served to decrease the negative effects of neighborhood

discrimination on the development of depression. Analyses of the simple effects of the interaction indicated that the effect of neighborhood racism on depression was statistically significant for individuals who reported poor relationships with others (i.e., 1 *SD* below the mean; $b = 2.10$, $t(34) = 2.96$, $p = .006$) whereas the relationship between neighborhood racism and subsequent depression was nonsignificant for individuals who reported better relationships with others (i.e., 1 *SD* above the mean; $b = .92$, $t(34) = 1.02$, $p = .21$).

The Impact of Moving From the Neighborhood

One issue that arises in examining the effect of neighborhood racism on the development of depression involves moving from the neighborhood. Not residing in the neighborhood for the entire period of time may serve to lessen the effect of neighborhood racism on the individual. This would particularly be true if the individual moved to another neighborhood where there were lower levels of racism.

During the 9 to 11 years following the initial wave of interviews, 50% of the 499 participants moved from their neighborhood. A multilevel regression analysis was conducted to test whether or not moving from the neighborhood served to lessen the effect of neighborhood racism on the development of depression. The results indicated that moving did not predict the development of depression ($b = −.15$, $t(446) = −.54$, $p = .59$), nor was there a significant interaction between neighborhood racism and moving in the prediction of depression ($b = .03$, $t(446) = .05$, $p = .96$). We also examined whether or not the duration of residence in the neighborhood had an effect, by determining whether or not the amount of time they were in the neighborhood following the first wave of interviews before moving moderated the influence of neighborhood racism on subsequent depression. The results indicated that the amount of time in the neighborhood did not predict

Table 3

Results of Multilevel Analysis Predicting Development of Clinical Depression

Predictor	df	b	SE	t	p	Odds ratios
State (1 = Iowa)	34	−.47	.46	−1.02	.32	.62
% African American	34	.19	.65	.29	.78	1.21
Community disorder	34	.57	.67	.85	.40	1.76
Community cohesion	34	.75	.94	.80	.43	2.11
Community racism	34	1.59	.62	2.55	.02	4.88
Age	449	−.07	.15	−.45	.65	.94
Education	449	−.09	.15	−.58	.56	.92
Married	449	.31	.28	1.09	.28	1.36
Negative life events	449	.20	.06	3.47	.001	1.22
Financial strain	449	.34	.13	2.63	.009	1.41
Personal outlook	449	.09	.15	.57	.57	1.09
Religious involvement	449	−.01	.14	−.06	.95	.99
Relationship quality	449	−.14	.14	−.98	.33	.87
Negative affectivity	449	.37	.14	2.58	.01	1.45
Individual racism	449	.18	.15	1.20	.23	1.20

Note. The continuous individual-level variables (i.e., age, education, financial strain, outlook, religious involvement, relationship quality, and negative affectivity) were group mean centered prior to the analysis after converting the measures to *z* scores. Negative Life Events was a count of the number of life events reported by the participant prior to group mean centering.

the development of depression ($b = .03$, $t(446) = .72$, $p = .47$), nor was there a significant interaction between neighborhood racism and the duration of residence in the prediction of depression ($b = -.10$, $t(446) = -1.15$, $p = .25$). Finally, we examined whether the level of racism experienced by the participant in the new neighborhood, relative to the neighborhood they resided in at Wave 1, influenced the likelihood of becoming depressed. We created a variable that reflected the change in racism reported by the individual before and after moving to the new neighborhood. So, for example, if a participant moved to a new neighborhood between Waves 3 and 4 this measure would reflect the level of racism reported by her at Wave 4 (in the new neighborhood) minus the level of racism she reported experiencing at Wave 3 (in the old neighborhood). This change in racism score did not predict the likelihood of becoming depressed ($b = .02$, $t(435) = .64$, $p = .52$), nor was there a significant interaction between neighborhood racism and the change in the individual experience of racism after moving in the development of depression ($b = .06$, $t(435) = 1.05$, $p = .30$). Indeed, when we examined participants' ratings of the level of discrimination in the neighborhood they moved to, the average change was a decline of $-.25$; this corresponds to a Cohen's d of .03. It does not appear that these individuals were moving to neighborhoods that were very different in terms of discrimination from their original neighborhood. In summary, moving from the neighborhood they resided in at Wave 1 did not appear to have an influence on the development of depression or moderate the influence of neighborhood racism on depression.

Discussion

The prevalence of racial discrimination varies widely from one neighborhood to the next (Hunt et al., 2007; Seaton & Yip, 2009). We hypothesized that the experience of living in a neighborhood characterized by a high level of racial discrimination would increase the probability of developing major depression over an extended period of time, controlling for a number of other known risk factors. Consistent with expectations, we found that racial discrimination at the neighborhood level did predict the onset of major depression among African American women over a 9- to 11-year period, above and beyond the variability explained by social disorder and community cohesion at the neighborhood level and an extensive list of risk and resource variables at the individual level, including individual experiences of perceived discrimination. It should be noted that our sample was at relatively low risk for depression, given that none had experienced an episode of MDD at the time of the initial assessment when the average age was 37. This speaks to the strength of neighborhood racial discrimination as a contributing factor to depression.

In the current study, neighborhood-level discrimination was a stronger predictor of depression than individual reports of experiences of racially based discrimination. This is consistent with the view that when discrimination is viewed as pervasive it is seen as more difficult to avoid (i.e., global and stable) and undermines feelings of control (Schmitt, Branscombe, & Postmes, 2003). Pervasive racial discrimination is more likely to be experienced as rejection and exclusion of one's group by the larger society (Schmitt et al., 2003). Although participants in the current study were not asked the extent to which they perceived discrimination as pervasive, residing in a neighborhood in which many residents reported frequently

experiencing discrimination undoubtedly led to the perception that discrimination was widespread.

A range of interactions with neighborhood-level racial discrimination were tested, but a single interaction was significant: that with high-quality personal relationships. A classic buffering effect was found, such that among individuals with good-quality personal relationships the level of neighborhood discrimination was not significantly associated with the onset of depression. Buffering of neighborhood-level adversity by high-quality personal relationships was also found in a previous investigation (Cutrona et al., 2000). In that study, the effect of neighborhood-level social disorder on symptoms of distress was buffered by supportive interpersonal relationships. Thus, it appears that supportive relationships can help people maintain positive morale, even in the context of pervasive racial discrimination, perhaps through reinforcing self-esteem at both the individual level and the level of one's group identity.

It is important to note that residence in a neighborhood that is characterized by widespread perceptions of racial discrimination appears to have long-lasting effects. Past research on the link between neighborhood characteristics and mental health has not focused on these associations over extended periods of time (Aneshensel & Sucoff, 1996; Ross, 2000; Silver, Mulvey, & Swanson, 2002). Even when people moved out of the index neighborhood that was examined in the current study, having lived in a neighborhood characterized by widespread racial discrimination was associated with a higher risk for the onset of major depression over time. Two points are important regarding this finding. First, people form schemas of how society treats members of their racial group that are relatively long-lasting (Cox, Abramson, Devine, & Hollon, 2012). Second, even in the absence of any actual discrimination, expectations about the attitudes that others hold may lead to lower expectations and more negative emotions (Vorauer, Main, & O'Connell, 1998). Even if participants moved to a neighborhood that was lower on discrimination, they appear to have carried with them the expectations or schemas formed in neighborhoods from their earlier lives. Research on the formation of lasting beliefs about the pervasiveness of discrimination is needed.

Clinical Implications

In recognition that societal conditions are the primary etiological factor in depressive reactions to racial discrimination, it has been suggested that a distinctive diagnosis is appropriate. The term "cultural dysthymia" has been proposed to capture the syndrome of chronic low-level dysphoria and related symptoms that are often exhibited by targets of societal prejudice (Vontress, Woodland, & Epp, 2007). Such a label clearly pinpoints the culture or larger society as the central causal factor and avoids "blaming the victim." This approach recognizes that being embedded in a racist culture is sufficient to elicit depressive symptoms, even in the absence of severe incidents of discrimination or prejudice directed at oneself. A therapeutic framework that highlights the psychological toll extracted by societal racism is important, to avoid blaming the victim for the sense of powerlessness and hopelessness that is often experienced by those who encounter race-based discrimination (Franklin, Boyd-Franklin, & Kelly, 2006).

Of course, the larger problem and the core of discrimination-related depression is widespread racism and resulting discrimination and victimization. As expressed by Albee (1985, p. 213),

"One does not get rid of mass plagues afflicting humankind, including the plague of mental and emotional disorders, by attempts at treating the individual."[2] As a society, we need to find ways to prevent the development of racist and other prejudicial attitudes.

Limitations

The current sample is not nationally representative of African Americans. Our sample was drawn from just two states and none of our participants lived in major metropolitan areas during data collection. This may limit the generalizability of our findings. However, our sample did include individuals from a broad range of income and education levels, which helped in avoiding issues of restriction of range in socioeconomic status. Such restriction is common in studies of African Americans, wherein samples are often drawn from economically disadvantaged, inner-city settings.

Conclusion

Neighborhoods are complex and psychologically potent environments. For some, the neighborhood is a place of security and opportunity, whereas for others it is a place of discrimination, rejection, and victimization. Neighborhoods in which the experience of racially-based discrimination is widespread appear to have a demoralizing effect on mental health, above and beyond the effects of individual experiences of discrimination, which is probably outside of people's conscious awareness. Increased vulnerability to depression persists even after people move away from a neighborhood that was high on discrimination. The presence of affirming and supportive interpersonal relationships was the only individual factor found to buffer people from the effects of neighborhood discrimination. It is important to avoid blaming the victims of discrimination for their symptoms and to confront as a society the sources of racially based stereotypes and discriminatory behavior.

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[2] Albee (1985) attributes this quote to John Gordon, a professor of epidemiology at Harvard University.

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