Alcoholism Effects on Social Migration and Neighborhood Effects on Alcoholism Over the Course of 12 Years

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Background: Although a short-term effect of neighborhood characteristics on individual alcohol abuse has been demonstrated by a quasi-experimental residential mobility study, the observed effect of alcohol problem involvement on place of residence and residential character has not been studied. We test the alcoholism effect on place of residence, and we also attempt to replicate the neighborhood-to-alcoholism effect.

Methods: A sample of 206 Caucasian men (average age was 33) who were systematically recruited for alcoholism through a court record search of drunk driving offenses and door-to-door canvassing, in a 4-county-wide area were followed up at 3-year intervals in a prospective study of the course and outcomes of alcoholism. Participants' alcoholism diagnoses were made by semistructured diagnostic interviews. Residential addresses at baseline and at 12-year follow-up were geocoded. Corresponding census tract variables were used as indicators of neighborhood residential character.

Results: The regression analysis shows that, the more alcohol problems a man has, the more likely he is going to remain in, or migrate into, a disadvantaged neighborhood. This effect is only evident when a number of relevant confounding variables, including initial level of socioeconomic status, age, antisocial symptomatology, and spousal alcohol-use disorder status at baseline are controlled. Alcoholics in remission tended to live in neighborhoods whose residential characteristics were not distinguishable from those of nonalcoholics. Unremitted alcoholics, however, tended to stay in or migrate into more disadvantaged neighborhoods.

Conclusion: Alcoholic involvement has long-term negative effects on place of residence; involving an elevated likelihood of moving into or remaining in a disadvantaged neighborhood. Recovery from alcoholism is protective against downward social drift on the one hand, and is favorable to improvement in social conditions on the other.

Key Words: Alcoholism Severity, Neighborhood Characteristics, Recovery From Alcoholism.

The association between individual substance use and residential neighborhood characteristics has been studied in numerous cross-sectional studies. Neighborhood characteristics demonstrated to be associated with individual substance use include unemployment, poverty, low family cohesion, and residential mobility (Blomgren et al., 2004; Boardman et al., 2001; Karvonen and Rimpela, 1997; Oetting et al., 1998). Although the majority of the existing cross-sectional studies aimed to investigate the influence of neighborhood risk factors on individual substance-use behavior, they are not sufficient to establish causal relationships between the two constructs for the following reasons. First, cross-sectional studies do not take into account the duration that individuals have actually lived in a neighborhood when they participate in the study (Blomgren et al., 2004). Neighborhoods may have different effects on individuals depending on their exposure time. Second, although individuals are influenced by their environment, they are also able to choose their place of residence (Fauth et al., 2004). Individuals with high rates of substance use may be more likely to migrate to disadvantaged neighborhoods because of economic hardship or, alternatively, because of the convenience of obtaining alcohol or other drugs (Boardman et al., 2001).

Because of the inherent limitations of cross-sectional studies, prospective longitudinal studies are highly desirable in specifying the direction of causal relationship between individual substance use and neighborhood characteristics. A recent study following a sample of disadvantaged women at 2 time points over a 2-year interval found that participants’ perceptions of neighborhood disorganization at time 1 predicted their increasing heavy drinking at follow-up (Hill and Angel,
2005). However, a major limitation of that study was that both neighborhood characteristics (10 items) and heavy drinking (1 item) were measured subjectively by way of participant self-report. Women with drinking problems may have been under higher psychological distress and therefore tended to have negative perceptions of their neighborhoods. Thus, the “neighborhood effect” shown in the study may be artificial. Another recent study using data from the National Educational Longitudinal Study employed better measures of neighborhood characteristics based on 1990 U.S. census data (Hoffmann, 2002). Adolescent substance use (including alcohol, marijuana, and cocaine) was measured longitudinally at 10th grade and 12th grade. The longitudinal effect of neighborhood characteristics on substance use was not supported by the national data. One of the possible reasons for the lack of effect is that the study utilized zip codes instead of census tracts as the unit for calculating neighborhood characteristics. In general, a zip code covers a geographic area that is 2 to 3 times the size of a census tract and therefore includes residents with considerable heterogeneity of socioeconomic status (Thomas et al., 2006). Thus, an analysis based on zip codes actually examines community effects instead of neighborhood effects.

A quasi-experimental residential mobility study provides direct evidence to support short-term effects of neighborhood characteristics on individual alcohol abuse (Fauth et al., 2004). As part of the Yonkers Project, low-income minority families residing in high-poverty neighborhoods were randomly assigned via lottery to relocate to publicly funded houses in middle-class neighborhoods. Two years after the relocation, these “lucky” families reported less alcohol abuse in comparison with families who remained in high-poverty neighborhoods. In short, the presence of a positive-neighborhood context ameliorated the alcohol abuse. While manipulation of neighborhood characteristics like the Yonkers Project may benefit both the society and the scientific community, manipulating individual substance abuse is both technically and morally unfeasible. Thus, to examine the effects of individual substance use on residential migration and possible downward social drift, prospective observational studies remain the best design.

All 3 of the existing longitudinal studies reviewed above aimed to test the effect of neighborhood characteristics on individual substance use. Moreover, they all spanned a relatively short period of time (2 years) and therefore tested only short-term effects. In contrast, the primary goal of the present study was to examine the long-term effect of individual alcohol use on social migration. We examined this relationship across 5 waves of measurement spanning 12 years, using data from the ongoing Michigan Longitudinal Study (MLS) on families at risk for alcoholism and other substance-use disorders (Zucker et al., 2000). We measured neighborhood characteristics of study families at baseline and at the 12-year follow-up by matching the U.S. census tract data with their addresses. We also assessed their cumulative level of alcohol problems by conducting semistructured interviews at their homes at each wave. A 3-year alcohol-use disorder (AUD) diagnosis for each adult participant was made by a clinician using Diagnostic and Statistical Manual (DSM)-IV criteria (American Psychiatric Association, 1994) at each wave. Thus, the measures on both the predictor and outcome were not subjected to the flaws of existing longitudinal studies.

MATERIALS AND METHODS

Design and Sample

Alcoholic families were ascertained through men identified by a network covering all district courts in a 4-county area. All men with drunk driving convictions involving a blood alcohol concentration of at least 0.15% if first conviction (or at least 0.12% if a previous drinking-related legal problem had occurred) were potential enrollees. They also needed to meet diagnosis for probable or definite alcoholism (Feighner et al., 1972), and due to offspring studies also conducted with this sample, were required to have at least 1 biological son between 3 and 5 years of age. The man also had to be living with the child and his biological mother at time of family consent, although the unstable nature of some of these relationships is illustrated by the fact that some couples were no longer living together by the end of the baseline assessment protocol. Alcohol status of the mothers within these families was free to vary. A contrast/control group of nonalcoholic families (neither parent with a substance abuse history), was recruited by exhaustive door-to-door canvass in the same neighborhoods as the alcoholic families. This canvassing procedure also resulted in recruitment of an intermediate-risk group, as some families of parallel composition were identified who had alcoholic fathers, but without a history of alcohol-related legal or drunk driving problems occurring during the life of their child. Original recruitment used Feighner criteria (Feighner et al., 1972); thereafter parents were rediagnozed using DSM-IV AUD criteria. A more detailed description of study method is provided in an earlier report (Zucker et al., 2000).

The MLS families receive extensive in-home assessments at baseline, and thereafter at 3-year intervals. In this study, we only included the 206 families (all Caucasian) who (i) completed both baseline (T1) and the 12-year follow-up (T5) and (ii) had at least 2 data points where AUD diagnoses were available between T1 and T4 (9-year follow-up). Twelve families were excluded because they did not meet these criteria. Five of them were alcoholic families; 7 were controls. The average age and education years of the men of these excluded families were also comparable with the study sample (33 years old; 14 years of education). Because of the recruitment criteria of the study, the majority of women (more than 70%) maintained negative AUD diagnosis through T4. Thus, we decided to focus our analysis on the men because they had greater variance in alcoholism severity.

Measures

Alcoholism Severity Index. This longitudinal measure of alcoholism status was assessed combining information from the Short Michigan Alcohol Screening Test (SMAST; Selzer et al., 1975), the Diagnostic Interview Schedule (DIS; Robins et al., 1980, 1996), and the Drinking and Drug History Questionnaire (DDHQ; Zucker et al., 1990). The SMAST and DIS are both well validated and widely used diagnostic instruments. The DDHQ incorporates items from national epidemiologic studies of drugs (Johnston et al., 1979) and alcohol (Cahalan et al., 1969) as well as from a structured clinical symptom questionnaire (Schuckit, 1978). Items provide data on quantity, frequency, and consequences of substance use. Based on the composite information of these 3 instruments, a 3-year DSM-IV AUD diagnosis was made by a trained MA- or PhD-level clinician. When discrepancies were observed among the measures, the more
severe pattern was taken as the best estimate. Inter-rater reliability was established by having another clinical psychologist blindly diagnose a subset of the protocols; k-value was 0.81. In the present study, we computed an alcoholism severity index for each of the 206 men by averaging severity codings across T1 to T4. The severity at each wave was coded as: 0 for negative diagnosis; 1 for alcohol abuse; 2 for alcohol dependence without physical dependence; and 3 for alcohol dependence with physical dependence. The resulting alcoholism severity index, a continuous scale ranging from 0 to 3, is the major predictor for neighborhood characteristics at T5. We also used wives’ AUD status (coded as 1 for positive diagnosis; 0 for negative diagnosis) at baseline as a predictor.

**Antisocial Behavior Checklist.** The Antisocial Behavior Checklist (ASB) (Zucker, 1999; Zucker et al., 1996) measures the frequency of the respondent’s participation in a variety of aggressive and antisocial activities over the life span. A series of reliability and validity studies with populations have shown adequate test–retest reliability (0.91 over 4 weeks) and internal consistency (α = 0.67 to 0.93). The instrument differentiates between individuals with histories of antisocial behavior (e.g., convicted felons) versus individuals with minor offenses versus university students. The instrument also discriminates alcoholic from nonalcoholic male adults. At wave 1, both childhood and adulthood items were administered, whereas in later waves, only adulthood items were asked. In the present study, the childhood ASB score was used as a predictor of residential neighborhood characteristics at T5.

**Demographic Questionnaire.** This instrument assesses background characteristics of self and family of origin. The following individual level variables for each man were used to predict neighborhood characteristics at T5: age at baseline, years of education, and socioeconomic status (SES). SES was coded based on occupation at baseline (Mueller and Parcells, 1981). The index is a continuous scale ranging from 0 (unemployed) to 904 (law professor).

**Residential Neighborhood Characteristics.** Residential addresses of the 206 men at T1 and T5 were matched with census tract codings at the corresponding census years. At T1, 57% of our participants were assessed in 1980s, whereas the rest of them were assessed in 1990s. At T5, 31% were assessed in 1990s, whereas the rest of them were assessed in 2000s. If the assessment was done in 1980s, we used the 1980 census data. The same rule applied to the assessments conducted in 1990s and 2000s. From T1 to T5, 62.14% of the men had moved to different census tracts, making it likely that their neighborhood characteristics changed. For the men who remained in the same census tracts, census statistics for those neighborhoods also underwent change from T1 to T5 (a 12-year interval) due to changes in local socioeconomic environment and resident composition. As the interval of the study extended from the late 1980s to early 2000s, the following 5 neighborhood disadvantage variables previously demonstrated to be related to individual substance use (Blomgren et al., 2004; Boardman et al., 2001; Karvonen and Rimpela, 1997; Oetting et al., 1998) were computed for the 1980, 1990, and 2000 census years: (1) percentage of 15+year-old residents who were separated or divorced; (2) percentage of male residents in the labor force who were unemployed; (3) percentage of households that had public assistance income; (4) percentage of residents who resided in different houses 5 years ago; and (5) percentage of residents whose income was below the poverty level.

**Analytic Approach**

Although the main focus of the analysis was to test if cumulative alcohol problems from T1 to T4 predicted residential neighborhood environment at T5, we need to control for important individual differences in baseline neighborhood environment, as well as individual SES, age, antisocial symptomatology, and spousal AUD status, which could all contribute to downward social migration over time. We regressed each of the 5 neighborhood characteristics at T5 on the alcoholism severity index, the corresponding neighborhood variable at T1, and the other control variables. We hypothesized that higher alcoholism severity at T1 to T4 would predict a higher divorce rate, a higher male unemployment rate, a higher percentage of households under public assistance, a higher residential mobility, and a higher poverty rate in the neighborhood of residence at T5, controlling for the other variables.

In addition to the cumulative alcoholism effect from T1 to T4 as tested in the regression models, we examined the potentially different longitudinal patterns of alcoholic involvement over this period of time. In particular, we were interested in whether remitted alcoholic men ended up living in different kinds of neighborhoods than unremitting alcoholic men. About 90% of the participants had alcoholism diagnostic data on at least 3 of the 4 possible assessment points, and thus these people were used to find reliable patterns. Among these men, we identified 3 alcoholic groups that are of interest for comparison: (1) the nonalcoholic group (n = 79) never met AUD diagnosis; (2) the remitted alcoholic group (n = 30) met AUD diagnosis at baseline but recovered in at least 2 consecutive later time points; (3) the unremitting alcoholic group (n = 38) met AUD diagnosis at all time points. The rest of the 37 men who did not belong to any of these groups had heterogeneous relapsing–remitting patterns, and so they were not included in the group comparison. The 3 groups were compared on neighborhood characteristics at baseline and at 12-year follow-up using Tukey’s studentized range test (Kramer, 1956) with Type I experimentwise error controlled at the 0.05 level. Our hypothesis was that these three groups were not different at baseline. However, at 12-year follow-up, the residential neighborhood environment of the unremitting alcoholic group was hypothesized to be more disadvantaged than the neighborhoods in which the other two groups resided.

**RESULTS**

Means and standard deviations of both the individual level and census tract variables are shown in Table 1. The men who participated in this study were on average 33 years old with 14 years of education. Their average SES (363) was somewhat lower than the median of the scale (452). Examples of the occupation corresponding to this average SES are therapy assistants (364) and bill/account collectors (359). Their average childhood ASB score, 9.22, was high; a score of 10 or greater is the cut-off needed to qualify for the child conduct problem criterion portion of an antisocial personality disorder diagnosis in DSM-IV (Zucker, 1999). The variance of the alcoholism severity index was high (=1) given that the scale ranges from 0 to 3. The value for this index was 0 (nonalcoholic) for 39% of these men, whereas 25% had index values in the range of 2 to 3 (alcohol dependence). Although the recruitment protocol allowed the AUD status of the wives to freely vary, only 17% met diagnostic criteria at baseline. About 70% of the women had value 0 on the alcoholism severity index, whereas only 9% of them had index values in the range of alcohol dependence.

A number of the men’s residential neighborhood characteristics changed significantly during the 12-year interval, but...
not all were in the same direction, suggesting heterogeneity of process and also considerable within group heterogeneity. Paired t-test results indicated that, at the last follow-up, divorce rate was higher in the neighborhoods where these men ended up than it was at baseline, there was no change in level of poverty, but other neighborhood characteristics indicated an improvement in surroundings. The male unemployment rate was lower, the percentage of households under public assistance was lower, and residential mobility in the neighborhood was lower.

Table 2 shows the regression coefficients and corresponding statistical significance for the regression models of 12-year residence outcome on alcoholism severity. These analyses provide a clearer picture of change because they controlled for baseline neighborhood level as well as potential confounds. As expected, the alcoholism severity index averaged over 9 years predicted neighborhood environment at T5, conditional on the effects of the other predictors. Men with more alcohol involvement tended to place themselves in more disadvantaged neighborhoods. In addition, neighborhood environment at baseline significantly predicted neighborhood environment at the 12-year follow-up. Childhood ASB and spousal AUD status at baseline did not turn out to be significant predictors for residential characteristics at T5, above and beyond the alcoholism effect. The influence of age was only significant vis-a-vis divorce rate and male unemployment rate. The older the participant at baseline, the more likely he ended up living later on in a neighborhood with disadvantage markers of higher divorce and higher male unemployment rates. After taking account of the baseline neighborhood environment, education only (negatively) predicted male unemployment rate, whereas SES only predicted the 2 neighborhood indicators for poverty. The more years of education the participant had, the less likely he would be living in a neighborhood with a high male unemployment rate 12 years later. Those with higher SES were also less likely to be living thereafter in neighborhoods of high poverty.

Table 3 shows means and standard deviations of the neighborhood characteristic variables for 3 groups who differed in alcoholic diagnosis and course. Table 3 also shows the corresponding statistical group comparison results. At baseline, the 3 groups were statistically equivalent on all neighborhood characteristics except for the divorce rate within the census tract (i.e., nonalcoholics were living in areas that had higher census divorce rates than remitted alcoholics). Although the values of the means for the remitted group were slightly lower (i.e., better) than the other two groups, the group difference was not statistically significant. This overall lack of difference is a further confirmation of the study’s original sampling strategy (Zucker et al., 2000), whereby both nonalcoholic controls and community ascertained alcoholics were recruited via door-to-door canvassing out of the same neighborhoods as the court alcoholics—the group that at time of inception was the most actively symptomatic. However, when these 3 groups were compared at the 12-year follow-up, the remitted alcoholic group tended to reside in less disadvantaged neighborhoods.

### Table 1. Descriptive Statistics for Individual Level and Residential Neighborhood Census Tract Variables for 206 Men

<table>
<thead>
<tr>
<th>Individual Level Variables</th>
<th>At baseline</th>
<th>At 12-year follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcoholism severity index</td>
<td>0.96 (1.01)</td>
<td>11.30 (3.81)*</td>
</tr>
<tr>
<td>Childhood antisocial behavior</td>
<td>9.22 (6.13)</td>
<td>4.64 (3.17)*</td>
</tr>
<tr>
<td>Age at baseline (years)</td>
<td>32.95 (5.06)</td>
<td>3.49 (3.77)*</td>
</tr>
<tr>
<td>Education (years)</td>
<td>13.82 (2.24)</td>
<td>43.26 (10.04)*</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>362.71 (192.81)</td>
<td>8.20 (7.62)</td>
</tr>
<tr>
<td>Wife’s AUD status at baseline</td>
<td>16.99%</td>
<td>0.07 (0.31)</td>
</tr>
<tr>
<td>Percentage divorce</td>
<td>10.16 (4.25)</td>
<td>10.26 (2.60)</td>
</tr>
<tr>
<td>Percentage male unemployment</td>
<td>8.27 (3.66)</td>
<td>0.21 (0.05)</td>
</tr>
<tr>
<td>Percentage public assistance</td>
<td>4.81 (4.65)</td>
<td>43.26 (10.04)*</td>
</tr>
<tr>
<td>Percentage different residence 5 years ago</td>
<td>46.70 (9.68)</td>
<td></td>
</tr>
<tr>
<td>Percentage poverty</td>
<td>8.42 (6.41)</td>
<td>8.20 (7.62)</td>
</tr>
</tbody>
</table>

The numbers in each cell are mean and standard deviation (in parenthesis).

AUD, alcohol-use disorder.

*The alcoholism severity index (range = 0 to 3) is averaged across 4 measurement points over 9 years (see text).

*Neighborhood characteristic significantly improved/worsened from baseline to 12-year follow-up (p < 0.001).

### Table 2. Effects of Alcoholism Severity on 12 Year Residential Outcome, Controlling for Baseline Residential Census Variables, Demographic Characteristics, Antisocial Symptomatology, and Spousal AUD Status (n = 206)

<table>
<thead>
<tr>
<th></th>
<th>T5 Percentage Divorce</th>
<th>T5 Percentage Male Unemployment</th>
<th>T5 Percentage Public Assistance</th>
<th>T5 Percentage in Different Residence</th>
<th>T5 Percentage Poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5.88* (2.57)</td>
<td>4.35* (2.15)</td>
<td>4.94* (2.60)</td>
<td>17.26* (7.03)</td>
<td>2.81 (5.26)</td>
</tr>
<tr>
<td>Baseline census variable</td>
<td>0.31* (0.06)</td>
<td>0.20* (0.06)</td>
<td>0.08 (0.05)</td>
<td>0.38* (0.07)</td>
<td>0.26* (0.08)</td>
</tr>
<tr>
<td>Alcoholism severity index</td>
<td>0.48* (0.28)</td>
<td>0.64* (0.23)</td>
<td>0.70* (0.28)</td>
<td>2.05* (0.73)</td>
<td>1.52* (0.57)</td>
</tr>
<tr>
<td>Childhood antisocial behavior</td>
<td>-0.01 (0.05)</td>
<td>-0.03 (0.04)</td>
<td>-0.02 (0.05)</td>
<td>0.03 (0.12)</td>
<td>0.02 (0.09)</td>
</tr>
<tr>
<td>Age at baseline</td>
<td>0.12* (0.05)</td>
<td>0.09* (0.04)</td>
<td>0.04 (0.05)</td>
<td>0.03 (0.13)</td>
<td>0.09 (0.10)</td>
</tr>
<tr>
<td>Education (years)</td>
<td>-0.10 (0.15)</td>
<td>-0.28* (0.12)</td>
<td>-0.15 (0.15)</td>
<td>0.28 (0.40)</td>
<td>0.07 (0.31)</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td>-0.002 (0.002)</td>
<td>-0.001 (0.001)</td>
<td>-0.004* (0.002)</td>
<td>0.003 (0.005)</td>
<td>-0.01* (0.004)</td>
</tr>
<tr>
<td>Wife’s AUD status at baseline</td>
<td>0.39 (0.70)</td>
<td>-0.67 (0.57)</td>
<td>-0.90 (0.71)</td>
<td>0.21 (1.82)</td>
<td>-0.93 (1.44)</td>
</tr>
<tr>
<td>R²</td>
<td>16.85%</td>
<td>20.53%</td>
<td>11.65%</td>
<td>18.62%</td>
<td>12.05%</td>
</tr>
</tbody>
</table>

The numbers in each cell are regression coefficient and standard error (in parenthesis).

AUD, alcohol-use disorder.

*The regression coefficient is significantly greater/less than zero (p < 0.05).
neighborhoods with lower divorce rates, lower percentages of households under public assistance, lower residential mobility, and lower poverty rates than the unremitted group. There was no difference between the remitted alcoholic group and the nonalcoholic group in terms of neighborhood environments at the 12-year follow-up.

The analyses we have carried out have all been guided by the hypothesis that presence of active AUD will have a long-term, negative effect on the alcoholic’s residential neighborhood characteristics. At the same time, the obverse relationship may also be operating. In fact, as noted in our review, the Yonkers Project (Fauth et al., 2004) demonstrated short-term effects of neighborhood characteristics on individual alcohol abuse. However, the time span of that study leaves open the question of whether such neighborhood effects would be sustained over a longer time interval. Using our study’s longitudinal data, we conducted an exploratory analysis to examine this long-term effect. We took the average of the 5 census tract variables at baseline as an index for participants’ baseline neighborhood characteristics to predict their DSM-IV alcoholism symptom counts (measured by DIS) at the 12-year follow-up, controlling for their baseline AUD statuses, childhood ASB scores, ages, education levels, SES, and spousal AUD at baseline. The result showed that both positive AUD diagnosis and residency in worse neighborhoods at baseline predicted more alcoholic symptoms 12 years later (see Table 4). This baseline neighborhood effect is not likely to be confounded by baseline AUD status because the alcoholics did not live in worse neighborhoods than the nonalcoholics at baseline under our neighborhood recruitment protocol.

**DISCUSSION**

This study has two major findings. First, the more alcohol problems a man has, the more likely he is going to remain in, or migrate into, a disadvantaged neighborhood. This effect is only evident when a number of relevant confounding varia-

### Table 3. Residential Neighborhood Characteristics at Baseline and at 12-Year Follow-Up for Those Who Remained Nonalcoholic, Whose Alcoholism Had Remitted, and for Those Who Were Unremitted (n = 147).

<table>
<thead>
<tr>
<th>Residential neighborhood characteristics at baseline</th>
<th>Nonalcoholic (n = 79)</th>
<th>Remitted Alcoholic (n = 30)</th>
<th>Unremitted Alcoholic (n = 38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage divorce</td>
<td>11.07 (4.00)</td>
<td>8.13* (4.15)</td>
<td>10.14 (3.98)</td>
</tr>
<tr>
<td>Percentage male unemployment</td>
<td>7.79 (3.88)</td>
<td>7.91 (3.03)</td>
<td>8.68 (3.25)</td>
</tr>
<tr>
<td>Percentage on public assistance</td>
<td>5.56 (4.87)</td>
<td>3.95 (5.06)</td>
<td>4.23 (3.56)</td>
</tr>
<tr>
<td>Percentage different residence</td>
<td>47.87 (8.50)</td>
<td>44.40 (10.64)</td>
<td>47.34 (11.82)</td>
</tr>
<tr>
<td>Percentage at or below poverty level</td>
<td>8.72 (6.73)</td>
<td>7.22 (6.35)</td>
<td>8.51 (5.04)</td>
</tr>
</tbody>
</table>

The numbers in each cell are mean and standard deviation (in parenthesis).
*The mean of the alcoholic group is significantly different from the mean of the nonalcoholic group (p < 0.05).
**The mean values of the two alcoholic groups are significantly different from each other (p < 0.05).

### Table 4. Effects of Baseline Neighborhood Environment on 12-Year Alcoholism Outcome, Controlling for Self and Spousal AUD Statuses at Baseline, Antisocial Symptomatology, and Demographic Characteristics (n = 206)

| Regression coefficient (standard error) | Intercept 4.38 (14.99) | Baseline neighborhood characteristics index* 0.77 (0.33)* | Self-AUD status at baseline 13.25 (3.25)* | Spousal AUD status at baseline 2.75 (3.98) | Childhood antisocial behavior 0.22 (0.25) | Age at baseline (years) −0.25 (0.28) | Education (years) −0.47 (0.85) | Socioeconomic status −0.004 (0.01) | $R^2$ 18% |

AUD, alcohol-use disorder.
*The baseline neighborhood characteristics index is averaged across 5 census tract variables at baseline (see text).
*The regression coefficient is significantly greater/less than zero (p < 0.01).
controlling for possible confounds, baseline AUD status was not a significant predictor of neighborhood residential characteristics at T5 ($p > 0.05$).

The analyses we have carried out have been guided by the primary hypothesis that alcoholism is a proactive disorder, which influences the quality of life the alcoholic individual is able to sustain. We have shown that in its active form, alcoholism has negative impact on the alcoholic individual’s residential quality of life. However, when the diagnosis is in remission, residential neighborhood characteristics are not distinguishable from those of nonalcoholic individuals. We also were able to replicate a previously observed longitudinal effect of neighborhood upon alcoholism, albeit over a considerably longer period of time than in prior work. Over an interval of more than a decade, we also found that disadvantaged residential neighborhood characteristics increased the likelihood of greater severity of alcoholism for its residents.

Our study has 3 limitations. First, this is an observational study and not an experimental one, so it is not the most ideal design for making causal inference. At the same time, as pointed out in the introduction, it is both technically and morally unfeasible to carry out an experimental manipulation. Nevertheless, we carefully controlled for important confounding factors in the regression model. Moreover, we used earlier alcoholic involvement (T1 to T4) to predict neighborhood environment at a later time point (T5); thus, one may argue for the direction of causal relationship based on the time series of events. Second, because of the family study design of the MLS, the men recruited into the study had to reside with the male child and his biological mother at time of initial baseline recruitment. This recruitment criterion reduced external validity somewhat, as the results can only be generalized to men in an initially coupled relationship. The third limitation is that, due to the 100% male sample, these results cannot be generalized to women. This restriction came about because alcoholism in women is much less common, and also because marital assortment and MLS recruitment criteria produced a female sample that has a low rate of AUD. Therefore, there was not sufficient variance in alcoholism severity to test the study hypotheses. Although it is a more difficult job because of lower population frequencies, nonetheless, future studies should recruit women with varying degrees of alcoholic involvement to study these longitudinal alcoholism effects.

Another important future direction is to examine the long-term impact of alcoholic social migration on their children’s mental health. Although housing mobility studies might be used to test this effect, 2 recent reviews of the existing studies found that: (1) health-related data have been collected in just a few studies; (2) only a handful of studies are methodologically sound; and (3) empirical evidence to support the occurrence of long-term effects is sparse (Acevedo-Garcia et al., 2004; Varady and Walker, 2003). The MLS has been conducting comprehensive assessments on study children’s mental health at baseline (3 to 5 years old) and thereafter at 3-year intervals, as well as conducting annual assessments on offspring during ages 11 to 23. Thus, future analysis on this sample will have the potential to address this issue.

ACKNOWLEDGMENTS

This work was supported by NIAAA Grant R37 AA-07065 to R. A. Zucker and H. E. Fitzgerald. We would like to thank Holly Frei for her assistance with geocoding and data entry.

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