Neighborhood socioeconomic status and substance use by U.S. adults

Katherine J. Karriker-Jaffe *

Public Health Institute, Alcohol Research Group, 6475 Christie Avenue, Suite 400, Emeryville, CA 94608-1010, United States

ABSTRACT

Background: This study examined relationships of extremes in neighborhood socioeconomic status with use of tobacco, alcohol, marijuana and other drugs. Hypotheses were (1) residence in disadvantaged neighborhoods would be positively associated with stress-related and higher-risk substance use patterns (e.g., drug use), and (2) residence in affluent neighborhoods would be positively associated with "healthy" substance use (e.g., drinking within recommended guidelines) and negatively associated with substance use patterns incompatible with a culture of health. Age was examined as a potential moderator.
Methods: Data were from nationally-representative samples of U.S. adults ($N = 14,531$) from the 2000 and 2005 National Alcohol Surveys linked with indicators of neighborhood SES from the 2000 U.S. Decennial Census. Analyses included gender-stratified multivariate logistic regression using weights to adjust for sampling and non-response.
Results: As hypothesized, compared to middle-class neighborhoods, residence in disadvantaged neighborhoods was associated with higher odds of both men's and women's tobacco use and with women's other drug use. Residence in affluent neighborhoods was associated with lower odds of men's tobacco use and women's marijuana use. The association of neighborhood SES with men's tobacco use was modified by age, with the highest odds of daily tobacco use evident for all men in disadvantaged neighborhoods, as well as for younger men in middle-class neighborhoods. There were no significant associations of either alcohol outcome with neighborhood SES.
Conclusions: Increased risk of substance use for younger residents in both disadvantaged and middle-class neighborhoods and for older residents in disadvantaged neighborhoods suggest a need for targeted prevention interventions.

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1. Introduction

The importance of the neighborhood context for successful child and adolescent development has long been acknowledged (Bronfenbrenner, 1979), and studies of neighborhood effects on youth have proliferated over the past two decades (Leventhal and Brooks-Gunn, 2000). Neighborhood effects persist into adulthood, as the place one lives provides a context for both work and leisure, and many people develop important social relationships with neighbors. In the best cases, neighborhoods provide infrastructure and social structures that are positive resources for residents both young and old (Browning and Cagney, 2003; Robert, 1999; Wen et al., 2003); however, neighborhoods also can cause stress and tension (Cohen et al., 2003; Ewart and Suchday, 2002; Fitzpatrick and LaGory, 2000) or provide contextual cues and social norms promoting health risk behaviors such as alcohol or drug use (Ahern et al., 2008). For some, the combination of neighborhood stress and permissive social norms may result in tobacco, alcohol or other drug use to cope with increased anxiety and tension (Greeley and Oei, 1999; Moos et al., 1989). Neighborhood effects vary quite widely according to individual attributes, including the amount of time spent near home (Inagami et al., 2007). The current study examines effects of neighborhood socioeconomic status (SES) on substance use in a national sample of U.S. adults and examines variation by gender and age.

Studies of neighborhood effects on adult health outcomes suggest neighborhood SES is an important marker of a variety of contextual factors that impact health and behavior. Disadvantaged neighborhoods often suffer from illicit drug sales and proliferation of alcohol outlets including bars and liquor stores (Bluthenthal et al., 2008), as well as erosion of social controls of behaviors considered to be risky, antisocial or unconventional (Sampson and Groves, 1989; Wilson, 1987). Visible drug sales (Bradizza and Stasiewicz, 2003; Kadushin et al., 1998; Lambert et al., 2004), high alcohol outlet density (Bryden et al., 2012; Livingston et al., 2007; Theall et al., 2009) and social disorganization (Duncan et al., 2000; Esbensen and Huizinga, 1990; Hill and Angel, 2005; Lambert et al., 2004; Wilson et al., 2005) each contribute to substance use and

* Tel.: +1 510 597 3440; fax: +1 510 985 6459.
E-mail address: kkarrikerjaffe@arg.org

associated problems. At the other end of the socioeconomic spectrum are more affluent areas. Residents of these areas often embrace health-related lifestyles (Cockerham et al., 1997; Ross, 2000). In contrast with neighborhood disadvantage, neighborhood affluence may be associated with certain types of light, recreational substance use patterns that are compatible with a sub-culture of health, such as moderate alcohol use.

Some studies show strong associations between neighborhood disadvantage and increased use of tobacco, alcohol or drugs (Boardman et al., 2001; Datta et al., 2006; Diez Roux et al., 2003; Giggs et al., 1989; Stimpson et al., 2007; Waitzman and Smith, 1998; Williams and Latkin, 2007). A recent review found that neighborhood SES was associated with both adult and adolescent substance use outcomes, with effects of neighborhood disadvantage noted more consistently in samples of adults (Karriker-Jaffe, 2011). There have only been a few studies conducted in the U.S. with national samples, as in the current study. Those suggest that neighborhood disadvantage is associated with recreational and illicit drug use (Ford and Beveridge, 2006; Hoffmann, 2002), heavy drinking (Karriker-Jaffe et al., 2012; Stimpson et al., 2007), and alcohol-related problems (Jones-Webb et al., 1997; Karriker-Jaffe et al., 2012). However, these national studies of neighborhood effects on drug outcomes often find differing results depending on the specific neighborhood measure employed. This was the case in the study by Hoffmann (2002), which documented a positive association between male joblessness in the neighborhood and adolescent drug use, as well as a negative association of the same outcome with neighborhood poverty. Findings also tend to vary by the particular outcome considered, such as in the study by Ford and Beveridge (2006), which showed neighborhood disadvantage was associated with increased use of barbiturates and amphetamines, but not greater use of marijuana, cocaine, LSD or tranquilizers. The current study contributes to the extant literature by considering separate substance use outcomes in addition to alcohol, while using a Census-based composite measure of neighborhood socioeconomic status (SES) that allows differentiation of effects of affluent and disadvantaged (compared to middle-class) neighborhoods in a national sample of U.S. adults.

Characterization of neighborhoods in this manner is important, as there may be unique characteristics associated with conditions of advantage that are not captured by a mere absence of disadvantage (Robert, 1999). That is, there may be distinct benefits to residence in the most affluent areas that are not present in other non-poor, middle-class neighborhoods (Browning and Cagney, 2003). Thus, the two extremes in neighborhood socioeconomic conditions (i.e., disadvantage and affluence) may differ in their relationships with substance use outcomes. For example, there is evidence for adults that neighborhood affluence is associated with being an alcohol drinker (Galea et al., 2007a,b) and regularly using alcohol (Chuang et al., 2005; Pollack et al., 2005), while neighborhood disadvantage is associated with abstinence from alcohol (Karriker-Jaffe et al., 2012). It remains unclear whether neighborhood affluence is associated (either positively or negatively) with problem drinking, although analyses using a subset of the data included in the present investigation suggest there may not be a strong association (Mulia and Karriker-Jaffe, 2012). Two analyses of data from New York City suggest higher neighborhood incomes (Galea et al., 2007b) and higher neighborhood education (Galea et al., 2007a) are associated with increased marijuana use, but effects on other drugs were not reported. It is unknown whether findings from prior research will replicate when national data on other drug use by adults is considered.

Thus, this study examines relationships of neighborhood SES with five substance use outcomes using data from two national samples of U.S. adults (analyzed together). The hypotheses are as follows: (1) compared to middle-class neighborhoods, residence in disadvantaged neighborhoods will be positively associated with stress-related and risky substance use patterns (daily tobacco use, monthly drunkenness, monthly use of marijuana and monthly use of other drugs), and (2) compared to middle-class neighborhoods, residence in affluent neighborhoods will be positively associated with "healthy" substance use (drinking within recommended guidelines), but negatively associated with substance use patterns incompatible with a culture of health (particularly daily tobacco use and monthly use of drugs other than marijuana).

Neighborhood effects may be more pronounced for younger adults, as they are more likely to engage in substance use than their older counterparts and they may be more involved in neighborhood-based social networks formed through school activities; however it also is possible that older adults may be more place-bound after retirement from formal employment and thus may be more strongly influenced by their residential environment (Bernard et al., 2007). As such, interactions with age also are assessed. As gender differences in relationships of substance use patterns with neighborhood SES have been suggested by other studies (Karriker-Jaffe et al., 2012; Karvonen and Rimpelä, 1996, 1997; Matheson et al., 2011), we present gender-stratified models to highlight any differences in associations of these outcomes with neighborhood disadvantage and affluence. Finally, because some studies show neighborhood disadvantage is associated with both increased abstinence and increased heavy drinking and alcohol-related problems among some drinkers (Karriker-Jaffe et al., 2012), we conduct analyses of the alcohol outcomes in the full sample and in a restricted sample of past-year drinkers.

2. Methods

2.1. Study design

2.1.1. Dataset. Survey data come from the 2000 and 2005 National Alcohol Surveys (NAS). Both cross-sectional surveys utilized computer-assisted telephone interviews with randomly-selected adults ages 18 and older. Each survey included oversamples of African-Americans, Hispanics, and residents from low-population states. For more details on methodology, please see Kerr et al. (2004) and Midanik and Greenfield (2003). The 2000 NAS included 7613 respondents (58% response rate); the 2005 NAS included 6919 respondents (56% response rate). Although lower than those of many face-to-face surveys, these response rates are typical of telephone surveys in a time of increasing barriers to random-digit dial studies in the U.S. (Midanik and Greenfield, 2002). Evidence suggests low response rates for telephone surveys may not bias estimates as much as low response rates for in-person studies, because most telephone sample losses are due to immediate hang-ups that occur prior to description of the study (Groves, 2006).

Survey data were matched with indicators of neighborhood SES from the 2000 Census (U.S. Census Bureau, 2002). Respondent addresses were matched with census geocodes by a commercial geocoding firm, and were found to be highly accurate when compared to the gold standard recommended by Krieger et al. (2001). Survey data then were linked via these geocodes to indicators of neighborhood SES at the census tract level. Census tracts effectively delineate social and structural determinants of health behaviors, including substance use (Cook et al., 1997; Karriker-Jaffe, 2011; Krieger et al., 2002). Approximately two-thirds (60%) of the sample had geocodes assigned based on the street address; the remainder had a geocode assigned based on the ZIP Code centroid. Preliminary analyses determined that the relationship between neighborhood SES and the outcomes did not vary significantly according to geocode precision (data available upon request). Regardless, all analyses adjusted for the precision of the geocode match.