



Neighborhood conditions and trajectories of alcohol use and misuse across the early life course



Peter B. Barr

Department of Psychology, Virginia Commonwealth University, 817 W. Franklin St., Suite B-16, Office B-30, Richmond, VA 23284, United States

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ABSTRACT

While neighborhood conditions have been linked to alcohol misuse, less is known about the long-term consequences of exposure to adverse neighborhood conditions early in the life course. Using data from the National Longitudinal Survey of Adolescent to Adult Health, we examined how trajectories of alcohol behaviors from ages 12 to 32 varied according to neighborhood disorder, disadvantage, and advantage. Early exposure to adverse neighborhood conditions placed individuals at greater risk of being a current drinker and alcohol misuse, though these individuals never reached the same levels as those in more stable, advantaged neighborhoods. Early exposure appears to place individuals at risk for alcohol misuse across the early life course.

1. Introduction

Alcohol use and the problems that arise from it remain a serious threat to public health (World Health Organization, 2014). The factors that contribute to the varying stages and severity of alcohol use (e.g. initiation of use, regular consumption, heavy use, and alcohol-related problems) stem from multiple levels including social structural, interpersonal, and genetic influences. Research on the relationship between neighborhood context and alcohol-related behaviors has helped improve our understanding of how neighborhood conditions, including economic, social, and physical conditions, can alter an individual's ability to lead a healthy life, especially in regards to alcohol misuse. In the current analyses, we determine whether early life neighborhood conditions have implications for trajectories of alcohol misuse across adolescence and into early adulthood.

Broader social and economic forces pattern the social conditions within neighborhoods. Economic disadvantage at a neighborhood level (often assessed using census based socioeconomic indicators) is associated with greater levels of neighborhood disorder and crime (Sampson et al., 1997). Neighborhood disorder is characterized by the presence of both physical disorder (e.g. litter, graffiti, dilapidated buildings) and social disorder (e.g. open drug use or sales, teenage peer groups loitering). This increase in disorder occurs primarily through weakened local institutions like the family and schools (Wilson, 2012). For example, adolescents in these neighborhoods are at heightened risk of dropping out of school (Harding, 2003) or coming from single-parent families (South and Crowder, 1999), increasing the likelihood they spend large portions of time unsupervised.

Additionally, as fear and mistrust of neighbors spreads, adults may become less willing to intervene when they witness young people acting out in public spaces (Sampson et al., 1997), resulting in the breakdown of a neighborhood's ability to maintain informal social control (or collective efficacy). The greater levels of disorder in these disadvantaged neighborhoods also leads to greater ambient hazards like fear of victimization (Aneshensel and Sucoff, 1996), and exposure to violence (Turner et al., 2013).

Both the breakdown in social control and increase in exposure to psychosocial stressors are thought to be primary mechanisms by which neighborhood disadvantage influences the alcohol use of residents, as neighborhood disadvantage is associated with increases in consumption frequency, heavy/binge drinking, alcohol problems, and negative consequences from drinking, even after accounting for a variety of individual-level covariates related to both alcohol use and neighborhood composition (Cerdá et al., 2010; Karriker-Jaffe et al., 2012; Mulia and Karriker-Jaffe, 2012; Jones-Webb and Karriker-Jaffe, 2013). These effects may vary across individual characteristics like race and gender, with neighborhood disadvantage being related to increased alcohol misuse among Black men and White women, but reduced misuse among White men (Karriker-Jaffe et al., 2012). Additionally, both concurrent neighborhood disadvantage as well as cumulative exposure over time have profound effects on frequency of consumption and binge drinking (Cerdá et al., 2010), suggesting that the longer individuals are exposed to disadvantaged environments, the stronger the influence of that exposure.

Beyond neighborhood socioeconomic conditions specifically, many of the characteristics related to disadvantage are also associated with

E-mail address: pbarr2@vcu.edu.

alcohol misuse. Neighborhood disorder is independently associated with heavy/hazardous drinking (Hill and Angel, 2005; Kuipers et al., 2012). Alcohol outlet density, which is related to a broad range of alcohol related behaviors (Ahern et al., 2013; Livingston, 2011), is much greater in impoverished areas (Romley et al., 2007), making access to alcohol in disadvantaged contexts much easier. Alongside easier access, part of the relationship between neighborhood disadvantage and adolescent alcohol use is explained by greater exposure to substance using peers (Ying-Chih et al., 2005), a consistent risk factor for adolescent alcohol misuse (Brechtwald and Prinstein, 2011). Therefore, disadvantaged neighborhoods tend to provide a context with increased opportunity for risky behaviors, through easier access to alcohol and exposure to peer substance use.

Relatively little work has examined early exposure to adverse neighborhood conditions or the influence these exposures may have on long-term patterns of alcohol behaviors. Early exposure to neighborhood disadvantage has long-term influences on violent behavior (Karriker-Jaffe et al., 2011), aggression (Karriker-Jaffe et al., 2013), and broader externalizing problems (Wheaton and Clarke, 2003), which are correlated with alcohol use disorders later in life (Kendler et al., 2003). Early life exposure to neighborhood disadvantage is also related to alcohol problems in young adulthood, through the impact that neighborhood disadvantage has on educational attainment and young adult social functioning (Karriker-Jaffe et al., 2018). Given this previous research, we would expect early exposure to neighborhood disorder and/or neighborhood disadvantage should place individuals at greater risk of alcohol use and misuse across the early life course.

It is important to note that while there is evidence of the relationship between neighborhood characteristics (including both disadvantage and disorder) and alcohol misuse, recent systematic reviews of adolescent (Jackson et al., 2014) and adult (Algren et al., 2015) samples suggest that the direction and strength of this relationship is still ambiguous. This ambiguity could be due to a number of factors. First, these reviews combine the results of different levels in severity of alcohol misuse. Additionally, certain aspects of neighborhoods may be more relevant during different periods of the life course. Understanding whether certain neighborhood characteristics have specific influences on different levels in severity of alcohol use and whether this varies as a function of stage in the life course is an important step in understanding this relationship.

In the current analysis, we explore the following research questions using a nationally representative sample of adolescents followed through young adulthood: 1) to what extent do neighborhood conditions, including neighborhood advantage, neighborhood disadvantage, and neighborhood disorder influence trajectories of three alcohol-related behaviors of increasing severity (current drinking status, overall monthly consumption, and heavy consumption); and 2) do these relationships remain after accounting for important risk factors at the individual level? Examining these different outcomes across the early life course allows us to establish what influences aspects of neighborhoods are important for varying stages of alcohol use above and beyond proximal risk factors.

2. Methods

The data for this analysis come from the National Longitudinal Study of Adolescent to Adult Health (Add Health). Add Health participants were selected from a stratified sample of 132 schools resulting in an initial, nationally representative sample of 90,118 students in grades 7–12. Of the original sample, 20,745 were selected for additional in-home interviews. Of those who completed the first in home interview in 1994–1995, 14,738 (71%) completed the second interview in 1996, 15,197 (73%) completed the third interview in 2001–2002, and 15,701 (75%) completed the fourth interview in 2007–2008 (Harris, 2009). The study period covered roughly 14 years between Waves I and IV, providing data ranging from adolescence (11–

18 years old) into young adulthood (24–34 years old). Because the analyses are structured on age rather than the wave of data collection, the analyses cover a twenty-year period of the early life course. Respondents were connected to neighborhood level data drawn from the U.S. Census. We limited analyses to individuals with appropriate survey weights and a valid neighborhood grouping indicator. The final sample included 18,740 individuals spread across 2344 neighborhoods (Mean observation per neighborhood = 7.99, SD = 20.20, Range = 1–275). Results from analyses were robust to inclusion of neighborhoods with extremely large or small numbers of respondents (available on request). Of those included in the current analysis, individuals averaged approximately 3.2 observations of a possible 4 across each alcohol behavior.

2.1. Neighborhood measures

Neighborhood disadvantage/advantage scales were constructed using items from 1990 census data linked to respondents' homes at Wave I, used previously in research with Add Health data (Harding, 2009). Exploratory factor analysis revealed two distinct factors. All items for neighborhood disadvantage (percent in poverty, percent female headed households, percent Black, and percent male unemployment) loaded heavily on a single factor while the remaining measures of neighborhood advantage (percent aged 25 and older with a college degree, percent managerial/professional occupations, percent households earning \$75k or more a year) loaded on another. The scale for both disadvantage ($\alpha = 0.88$) and advantage ($\alpha = 0.93$) demonstrated high reliability. Neighborhood disadvantage and advantage were standardized and coded so that so that greater values reflected greater levels of each.

Neighborhood disorder consisted of items measured at Wave I aggregated to the neighborhood level using the econometrics approach (Mujahid et al., 2007; Raudenbush and Sampson, 1999). Items included ratings from the child, parents, and field interviewer and were made up of perceptions of neighborhood safety, problems, and physical neglect, all of which are related to neighborhood disorder (Sampson et al., 1997). In order to create the scale, we fit a three-level logistic regression with items nested within individuals who were nested within neighborhoods, allowing respondents to contribute observations regardless of whether they had complete responses. Items demonstrated moderate clustering at the neighborhood level (intraclass correlation = 0.22). Neighborhood disorder scores are calculated from the standardized estimates of posterior means at the neighborhood level. Greater values indicated greater levels of disorder. The scale demonstrated relatively high reliability (mean = 0.67, SD = 0.22) based on a weighted comparison of between neighborhoods to within neighborhood variation (Raudenbush and Sampson, 1999). Neighborhood disorder was moderately correlated with both neighborhood disadvantage ($r = 0.66$) and neighborhood advantage ($r = -0.56$) in expected directions, adding to the validity of the measure. A full description of the items and scale creation can be found in [Supplementary materials](#).

2.2. Individual measures

Family socioeconomic status was measured using the scale developed specifically for the Add Health data (Bearman and Moody, 2004), combining mother or father's education and occupational category, yielding a score for each parent from 1 to 10. The final score was determined by whose score (of the mother and father in the case of both parents being present) was higher. *Race-ethnicity* was composed of five categories, of various racial-ethnic groups. Categories were coded so that African-Americans, Asian/Pacific Islanders, Hispanics, and those who identified as "other" were compared to non-Hispanic whites. Those who identified as being multi-racial were categorized under the racial-ethnic identity with which they most strongly identi-

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