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Objective and perceived neighborhood characteristics and tobacco use among young adults

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ABSTRACT

Background: In the US, past month tobacco use is higher among young adults aged 18–25 years than among any other age group. Neighborhood disorder may be a malleable environmental determinant of tobacco use among young adults; its correlation with tobacco use is understudied. The purpose of this study is to examine whether perceived and objectively measured neighborhood factors are associated with tobacco use among young adults in Baltimore City.

Methods: This cross-sectional study of predominately African American young adults ($n = 359$) used logistic regression models via generalized estimating equations (GEE) to estimate the association of perceived and objective neighborhood disorder with past month tobacco use, adjusting for race, age, sex, income, and other substance use. Two measures of perceived neighborhood environment – neighborhood drug involvement, and neighborhood social cohesion – were derived from the Neighborhood Environment Scale (NES). Objective neighborhood disorder was measured via trained field raters using the Neighborhood Inventory for Environmental Typology (NIfETy) instrument.

Results: Sex modified the relationship between perceived neighborhood drug involvement and past month tobacco use, and the association was significant among women only (aOR = 1.49; 95% CI = 1.19–1.88). Perceptions of neighborhood social cohesion (aOR = 0.97; 95% CI = 0.83–1.13), and objective neighborhood disorder (aOR = 1.17; 95% CI = 0.98–1.38) were not significantly associated with past month tobacco use.

Conclusion: Understanding the correlation between perceived and objective neighborhood disorder, and their independent association with tobacco use can potentially lead to environmentally based interventions aimed at reducing tobacco use among young adults who live in urban environments.

1. Introduction

The prevalence of tobacco use is higher among young adults (roughly defined as age 18–25 years old) than for any other age group (U.S. Department of Health and Human Services (USDHHS), 2012). Young adulthood is a particularly critical period for tobacco use (Gilpin et al., 2005). First, 18 is the minimum legal age to purchase tobacco products in the United States (DiFranza, 2012). Second, young adults are subject to less supervision from authority figures, such as parents and school personnel (Arnett, 2000; USDHHS, 2012). Not surprisingly, then, there is a concomitant increase in the prevalence of current tobacco use from mid-late adolescence to young adulthood. Nearly 41% of 18–25 year olds report past month tobacco use, as compared to 10.7% of 12–17 year olds, and 27.2% of persons 26 years old and older (Substance Abuse and Mental Health Services Administration (SAMHSA), 2011). The US Surgeon General's report insists that targeting prevention efforts toward young adults is a crucial next step in tobacco control (USDHHS, 2012). Importantly, those who do not begin tobacco use by young adulthood are unlikely to take it up later in life (USDHHS, 2012).

Developing effective strategies for preventing tobacco use among young adults requires a comprehensive review of the determinants of tobacco use. A recent report from the Office of the Surgeon General organized the determinants of tobacco use into three ecological levels: biological, psychosocial, and social/physical environment (USDHHS, 2012). Relative to biological and psychosocial influences, less is known about the influence of social/physical environment factors on tobacco and other substance use (Lambert et al., 2004).

Research examining the association between tobacco use and the physical environment has used multiple methods of inquiry,

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including: Census data to assess neighborhood economic status, survey research to assess perceptions of neighborhood well-being, and systematic social observation methods to assess neighborhood disorder. Systematic social observation studies employ trained field raters to quantify disorder. Census level factors (e.g., area level poverty, and education level; Diez Roux et al., 2003; Matheson et al., 2011), perceptions of community social cohesion (Patterson et al., 2012), perceptions of neighborhood drug involvement and safety (Lambert et al., 2004), and objective measures of neighborhood disorder (e.g., graffiti and litter; Miles, 2006) have been shown to be significantly associated with tobacco use.

The current study aimed to examine the correlation between objective and perceived measures of neighborhood disorder, as well as the association that each dimension of neighborhood disorder has with tobacco use among young adults. We hypothesized that objective and perceived neighborhood disorder would be correlated, and that living in highly disordered neighborhoods versus neighborhoods with lower levels of disorder would be significantly associated with higher odds of tobacco use.

The study population is made-up primarily of African American young adults living in low-income urban neighborhoods in Baltimore City. This type of population has not been the focus of previous research in this area. Understanding the correlates of tobacco use among African American low-income, urban young adults is important because they are likely to experience higher exposure to tobacco via higher concentrations of tobacco outlets in their communities (Fakunle et al., 2010; Peterson et al., 2011; Rodriguez et al., 2012; Schneider et al., 2005; Yu et al., 2010). Furthermore, marketing effort theories highlight that low-income neighborhoods are more likely to have tobacco advertisements featured prominently throughout the community, which may increase the urge to use tobacco and make it more difficult to quit (Datta et al., 2006; Kendzor et al., 2012; Miles, 2006). Specifically, point-of-sale tobacco advertisements are more common in neighborhoods with a high proportion of African Americans and with a high proportion of low-income residents (Henriksen et al., 2012; Widome et al., 2012).

2. Methods

2.1. Participants

Participants in this cross-sectional investigation were 359 young adults interviewed 1-year post high school in 2006. The analytic sample was derived from a larger cohort study of 799 students who participated in the Johns Hopkins Second Generation Baltimore Prevention Program (BPP) in the first grade. The BPP is a field trial of two universal first grade interventions; respondents were followed through adulthood (Ialongo et al., 1999).

For the current study we included those BPP participants who were residing in Baltimore City 1-year post high school and who had provided their addresses. These restriction criteria were established because objective neighborhood data (i.e., NIfETy data) were only collected for Baltimore City neighborhoods. A total of 597 participants completed the BPP interview 1-year post high school, and 362 of those lived in Baltimore City and had NIfETy data matched to their individual level data. Of the 362 young adults who met inclusion criteria, three were missing information on either the outcome variable (i.e., past month tobacco use) or at least one covariate, and were excluded from the analytic sample.

Participants included in the analytic sample ($n = 359$) did not differ significantly from those who were excluded ($n = 440$) with respect to gender or intervention group. Participants did however differ by race. Participants included in the sample were more likely to be African American than those who were excluded (94% versus 77%; $p < 0.001$). This is due to the fact that residents in Baltimore City are predominantly African American (U.S. Census Bureau, 2013), and the study sample was restricted to participants residing in Baltimore City.

2.2. Data source: Baltimore Prevention Program (BPP)

In 1993, 678 first grade students and their families, representative of the number of students entering first grade in nine public elementary schools in Baltimore City, were recruited to participate in the BPP field trial intervention to evaluate both a classroom-based and family-based intervention aimed at improving academic success, reducing concentration problems, and aggressive and shy behaviors, with a long term goal of reducing risk of substance abuse, depression, and antisocial behavior (Ialongo et al., 1999). Three classrooms from each of the schools were randomized to either of the two interventions arms or the control condition (standard classroom setting; Ialongo et al., 1999). An additional 121 participants transferred into the participating schools after the baseline assessments, for a total of 799. Participants completed annual assessments in grades 1–3, 6–12, and each year post high school until age 25. A description of the original study sample is reported in previous research (Ialongo et al., 1999). The Institutional Review Board at The Johns Hopkins Bloomberg School of Public Health approved data collection for the BPP and NIfETy studies.

2.3. Measures

2.3.1. Outcome: current tobacco use. Current tobacco use was assessed via self-report. Participants who reported having used tobacco within the past month were considered current users. Audio computer-assisted self-interview (ACASI) methods were used to assess tobacco use to promote privacy, and to obtain accurate and complete responses (Furr-Holden et al., 2004).

2.3.2. Correlates of tobacco use. Two facets of neighborhood disorder were explored as potential correlates of past month tobacco use: perceived neighborhood disorder based on participants' perceptions assessed via questions from the Neighborhood Environment Scale (NES), and objective neighborhood disorder assessed by trained raters using the NIfETy instrument.

2.3.3. Perceived neighborhood disorder. The NES was used to evaluate perceived of neighborhood disorder. The NES is a self-reported measurement scale used to summarize perceptions of neighborhood disorder, and includes perceptions about violent crime, and neighborhood drug activity (Crum et al., 1996; Lambert et al., 2004). Based on an exploratory factor analysis (EFA), two neighborhood disorder scales were developed from the NES: a perceived neighborhood drug involvement scale and perceived neighborhood social cohesion scale. Each scale was created by summing the factor loadings of the scale's items when the items were present.

2.3.3.1. Perceived neighborhood drug involvement. Four items loaded together (loadings: 0.591–0.878) on the perceived neighborhood drug involvement scale: (1) I have seen people using or selling drugs in my neighborhood, (2) in the morning or later in the day, I often see drunk people on the street, (3) in my neighborhood, the people with the most money are the drug dealers, and (4) there are people in my neighborhood who have offered me drugs. The fit indices for the EFA were good; the chi-square test for model fit was not significant ($p = 0.166$), indicating that the model fits the data, the Standardized Root Mean Square Residual (SRMR) was 0.028, and the Root Mean Square Error of Approximation (RMSEA) was 0.047 (0.08 > SRMR and 0.06 > RMSEA indicates a good fit; Hu and Bentler, 1998). The coefficient alpha for the total scale used in this study was 0.74.

2.3.3.2. Perceived neighborhood social cohesion. Four items loaded together (loadings: 0.631–0.811) on the perceived neighborhood social cohesion scale. The items were: (1) I like living in my neighborhood, (2) my neighbors would help me in an emergency, (3) my neighbors can tell if someone is a stranger, and (4) the people who live in my neighborhood always take care of each other and protect each other from crime. The fit indices for the social cohesion scale were also good, the chi-square test for model fit was not significant ($p = 0.17$), the Standardized Root Mean Square Residual (SRMR) was 0.021, and the Root Mean Square Error of Approximation (RMSEA) was 0.047. The coefficient alpha for the total scale used in this study was 0.73.

2.3.4. Objective neighborhood disorder. The objective neighborhood disorder scale was derived from the NIfETy instrument, and based on previous investigations (Furr-Holden et al., 2011a,b). The NIfETy instrument is a standardized tool for evaluating characteristics of the neighborhood environment related to violence, alcohol, and other drug (VAOD) exposures (Furr-Holden et al., 2008). Metric properties for the NIfETy instrument are reported in previous research (Furr-Holden et al., 2010). For the current study, trained field raters conducted NIfETy assessments from February 2006 to May 2006 on the block face (e.g., 600-699 Wolfe St.) where young adults lived during the time of their BPP assessment. Eleven items that consistently loaded together (loadings: 0.51–0.90) were used to create the scale: (1) total broken windows, (2) unboarded abandon buildings, (3) unmaintained property, (4) trash in open places, (5) broken bottles, (6) graffiti, (7) noisy, (8) people yelling, (9) public intoxication, (10) drug paraphernalia, and (11) discarded alcohol bottles. The resulting objective neighborhood disorder scale was comprised of the sum of the factor loadings of these 11 items, when the item was present. The coefficient alpha for the total scale used in this study was 0.77.

2.3.5. Covariates. The following covariates were controlled for: race (African American vs. White), age, gender, past month alcohol use, past month marijuana use, and income (i.e., having at least enough money to meet needs vs. not enough). Using ACASI methods, past month marijuana use and past month alcohol use were controlled for because in previous research perceptions of neighborhood disorder differed by drug use status. In one study, people who had not used heroin, cocaine,