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## Young adult perceptions of smoking in outdoor park areas

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### Abstract

**Purpose**—Smoking restrictions in recreational settings are established to promote anti-smoking norms and to reduce exposure to secondhand smoke. Outdoor smoke-free policies are increasing, yet little is known about the perceptions of such restrictions.

**Methods**—Data were collected from a population-based sample of young adults (n=2,289) in upper Midwestern United States. Cross-sectional multivariate logistic regression was used to assess predictors of the perceived difficulty to smoke in outdoor park areas.

**Results**—Living in an area with a smoke-free park policy was associated with a 1.4 times higher odds of perceiving difficulty to smoke compared to those living in an area without such a policy, after controlling for past month smoking, physical activity, age, and gender. Both smokers and non-smokers living in an area with a smoke-free park policy had higher odds of perceiving difficulty to smoking in park areas (OR=1.6 and 1.3, respectively) compared to smokers and non-smokers living in areas without such policies.

**Conclusion**—Banning smoking in parks areas was associated with a heightened perception of difficulty in smoking for young adult smokers and non-smokers.

### Keywords

Young adult; tobacco; policy; secondhand smoke; parks and recreation

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Tobacco control policies intended to reduce exposure to secondhand smoke (SHS) have predominantly been established in indoor environments, particularly worksites. In recent years, outdoor restrictions on smoking in areas outside of work environments have been on the rise, including smoke-free policies at beaches, zoos, parks, and other recreational settings. As of April 2012, nearly 600 communities in the United States have smoke-free policies in park areas (Americans for Nonsmokers' Rights Foundation, 2012). Minnesota was an early leader in establishing smoke-free recreation policies, with 136 such policies

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currently in effect; 85% of these policies were established prior to 2009. (Association for Nonsmokers - Minnesota, 2011)

The 2006 Surgeon General's report noted that there is no safe level of exposure to SHS (U.S. Department of Health and Human Services, 2006). Empirical evidence has been emerging to quantify SHS concentrations and human exposure in various outdoor settings. Air quality studies in outdoor environments including restaurant patio areas, sidewalks and building entrances have consistently demonstrated that concentrations of air pollutants (PM 2.5 and 3.5, in particular) are significantly higher than background concentrations when smoking is taking place (Kaufman et al., 2011, Klepeis et al., 2007, Repace, 2005). Studies have further demonstrated human exposure through testing of salivary cotinine concentrations among non-smokers hospitality workers and patrons using outdoor seating areas of restaurants, bars and/or hotels (Hall et al., 2009, Mulcahy et al., 2005, St. Helen et al., 2012). As Gostin outlined in his review of the criteria to consider in order to justify public health regulation, the growth of the empirical evidence for the potential health risks associated with SHS exposure is a crucial starting point for the justification for policies that restrict smoking behavior (Gostin, 2000). Lastly, although not a primary motivation for banning smoking in outdoor environments, advocates also point out that such restrictions could provide a potential reduction in non-biodegradable waste (Novotny et al., 2009) and reduced fire hazard, as well as reducing opportunities to smoke.

The rationale for smoke-free policies in outdoor environments has focused on two primary concerns -- changing social norms around tobacco to prevent initiation and/or reduce use, and to avoid exposure to SHS. (Klein et al., 2007, Thomson et al., 2009) Policies that restrict smoking are effective means to reduce the visibility of smoking, which has been associated with youth and young adult perceived acceptability (Alesci et al., 2003). Following the adoption of a statewide ban on smoking in all indoor workplaces including restaurants and bars in Minnesota, young adults perception of how difficult it was to find a place to smoke in a restaurant or bar/club increased significantly (Bernat et al., 2010). Youths in Massachusetts had more antismoking beliefs if they lived in a community with strong regulations around tobacco use in multiple domains (Hamilton et al., 2008).

Although the justification for smoke-free policies has focused primarily on potential influence on youth as a target population, young adults are an important population of study, as tobacco use behaviors may still be in transition during this period of life. Although there is a dearth of research examining age differences related to local park usage, generally as age increases, participation in outdoor recreation and physical activity decreases (Payne et al., 2002). A study of outdoor recreation environments found that roughly one-quarter of U.S. young adults (18-24 years) reported use of community trail areas weekly (Librett et al., 2006). These findings suggest that young adults may have more opportunity for exposure to negative role modeling and/or SHS exposure when spending time in parks. Little is known regarding the perception of these policies among young adults, and how local community-level policies may potentially be associated with perceptions. More broadly, tobacco control policies in outdoor environments support prevention and cessation efforts to reduce tobacco use behaviors (Thomson et al., 2009). The objective of the current study was to describe the

perceived difficulty in smoking in park areas among young adults living in areas with and without smoke-free policies in park areas.

## Methods

This study includes data from a population-based cohort study, the Minnesota Adolescent Community Cohort (MACC) Study which drew a stratified random sample of adolescents across the upper Midwestern United States. Starting in 2000, study participants have been phone interviewed twice annually; additional details regarding the study design are published elsewhere (Forster et al., 2011). The present study restricted data to a single round of data collected via telephone interviews between October 2007 and March 2008 (15<sup>th</sup> data round, 71.3% retention rate). The sample (n=2,289) averaged 20.9 years of age (range: 17.8 to 24.2 years), was 51.5% female, and predominantly white (89.7%) with 27% reporting current smoking (see Table 1).

## Measures

The primary outcome measure was defined as those (smokers and non-smokers) who endorsed that it was “very difficult” to find a place to smoke in a park. The independent variables included local city or county smoke-free park policy status based on current city of residence (yes/no), current smoking status defined as any past month smoking (yes/no), age (in years), sex, and self-reporting three or more days of moderate physical activity in the past week (yes/no). Data on the current smoke-free park policies were drawn from a Minnesota-based non-profit organization that promotes tobacco-free youth recreation programming (<http://www.tobaccofreeparks.org/>) that collects and catalogs local policies by date of enactment. The University of Minnesota Institutional Review Board approved the research protocol and participants consented to participate.

## Statistical analysis

Analyses were conducted using multivariate logistic regression to assess whether perceived difficulty smoking in park areas differed by individual characteristics for the total sample, as well as stratified by past month smoking (yes/no). Data were analyzed using SAS 9.2, using  $p<0.05$  to indicate statistical significance.

## Results

Demographic characteristics of this sample (shown in Table 1) are reflective of the demographic profile of Minnesota young adults, with a mean age of 21 years, with slightly less than half male (49%), and predominantly white race. Less than half lived in the Minneapolis-St. Paul metropolitan area (47%), and almost two-thirds lived in an area with a community ban on smoking in park areas (64%).

As shown in Table 2, young adults living in areas with local, smoke-free park policies had a 1.4 times higher odds of perceiving it to be very difficult to find a place to smoke in park areas, compared to those living in areas without a local policy ( $p<0.01$ ). Current smoking was not significantly associated with the perception of great difficulty in smoking in park areas. Younger age and male gender significantly decreased the odds of endorsing a high

degree of perceived difficulty smoking in park areas. After stratification by past month smoking status to directly evaluate any differences by smoking status, both smokers and non-smokers living in areas with a smoke-free park had significantly increased odds of perceived difficulty smoking in park area (OR=1.6, 1.3, respectively), compared to their peers living in areas without smoke-free park policies.

## Discussion

Young adults living in areas with current smoke-free park policies were more likely to perceive that smoking in park areas was very difficult compared to young adults living in areas without such smoking restrictions. Outdoor policies restricting smoking are a more recent tobacco control avenue; this report provides a novel exploration of this relationship in a region with a higher prevalence of policies in place.

These findings are consistent with other studies of young adults demonstrating the presence of a smoke-free policy was associated with high perceived difficulty finding a place to smoke in certain settings (Albers et al., 2004, Bernat et al., 2010, Conley Thomson et al., 2005, Hamilton et al., 2008, Siegel et al., 1999). It stands to reason that smokers may be more likely to be aware of smoke-free park policies due to the direct effect on their behaviors. Yet, the local tobacco use restrictions in parks were also significantly associated with the perceived difficulty of smoking in these locations, suggesting the normative effect on young adults, regardless of smoking status. Given the limited knowledge of outdoor smoke-free policies in parks, more research is needed to understand the mechanism of action between tobacco control policies in outdoor settings and the perceived norms regarding tobacco use.

Previous research in Minnesota established that park directors in areas with a smoke-free policy perceived that smoke-free signage was an important contributor to policy compliance (Klein et al., 2007); smoke-free signage and policy compliance both are likely to independently contribute to the denormalization of smoking in this setting. Perceived enforcement of school tobacco policy was found to be directly and positively related to perceived community smoking norms (Lipperman-Kreda et al., 2009), suggesting that the perceived compliance plays a powerful role in these norms. Limited data on compliance with outdoor area policies restricting smoking have suggested good to very good compliance after policy introduction (Giles-Corti et al., 2001, Harris et al., 2009). Future studies could explore the compliance rates and enforcement methods reported by park officials through direct observation of park user behaviors or through novel methods such as geographic patterns of cigarette waste within the outdoor environment (Marah et al., 2011).

There are limitations to the current study, as it presents a cross-sectional evaluation of the perception of difficulty of smoking in park areas; therefore a causal association cannot be confirmed. In addition, a cross-sectional analysis does not allow for the exploration of the relationship between duration of exposure to the local park policy and other behaviors; future longitudinal studies could assess this relationship especially as young adults may move between communities with differing policies in place. Data regarding policy enforcement were not collected, although previous research found a high degree of policy

compliance reported from park officials in Minnesota (Klein et al., 2007). Physical activity served as a proxy for park usage in this study, and may not accurately represent time spent in local parks; future research could benefit from direct observation or self-report of park usage frequency. As an additional limitation, there may be ambiguity in the interpretation of the meaning of the question regarding perceived difficulty in smoking; future studies should clarify whether the perception of smoking difficulty is associated with the perception of enforcement and/or penalties for smoking in these locations.

Nationally, smoking restrictions in outdoor environments are considerably less common than indoor air restrictions. Our study results suggest that smoke-free park policies are significantly associated with the perceived difficulty of smoking in local parks. These policies, along with other tobacco control efforts in indoor environments, help to contribute environmental barriers to tobacco use behaviors. While debate continues over the empirical evidence and philosophical justification for bans on smoking in outdoor environments (Chapman, 2008, Thomson et al., 2008), many communities have smoke-free park policies adopted or under consideration. In their 2009 review of reports on public support for smoke-free parks, Thomson et al. concluded that levels of public support for such policies were high, which creates an opportunity to establish smoke-free outdoor public places, such as recreational park areas (Thomson et al., 2009). The research on outdoor smoke-free policies should continue to expand the empirical base for the effects these policies as a public health intervention for SHS exposure reduction and tobacco denormalization for youth and young adults.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Table 1**

Descriptive characteristics of young adults: The Minnesota Adolescent Community Cohort (MACC) study

<b>Sample description (n=2,289)</b>	<b>Total (n)</b>
Mean age, in years (SD)	20.9 (1.7)
Male	48.5% (1110)
White ethnicity	89.7% (2054)
Residence in 7 county Twin Cities metropolitan area	46.6% (1067)
Residence in a community with a smoke-free park policy	64.2% (1469)
Current smoker	27.0% (616)
Other household member is a current smoker	22.5% (515)
Ban on smoking in the home	78.4% (1789)
Believe "most adults smoke cigarettes"	13.6% (308)
Mean days of past week moderate physical activity (SD)	2.7 (2.3)



**Table 2**

Predictors of perceived difficulty to smoke in park areas for the total sample of young adults, and stratified by smoking status

	Total sample (n=2,282) *	Past month smokers (n=616)	Past month non-smokers (n=1,666)
Description	Odds Ratio (CI)	Odds Ratio (CI)	Odds Ratio (CI)
Residence in a community with a smoke-free park policy	<b>1.38 (1.16 – 1.64)</b>	<b>1.58 (1.13 – 2.21)</b>	<b>1.32 (1.08 – 1.62)</b>
Past month smoking	1.18 (0.97 – 1.42)	--	--
Being male	0.94 (0.78 – 1.12)	<b>0.92 (0.84 – 0.99)</b>	<b>0.91 (0.87 – 0.96)</b>
Age (in years)	<b>0.92 (0.88 – 0.95)</b>	0.99 (0.85 – 1.09)	<b>0.93 (0.87 – 0.98)</b>
Physically active at least 3 days/past week	<b>0.94 (0.89 – 0.99)</b>	0.85 (0.59 – 1.21)	0.97 (0.79 – 1.19)

**Bold type** indicated  $p < 0.05$

\* Total sample size reduced due to missing data for one or more covariates (n=7)