## Section III
## Interpersonal and Contextual Factors That Contribute to Tobacco-Related Health Disparities

# Chapter 6
# Social Relationships and Tobacco-Related Health Disparities

## Contents



## Figures and Tables

## Introduction

The link between social relationships and health outcomes is well established.[1–6] Prospective studies in diverse cultural settings have shown that people who are integrated into supportive social networks are at reduced risk of all-cause mortality and disease-specific mortality[1,3–5] and have fewer biomarkers of disease.[4] Although social relationships can influence health outcomes via several pathways, health behaviors (including tobacco use) represent a major mediating mechanism through which these influences can occur. Social relationships are relevant at all stages of the tobacco use continuum, the causal pathway in the progression of smoking to disease which includes initiation, current use and intensity, intentions to quit and quit attempts, cessation, relapse, and tobacco-related morbidity and mortality. They influence the risk of early experimentation with tobacco and progression to higher levels of tobacco use, as well as the likelihood of successful smoking cessation.[7] Although numerous studies have shown strong associations between social relationships and health outcomes and have identified tobacco use as a significant mediator of those associations, few of these studies have focused on the role of social relationships in creating or exacerbating disparities.

Several review articles have summarized the cross-sectional and longitudinal associations between aspects of social relationships—including structural aspects such as social network structure, and functional aspects such as social influence, social control, and social support—and various tobacco-related behaviors such as early experimentation with smoking, progression to nicotine dependence, and smoking cessation.[8–20] However, these reviews have not focused on the associations between social relationships and tobacco-related behaviors and variations across sociodemographic groups (i.e., racial/ethnic groups, socioeconomic status [SES] groups, and sexual orientation groups). Because social relationships are so closely linked to tobacco use in general, it is likely that they are also involved to some extent with the development and maintenance of tobacco-related health disparities (TRHD). This chapter reviews the evidence on how social relationships can create or exacerbate TRHD across racial/ethnic groups, SES groups, and sexual orientation groups.

## Social Relationships and Disparities Across the Tobacco Use Continuum

The broad term "social relationships" encompasses both *structural* and *functional* characteristics of an individual's social network.[21] The structural aspect represents the person's position in a social network, including the number of ties with other people in the network, the strength of those ties, and interconnections among those ties. The functional aspect represents the social interactions that occur across those ties. The nature, source, amount, and relative importance of structural and functional characteristics likely vary across racial/ethnic groups, SES groups, and sexual orientation groups. This chapter will review how structural and functional characteristics of the social network can influence TRHD.

### Structural Characteristics of Social Relationships

Structural characteristics of social relationships include measures of social integration, such as the number of social ties from an individual to other individuals and groups and the interconnections among those ties. People with numerous, densely connected social ties are considered highly socially integrated, popular, or central. People with few or no social ties are considered socially isolated.[22]

Structural aspects of social networks have been shown to influence tobacco use behavior across the tobacco use continuum and throughout the life course. Studies of adolescents have found that popular

students and, conversely, socially isolated students, are at increased risk of smoking.[22] Social isolation also has been associated with smoking among middle-aged adults[23,24] and older adults.[25] The contagion effects of smoking (i.e., smoking behavior spreading like a virus from one person to another) have been documented using social network analyses. Research indicates that smoking behaviors can be spread through close and distant social ties and that smoking initiation and cessation patterns typically occur at the same time among interconnected groups of people.[26,27]

### Functional Characteristics of Social Relationships

The functional mechanisms by which social relationships influence health can be divided into three broad categories: (1) social influence and social comparison, (2) social control, and (3) social support.[21]

The first category, *social influence and social comparison*, refers to the process by which people adjust their own behavior to conform with the behavior of others. People make social comparisons with similar others to obtain guidance about which behaviors are normative and which behaviors are likely to be socially reinforced.[28] Although social influence and social comparison processes could operate at any point in the tobacco use continuum, they can be especially relevant during the early stages of smoking uptake. Smoking initiation typically occurs during adolescence and young adulthood, when conformity to peer norms and acceptance by peers are especially salient. Through social learning processes, nonsmokers observe their friends and family members receiving or not receiving social, physical, or emotional reinforcement after smoking; if such reinforcement occurs they may then emulate the smoking behaviors with the expectation of receiving the same reinforcement. Although any member of an individual's social network can exert social influences to smoke or not to smoke, social influences typically originate from close relationships with admired and/or similar individuals.[29]

After smoking has become a behavior that is maintained by physiological dependence on nicotine, social influence and social comparison processes might become less important. However, these processes could still influence other smoking-related behaviors, such as the types or brands of tobacco used (e.g., menthol cigarettes, dual use of cigarettes and other tobacco products), the settings in which smoking occurs, and the likelihood and timing of cessation attempts. Smokers might look to their peers, people they admire, or the idealized images in cigarette advertisements to decide which cigarette brands are consistent with the self-image they wish to project.[30] Although numerous studies have documented social influences on tobacco use, a smaller subset of those studies has focused on social influences as a contributor to TRHD.

The second category, *social control*, refers to explicit attempts by social network members to encourage people to practice healthy behaviors.[31] Social control is a mechanism to influence the individual to engage in normative, non-deviant behavior; in the health behavior context, social control is viewed as a mechanism to encourage healthy (normative, non-deviant) behavior.[31] Social control of smoking can be a direct (e.g., a spouse or child convincing a smoker to quit) or indirect (e.g., a smoker autonomously deciding to quit to be able to fulfill obligations to family members).[32] Early in smoking uptake, social control can occur when parents forbid their children from smoking or establish no-smoking rules in the home. At later stages of use, social control can occur when social network members encourage the smoker to quit or to refrain from exposing others to secondhand smoke. Social control generally moves people in the direction of performing healthier behaviors, although it can have the opposite effect if it is perceived as overly intrusive and creates reactance.[21]

The third category, *social support,* can be subdivided into emotional support (e.g., caring, empathy, commitment), informational support (providing information about resources and services), and instrumental support (performing actions that facilitate the individual's behavior change) to promote health and well-being.[21] Social support may be especially helpful to disadvantaged populations in facilitating smoking cessation[33]; social network members can provide encouragement and empathy during the quit attempt (emotional support); offer information about smoking cessation strategies and resources (informational support); and/or perform actions that facilitate cessation efforts, such as driving the smoker to appointments or purchasing pharmacological cessation aids (instrumental support).

In addition to the functional aspects of social relationships described by Thoits,[21] this chapter also focuses on *discrimination* as a social influence. Discrimination encompasses a variety of negative social interactions experienced by disadvantaged and minority populations. It refers to differential treatment based on one's membership in a minority or disadvantaged group. Discrimination includes overt acts, such as name-calling, violence, harassment, or discourteous treatment, as well as more subtle microaggressions, such as speaking in a manner that implies that a person is uneducated, unintelligent, or untrustworthy.[34,35]

Discrimination is included as a social influence in this chapter because numerous studies have identified associations between discrimination and smoking among adults[36–45] and youth.[46–48] Discrimination is far more common among members of disadvantaged groups; the prevailing perspective is that the stress reaction to discriminatory experiences primarily explains its association with smoking among these groups.[42,49] Further discussions of the associations between discrimination and smoking among adults are presented in chapter 5.

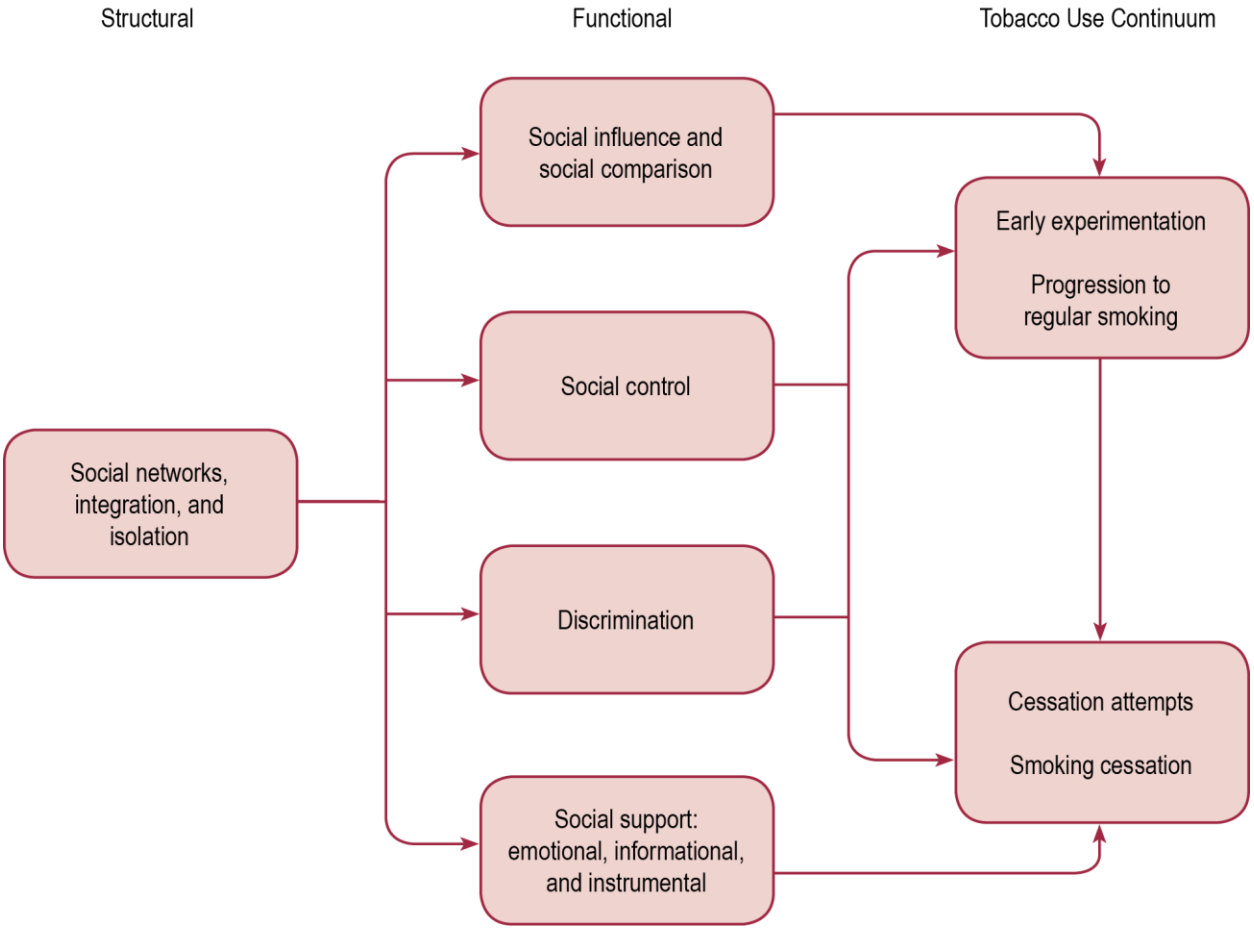
Discrimination could be conceptualized as a structural characteristic of social relationships rather than as a functional characteristic, because discrimination can cause specific individuals to be excluded from social networks, preventing them from receiving social influences, social control, or social support from those networks. However, this chapter conceptualizes discrimination as a functional characteristic because most of the studies of discrimination and tobacco use have examined associations between an individual's perceptions of discrimination and his or her tobacco use behaviors, without considering the potential mediating influences of exposure to social networks. This is an interesting direction for future research, but the pathway from discrimination to social network structure to tobacco use is likely to be difficult to disentangle.

### The Tobacco Use Continuum and Social Relationship Characteristics

In general, research has focused on the social relationship factors thought to be most relevant for particular stages of the tobacco use continuum. For example, nearly all the research on social relationships and early experimentation has focused on social influence and social comparison processes; little research has focused on social support as a predictor of experimentation. Conversely, nearly all the research on social relationships and smoking cessation has focused on social support and social control; little smoking cessation research has focused on social influence and social comparison. Discrimination has been examined in relation to lifetime and recent smoking among adolescents and in relation to current smoking among adults, but its role in the other stages of the tobacco use continuum has not been thoroughly addressed. The available research becomes even more limited when it is restricted to studies that also examine disparities.

This chapter focuses primarily on the pathways between social relationships and behaviors along the tobacco use continuum, as shown in Figure 6.1.

### Figure 6.1 Influences of Social Relationships Across the Tobacco Use Continuum




## Social Relationships and TRHD: Two Types of Mechanisms

Causal mechanisms by which social relationships can give rise to TRHD can be seen as falling into two broad categories: (1) simple differences in the prevalence of risk and protective factors and (2) moderator effects.

Simple differences across groups in the prevalence of risk and protective factors can lead directly to differences in the prevalence of smoking. For example, if members of one racial/ethnic group, SES group, or sexual orientation group experience more social influence that supports smoking than members of another group, the group experiencing more social influence to smoke would be expected to engage in more tobacco use, which would lead to TRHD. If another group receives less social support to quit smoking, that group might have fewer quit attempts. This approach assumes that the effect of a given social interaction on smoking behavior is similar across groups, which may or may not be true. Moderation effects make it possible to test this assumption.

Moderation effects occur when the effects of a given risk factor are stronger among one group than among another group. If one group is more susceptible to a given risk factor, and another group is more resilient to the same risk factor, the risk factor will result in more smoking among the susceptible group than among the resilient group. For example, if a specific group is especially vulnerable to social influences to smoke, the same level of social influence would cause more smoking among that group than among another group that is more resilient to social influences. The most rigorous test of such a moderation effect would be a study that assesses statistical interactions between social influences and group membership in the prediction of tobacco-related outcomes. For example, a study of the effect of family support on smoking cessation outcomes could recruit smokers of diverse racial/ethnic and SES groups and directly test whether the strength of the association between family support and smoking cessation is significantly different across groups. However, to date, most published research has focused on a single demographic group (e.g., moderate-income African Americans) rather than comparing across racial/ethnic and SES groups. This chapter reviews studies that concentrate on single groups, but it focuses on studies that make explicit comparisons across groups, because those studies are most informative about disparities.

## Measures of Social Relationships and Tobacco Use

The methods for measuring social relationships vary widely across studies; this fact makes comparisons across studies difficult and precludes a formal meta-analysis. This section describes the measures of structural aspects of social relationships (social networks) and functional aspects of social relationships (social influence and social comparison, social control, social support, and discrimination) that have been used most frequently in studies of tobacco use and TRHD.

### Social Network Structure

Formal social network analysis techniques[50] can be used to diagram an individual's social network, quantify his or her position in the social network and connections with other members of the network, and examine similarities in behavior among members who share social ties.[51] In this social network approach, researchers typically collect data from a closed system of individuals (e.g., classroom, school, workplace) and survey all members of the system about their smoking and their social relationships with other members of the system. For example, school-based studies[22] have asked students to report their smoking behavior and list the other students in the school who are their friends. The matrix of nominations can be used to calculate the number of friends each student nominated, number of friend nominations each student received, and the structure of interconnections among the friends. The friends' self-reports of their own smoking behavior also can be used to examine each student's exposure to smoking peers and the diffusion of smoking behavior throughout the social network.

One advantage of this method is that it removes the problem of respondents misperceiving their peers' behavior, because the social influence data are obtained from the peers themselves. Although this method can yield more accurate data on the peers' behavior, it omits the possible social influences from people not nominated by the respondent as friends and from people who were nominated as friends but did not provide data. It also omits influences from social network members who are outside the closed system under study (e.g., friends who attend different schools).

### Social Influence and Social Comparison

Social influence is typically defined operationally in tobacco use survey research as the number of people in the respondent's social network who smoke or approve of smoking. The most practical way to assess social influence in a survey is simply to ask the respondents how many of their friends or family members smoke. For example, the National Youth Tobacco Survey (NYTS)[52] asks, "How many of your four closest friends smoke cigarettes?" and the National Longitudinal Study of Adolescent to Adult Health (Add Health)[53] asks, "Of your 3 best friends, how many smoke at least 1 cigarette a day?" Some adolescent surveys also ask whether the respondent's parents and/or siblings smoke. Adult surveys typically ask how many of the respondent's household members and friends smoke. For example, the International Tobacco Control Survey[54] asks, "Does your partner or spouse currently smoke?" The National Adult Tobacco Survey[55] and several statewide tobacco surveys ask, "How many of your friends use any tobacco products?"[56]

These measures are based on an assumption that mere exposure to people who smoke is sufficient to influence the respondent's smoking behavior. They do not assess other theoretically important aspects of the social learning process, such as whether the respondent witnessed the smoker receiving reinforcement for smoking[29] or whether the respondent is motivated to comply with perceived social norms.[57]

### Social Control

Social control can include a variety of behavioral attempts to constrain an individual's smoking behavior. The nature of the social control likely depends on the relationship between the smoker and the person exerting the social control. A parent might exert social control on a child by forbidding or punishing the child's smoking. A child might exert social influence on a parent by asking the parent not to smoke. If the relationship is between spouses, friends, or people of equal status, the social control might involve advising or pressuring the person to quit smoking.

Measures of adolescents' perceptions of social control against smoking typically ask about their parents' rules about smoking. For example, the NYTS[52] asks, "Which statement best describes the rules about smoking inside your home? Smoking is not allowed anywhere inside my home. Smoking is allowed in some places or at some times. Smoking is allowed anywhere in my home. There are no rules about smoking in my home." Measures of social control among adults also include questions about rules against smoking in the home or workplace and questions about whether the respondent was asked not to smoke. For example, the California Adult Tobacco Survey includes the question, "About how many times in the past 12 months has anyone asked you not to smoke when you were smoking or were about to smoke?"[56]

### Social Support

Numerous measures of social support exist, and several comprehensive articles and books describe their theoretical perspectives and psychometric properties. Some studies of social support and smoking have measured general social support, and others have measured social support specific to an individual's efforts to quit smoking. General social support scales typically include measures of frequency of social interaction, the perceived availability of support and help in times of crisis, satisfaction with social support, membership in social groups, and the availability of confidants.[58–60] Measures of social support specific to smoking cessation[61–63] ask whether a spouse, partner, or other social network member

performed behaviors that were supportive (e.g., complimented you on not smoking, congratulated you for your decision to quit smoking) or unsupportive (e.g., criticized your smoking, commented on your lack of willpower). In addition to the specific actions the partner performed, it is also important to assess the extent to which the smoker perceived those actions as helpful or unhelpful.[64] The social support literature has drawn a strong distinction between received support (occurrence of specific supportive actions) and perceived support (perceptions of the availability of support)[65]; however, this distinction has rarely been discussed in the literature on social support for smoking cessation.

### Discrimination

Although many different survey measures have been used to assess discrimination,[66] most studies of discrimination and smoking focus on individuals' perceptions of everyday hassles and negative social interactions that are based on the individuals' membership in one or more minority groups. For example, the Everyday Discrimination Scale[67] asks about such experiences as being treated with less courtesy or respect and receiving poorer service at restaurants. The Behavioral Risk Factor Surveillance System Reactions to Race module assesses perceived discrimination by asking whether the individual was treated worse than, the same as, or better than people of other races while seeking health care and being in the workplace. When using these measures, it is important to remember that individuals likely differ in the extent to which they attribute these events to discrimination or to other factors unrelated to their minority status. For example, some people will attribute a waiter's poor service to discrimination, whereas others will attribute it to the waiter's incompetence or workload. More research is needed to determine how individuals' personalities, past experiences, and social contexts influence the extent to which they attribute negative experiences to discrimination.

## Literature Search Strategy

A literature search was conducted in PubMed, Google Scholar, and PsycINFO® to gather research on the role of social relationships in TRHD. Key search terms included smoking, tobacco, or cigarette; minority, disparity, race, racial, ethnic, ethnicity, socioeconomic, income, gay, lesbian, bisexual, transgender, LGBT, homosexual, heterosexual, or sexual orientation; Hispanic, Latino, African American, black, or Asian; social, peer, friend, sibling, spouse, parent, family, discrimination, or social network.

Searches were limited to studies conducted with U.S. samples, published in English through 2011, and involving humans. The searches yielded 3,498 articles. An examination of the abstracts of these articles revealed 442 potentially relevant articles, which were then examined for potential inclusion in this chapter. Articles were included if they addressed disparities across racial/ethnic, income, or sexual orientation groups regarding the association between social relationships and smoking. A total of 84 studies met this criterion.

## Social Network Structure and Smoking

### Adolescents

Although several studies have found that popular adolescents, those with numerous, densely connected social ties, are more likely to smoke,[27,68] studies have also found that socially isolated adolescents are more likely to smoke.[69,70] Other studies have found complex curvilinear associations between popularity and smoking[71] or complex interactions between popularity and other measures of social network

position.[72] Although several studies have examined associations between social networks and smoking, most of those studies have not assessed disparities in those associations. A recent review of 10 school-based studies of social networks and adolescent smoking concluded that adolescents who are socially isolated are at increased risk for smoking.[70] However, this review did not address disparities concerning the association between social isolation and smoking, and most of the studies reviewed were conducted among predominantly white, average-SES samples. The few social network studies that focused on vulnerable populations are reviewed below.

A study of a multiethnic sample of middle school students in Los Angeles (56% Hispanic, 27% Asian American, and 23% white)[27] found that the positive association between popularity and smoking was significant among Hispanic students but not among other racial/ethnic groups. When the sample was stratified by ethnicity and gender, popularity was a significant predictor of susceptibility to smoking only among Hispanic girls. However, because Hispanics represented more than half of the sample, there may not have been sufficient statistical power to detect associations between popularity and smoking among the other racial/ethnic groups.

One study[73] assessed social network influences on smoking among a predominantly Hispanic sample of students attending an alternative high school. Although low-SES students are overrepresented at alternative schools, students attend alternative schools for numerous reasons (e.g., disciplinary problems, pregnancy, work schedules that preclude attendance at traditional schools), so not all students in this study were in the low-SES group. In this study, 54% of the students had mothers with less than a high school education, suggesting they are from low-SES households. In this sample, 40% of students reported past-month smoking, and the most consistent predictor of past-month smoking was in-degree centrality (the number of other students who nominated the respondent as a friend, which is an indicator of popularity). These findings suggest that the association between popularity and past-month smoking may generalize to low-SES Hispanic students in a high-risk social context.

A study of Hispanic 8th-grade students at a single low-SES middle school in Los Angeles found that students who spoke Spanish with more of their social network members were less likely to have social network members who used substances, and lower substance use among the social network members was associated with lower substance use among the respondents.[74] However, this study used a composite measure of tobacco, alcohol, and other drugs, so it is not clear whether social network characteristics were specifically associated with tobacco use in this sample. In addition, the significant predictor of substance use in this study was the number of Spanish-speaking friends, not the number of friends overall, which suggests that acculturation could have confounded or moderated the association between social networks and substance use. Acculturation is discussed in more detail in chapter 7.

A large longitudinal study found that among white and African American adolescents, those who were socially isolated in 7th grade were at increased risk of being smokers in 11th grade.[69] The association between social isolation and smoking was similar among whites and African Americans. However, the exact nature of this association is difficult to determine because social isolation was defined as a lack of several different types of social support, including satisfaction with the level of popularity and other related constructs.

### Adults

Most of the research on sociometric position and smoking has focused on adolescents. The few studies that have examined this association among adults have not examined disparities or minority populations. For example, an analysis of the Framingham Heart Study data from 1971 to 2000[26] showed that connected clusters of smokers within a large social network tended to quit smoking around the same time. However, the Framingham sample was predominantly white and middle class, so this study does not provide information about disparities, and few other studies of smoking among adults include assessments of entire social networks. A study of changes in smokers' social networks after a quit attempt found that quitting was associated with a shift to a larger social network and to less contact with and exposure to smokers; the sample was predominantly white (83%) and majority female (58%), so differences by race/ethnicity and other demographic factors could not be determined.[75] Similarly, no studies have examined differences across racial/ethnic or lesbian, gay, bisexual, and transgender (LGBT) groups in the association between sociometric position and smoking behavior among adults.

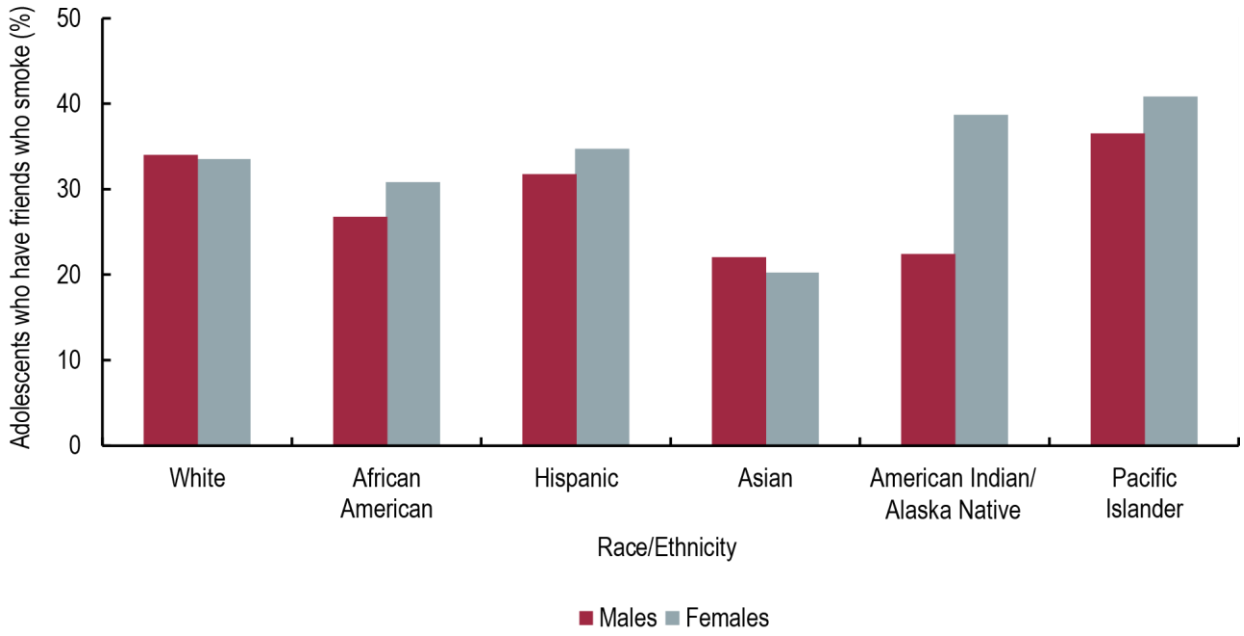
## Social Influence, Social Comparison, and Smoking

### Adolescents

#### *Disparities in the Prevalence of Peer Influences on Smoking*

Various studies have provided data on the proportion of adolescents who report that they have friends who smoke; however, many are not nationally representative. Figure 6.2 shows nationally representative estimates from the 2013 NYTS of the proportion of adolescents who have one or more friends who smoke.[52] The proportion of adolescents who had at least one friend who smoked varied across racial/ethnic groups. Pacific Islander adolescents were most likely to have a friend who smoked (38%), followed by whites (34%), Hispanics (33%), African Americans (29%), American Indian/Alaska Natives (28%), and Asians (21%). Information is not available on the proportion of adolescents, by sexual orientation or SES, who have friends who smoke.

**Figure 6.2 Percentage of Adolescents Who Report Having One or More Friends Who Smoke, by Race/Ethnicity and Gender, 2013**




*Source:* Centers for Disease Control and Prevention 2013.[52]

### *Disparities in the Prevalence of Family Social Influences*

Although nationally representative data are not available on how many adolescents report having parents or other family members who smoke, data are available on how many adolescents live with a smoker. In the 2013 NYTS,[52] American Indians/Alaska Natives were most likely to report that they lived with a smoker (35%). The proportion of adolescents who lived with a smoker was lower among other racial/ethnic groups (whites: 33%; African Americans: 29%; Hispanics: 28%; and Asians: 25%), despite the fact that the prevalence of smoking among adults varies more across these racial/ethnic groups.[76] Data are not available by sexual orientation.

### *Disparities in the Strength of Peer Influences on Smoking Initiation and Progression*

The literature presents conflicting evidence regarding racial/ethnic differences in the effect of friends' smoking on adolescents' experimental smoking behaviors. Several studies have examined associations between friends' smoking and adolescent smoking in multicultural samples. The vast majority of these studies have found that friends' smoking is a very strong predictor of smoking initiation and progression across all racial/ethnic groups studied.[77–81] These studies did not report significant differences across racial/ethnic groups in the strength of the association between friends' smoking and respondents' smoking.

Other studies have found differences across racial/ethnic groups in the strength of peer influences on adolescent smoking. Landrine and colleagues[82] found that peer smoking was a strong predictor of smoking among white adolescents, accounting for 23.5% of the variance, but it explained a much smaller proportion of the variance in smoking among Hispanic, Asian American, and African American adolescents. An analysis of the Add Health Wave III data[83] on participants whose average age was 21.8 years found that friends' smoking was associated with ever-smoking and nicotine dependence

among white young adults (odds ratio [OR] 1.97; 95% confidence interval [CI] 1.60–2.40) and Hispanic young adults (OR 2.12; 95% CI 1.30–3.50) but not among African American young adults. In a large sample of California adolescents, whites were more likely than Chinese Americans to initiate smoking if their friends smoked, although the effect was significant for both.[84] In a longitudinal study of the predictors of change in smoking status from 7th to 12th grades,[69] friends' smoking was a risk factor for progression from never-smoking to monthly smoking among whites and African Americans; however, African Americans were at risk for smoking if only a few of their friends smoked, whereas whites were at risk for smoking if most of their friends smoked. Several other studies have found that the association between friends' smoking and adolescent smoking is stronger among whites than among African Americans.[81,85,86]

Studies also have examined racial/ethnic differences in the association between perceptions of peer norms and adolescent smoking. Perceptions of peer norms represent a more generalized, albeit more speculative, measure of social influence. These measures ask adolescents to estimate the percentage of their peers who smoke, their perceptions of the pressure to smoke, or their perceptions of the acceptability of smoking among their general peer group. Analyses of the National Longitudinal Survey of Youth (NLSY) data[87] found that perceived peer pressure to smoke was a risk factor for smoking among whites (OR 20.4; $p \leq 0.001$) and Hispanics (OR 6.1; $p \leq 0.05$) but not among African Americans. However, analyses of the Add Health data[88] found that perceived peer pressure to smoke predicted smoking initiation equally among white, African American, and Hispanic adolescents. Siddiqui and colleagues[89] found that the association between peer approval of smoking and adolescent smoking was stronger among whites than among African Americans, Hispanics, and Asians. A study of adolescents from four Asian American groups in California[90] found that the association between perceived peer norms about smoking and smoking behavior was significant and consistent across Asian groups and genders.

Prior summary reports, including both the 1994 Surgeon General's report, *Preventing Tobacco Use Among Young People*,[91] and the 2012 Surgeon General's report, *Preventing Tobacco Use Among Youth and Young Adults*,[7] have concluded that adolescents are more likely to smoke if they have friends who smoke. For example, *Preventing Tobacco Use Among Youth and Young Adults* concluded that "the evidence is sufficient to conclude that there is a causal relationship between peer group social influences and the initiation and maintenance of smoking behaviors during adolescence."[7,p.460] While the causal mechanisms are not fully understood, the association is likely due to a combination of peer influence (i.e., adolescents smoking because their friends exert informational or normative influences for them to smoke), and peer selection (i.e., adolescents selecting friends with similar smoking behaviors).[11,16]

Several studies have found that peer influence effects are stronger among whites than among most racial/ethnic minority groups. African American adolescents, in particular, appear to be affected less strongly by peer influence to smoke. However, there is inconsistency across studies regarding racial/ethnic differences in the effects of peer influence. No studies were identified that examined differences in peer effects on adolescent smoking across sexual orientation or SES groups.

### *Parental Influences on Adolescent Smoking*

Studies have reported both similarities and differences across racial/ethnic groups in the strength of the association between parents' smoking and adolescent smoking. An analysis of the Add Health Wave I and II data[81] found that parents' smoking was a risk factor for transition from ever-smoking to daily

smoking among whites, African Americans, and Hispanics over a 1-year period; however, there were no significant ethnic differences in this association, and parents' smoking did not predict smoking initiation among never-smokers. A later analysis of the Add Health Wave III data (participants' mean age was 21.8 years)[83] found that parents' smoking was a risk factor for lifetime nicotine dependence among whites (OR 1.89; 95% CI 1.43–2.49) and Hispanics (OR 2.02; 95% CI 1.02–4.02) but not among African Americans. However, parents' smoking was not a significant predictor of ever-smoking in this sample. Another analysis of the Add Health Wave II data that focused on mothers' influences on girls[92] found that mothers' smoking was a risk factor for adolescent girls' smoking among whites but not among Hispanics or African Americans. Similarly, an analysis of data from the 1992 NLSY[87] found that mothers' smoking was associated with greater adolescent lifetime smoking among whites but not among African Americans or Hispanics. Other analyses of large, nationally representative samples of adolescents[88,93] and smaller, more in-depth studies of geographically localized samples[78,94] have found that the positive association between parents' smoking and adolescents' smoking was similar across racial/ethnic groups.

Most studies have not had sufficient statistical power to include Asian Americans as a separate category in analyses of racial/ethnic differences as predictors of smoking. An analysis of California data[84] found that the positive association between parents' smoking and adolescent smoking initiation was stronger among Chinese Americans (relative risk [RR] 3.01; $p \leq 0.003$) than among whites (RR 1.68; $p \leq 0.001$). It is not known whether the association between parental smoking and adolescent smoking varies across SES groups or by sexual orientation.

### Adults

Most studies of social relationships and smoking cessation among adults have focused on social networks, social control, or social support rather than social influence. These studies are reviewed elsewhere in this chapter in the corresponding sections.

## Social Control and Smoking

### Adolescents

Social control by parents includes communicating with children about not smoking, prohibiting them from smoking, or restricting their access to cigarettes. A review of 19 studies[95] concluded that the evidence suggests that parental rules against household smoking reduced adolescent smoking behaviors; however, the reviewed studies did not focus on differences by race/ethnicity or other variables.

One line of research on parental social control on adolescent smoking has explored the hypothesis that African American parents feel more empowered than parents of other races/ethnicities to prevent their children from smoking, and that they are more likely to set and enforce clear rules against smoking.[14,94,96,97] Therefore, even if African American parents are smokers, they might be more likely to limit their children's smoking with firm rules. Differences in parenting practices and rules about smoking could protect African American youth from experimenting with smoking, even in the presence of other risk factors.

If African American parents are more likely to set and enforce rules against smoking, one might expect the associations between parental monitoring and no-smoking rules and adolescent smoking to be stronger among African Americans than among other groups. However, several large studies have

reported opposite findings. For example, Bohnert and colleagues[98] conducted a study in southeast Michigan and found that parental monitoring was protective against smoking initiation between ages 11 and 17 among white adolescents (OR 0.89; 95% CI 0.83–0.96) but not among African American adolescents (OR 0.98; 95% CI 0.93–1.04). A cross-sectional analysis of the Add Health Wave I sample produced a similar finding: Parental control was protective against smoking among white adolescents but not among African American adolescents.[99] It is possible that commonly used parenting measures do not adequately capture parental monitoring related to tobacco use. More research is needed to understand the specific smoking-related messages that parents of different racial/ethnic groups convey to their children, how children perceive these messages, and how these messages influence children's tobacco use behaviors.

Several other studies have compared the associations between parenting practices and adolescent smoking in racial/ethnic groups other than African Americans and whites. Shakib and colleagues[100] reported on several such associations, finding that parental monitoring was more protective against smoking among whites (OR 0.30; 95% CI 0.15–0.60) than Hispanics (OR 0.68; 95% CI 0.54–0.85), and that adolescent communication with parents was more protective among Hispanics (OR 0.63; 95% CI 0.50–0.78) than whites (OR 1.48; 95% CI 0.70–3.13). Neither parental monitoring nor communication was significantly associated with smoking among Asian Americans. Another study[87] found that positive parenting practices (monitoring and closeness) were protective against lifetime smoking among white (OR 0.6; $p \leq 0.001$) and African American adolescents (OR 0.5; $p \leq 0.001$) but not among Hispanics.

Home smoking bans protect family members, including infants and children, from the serious health hazards of exposure to SHS[101] and reduce youth smoking and progression from initiation to regular smoking.[7,102,103] For this reason, the American Academy of Pediatrics supports promoting smoke-free homes.[104] However, as noted in the 2012 Surgeon General's report, "more information is needed on how home smoking policies vary by sociodemographic characteristics."[7,p.709]

### Adults

Studies conducted among the general population have shown that people with home smoking bans are less likely to be smokers, and smokers with home smoking bans are more likely to make cessation attempts.[105] Low-income families are less likely to have home smoking bans,[106–108] so low-income smokers might be less likely to experience this type of social control.

Only one study was identified that compared the association between home smoking bans and smoking behavior across racial/ethnic groups and among SES groups. This study, which analyzed data on employed women from the Tobacco Use Supplement to the Current Population Survey[107] found that across all racial/ethnic and SES groups, respondents with a home smoking ban were less likely to be current smokers, compared with those without a home smoking ban.

Several studies have focused on social control and adult smoking among specific populations. Most of these studies focused on associations between home smoking bans and smoking status, intentions to quit, or cessation. A study of African American and Puerto Rican young adults[109] found that respondents in homes where smoking was banned were less likely to be smokers than those in homes where smoking was allowed; the study did not control for whether there was a smoker in the household. A study of LGBT adult smokers in Colorado[110] found that those who had smoking restrictions in the home were

more likely to be preparing to quit in the next month (OR 2.42; 95% CI 1.54–3.80). Similarly, among a sample of Chinese American smokers in New York, those with complete smoking bans reported smoking fewer cigarettes per day and were 3.4 times more likely to report a quit attempt in the past year than those with no home smoking ban (95% CI 1.51–7.05).[111] A study of male Vietnamese smokers in California[112] reported a similar finding, but the association between home smoking bans and quit intentions was confounded by family conflict about smoking. A study of American Indian adults who had filled a prescription for nicotine replacement therapy[113] found that those with home smoking bans were more likely to report 7-day abstinence 8 months later compared to those without home smoking bans.

## Social Support and Smoking

### Adolescents

No studies were identified that focused on disparities in the effects of social support on adolescent smoking initiation or progression. The few studies that approach similar topics have focused on specific aspects of parenting that are difficult to disentangle from other parenting practices, such as social control and monitoring. For example, Nowlin and colleagues[99] found that high-quality parent–child relationships were protective against smoking among white and African American adolescents, but the association was significantly stronger among whites. Only the association between high-quality mother–child relationships and smoking among whites remained significant in a 1-year follow-up. A growth curve study of family interactions and substance use among white and African American adolescents[114] found that negative family interactions were associated with increases in smoking during adolescence among African American males and white females but not among African American females and white males. Studies have not assessed disparities in the influence of social support on smoking initiation and progression among adolescents of other racial/ethnic groups, across SES groups, or across sexual orientation groups. As explained above, the lack of research in this area could be attributable to the assumptions that social influence is a stronger determinant of smoking initiation and that social support is a stronger determinant of smoking cessation, which usually occurs among adults.

### Adults

Most studies of social relationships and smoking cessation have focused on social support, including emotional, informational, and instrumental support. The evidence indicates that people who have social support are more successful in quitting and achieving long-term abstinence than those who lack social support[115] and for this reason many smoking cessation programs include components to provide social support or to enhance the individual's existing support networks.[64] Reviews[64,116] have concluded that interventions to make smokers' existing social networks more supportive had not yet demonstrated efficacy, but interventions that deliver additional social support via repeated counseling sessions can be effective. Although numerous studies have focused on racial/ethnic differences in the effectiveness of pharmacological smoking cessation treatments,[117–121] very few have examined disparities in the effects of social support interventions on smoking cessation outcomes.[122]

In reviewing this literature, it is important to distinguish between studies that provide additional social support as a smoking cessation treatment (e.g., support groups, group counseling, ongoing contact with a professional or paraprofessional counselor) from studies that examine whether smokers who already have supportive social networks are more likely to quit than are those who lack social support. Additionally, the 2008 U.S. Public Health Service Clinical Practice Guideline, *Treating Tobacco Use*

*and Dependence*,[117] distinguished between practical counseling, defined as providing problem-solving skills/skills training, and providing general support and encouragement to quit. For reviewed studies that provide both practical counseling and social support it can be difficult to distinguish between the effects of the two. The Guideline also distinguished between "intra-treatment social support" (providing support during contact with a clinician) and "extra-treatment social support" (intervening to increase social support in the smokers' environment). The Guideline panel recommended the former but not the latter, citing literature indicating the difficulty of helping smokers identify and use support outside of the treatment setting.[117]

### *Smoking Cessation Interventions That Include Social Support Components*

In a review of smoking cessation interventions among racial/ethnic minority groups, Cox and colleagues[118] located a total of 64 studies. These focused on African Americans (n = 28), Hispanics (n = 10), American Indians (n = 4), Asian Americans (n = 3), and multiple racial/ethnic minority groups (n = 19). Studies that used social support interventions from the Cox and colleagues review, along with additional studies published between 2011 and 2012, are discussed here and summarized in Table 6.1. Specific criteria for study inclusion were: extensive use of social support (i.e., more than one session) but no use of pharmacotherapy, media campaigns, or community-wide programs. Various study designs and interventions were used. Most studies involved counseling and support provided by health professionals or trained laypeople, either in person or by telephone. The interventions typically included emotional support and counseling on motivation, goal setting, and/or relapse prevention. In addition to individual and group support, study interventions sometimes included other social support components such as buddy interventions, culturally tailored or nontailored self-help materials, and motivational enhancement. Some studies provided structured and directive interventions; others offered general check-in contacts and left the content of the conversation to the discretion of the counselor and client.

Most of these studies found that smoking cessation interventions that included individual and/or group support and counseling were more effective than control conditions or interventions that did not include support and counseling. Only a few studies[123–126] compared the effects of a social support intervention across demographic groups. Three studies found higher quit rates among African Americans than among whites,[123–125] and one study found equally strong intervention effects among Chinese Americans, Korean Americans, and Vietnamese Americans.[126] Although Audrain-McGovern and colleagues[123] found that African Americans had a higher quit rate than whites (8.0% vs. 2.0%), the intensive motivational interviewing intervention was less successful than structured brief advice (OR 0.41; 95% CI 0.17–0.97). Also, the higher quit rate among African Americans compared with whites reported by Cluss and colleagues[124] cannot be attributed to the social support intervention because the study lacked a control group.

## Table 6.1 Studies of Social Support Smoking Cessation Interventions Among Specific Populations

| Author (year) | Sample | Social support intervention | Outcomes |
|---|---|---|---|
| **Studies that compared social support intervention effects across demographic groups** | | | |
| Audrain-McGovern et al. 2011[123] | 355 adolescents (45% African American, 40% white, and 12% Hispanic) | Five sessions of MI or structured brief advice | African Americans were more likely to attempt to quit than whites,* and MI intervention was *less* effective than structured brief advice.* No interactions between treatment condition and ethnicity were reported. |
| Cluss et al. 2011[124] | 856 low-income pregnant women (59% white, 37% African American, and 4% other) | Four to eight sessions of MI, goal setting, and counseling | African Americans were more likely to attempt to quit than whites,* but this difference could not be attributed to the social support intervention because the study lacked a control group. |
| Windsor et al. 1993[125] | 814 pregnant adult smokers (52% African American and 48% white) | Individual and group counseling, social support, and buddy intervention (control condition was no intervention) | Abstinence at 32 weeks was higher among the treatment group than among the control group.* A significant treatment effect was found among African Americans* but not among whites. |
| Zhu et al. 2012[126] | 2,277 Asian American adults (including those of Chinese, Korean, and Vietnamese origin) in California | As many as six quitline counseling sessions (control condition was self-help materials) | Abstinence at 6 months was higher for those who received quitline counseling than those who received self-help materials only.* The intervention effect was significant among Chinese Americans,* Korean Americans,* and Vietnamese Americans.* |
| **Studies that involved different populations but did not compare intervention effects across demographic groups** | | | |
| Hennrikus et al. 2005[162] | 2,095 hospital inpatients (78% white and 16% African American) | Physician advice plus three to six phone calls incorporating MI, action planning, and relapse prevention (control conditions were physician advice only or modified usual care) | No significant intervention effects or racial/ethnic differences were reported. |
| Jason et al. 1988[163] | 165 adults (96% African American) | Weekly support meetings and supportive phone calls (control condition was no intervention) | Four-month abstinence was higher among the treatment group than among the control group. |
| Malchodi et al. 2003[164] | 142 pregnant women (63% Hispanic and 12% African American) | As many as eight contacts with trained peer counselors (control was usual prenatal clinic care) | The intervention group smoked fewer cigarettes per day,* but there were no group differences in cessation, and no racial/ethnic differences were reported. |
| Nevid & Javier 1997[165] | 93 Hispanic adults | Eight group sessions and telephone support (control condition was one session and self-help materials) | No significant intervention effect was found. |
| Voorhees et al. 1996[166] | 292 African American adults recruited at churches | Churches randomly assigned to intensive program with individual counseling and group sessions or to a minimal self-help condition | No difference in 12-month abstinence was found between the groups. |
| Wetter et al. 2007[167] | 297 Spanish-speaking Hispanic adults | One helpline phone counseling session plus three proactive phone calls (control was one helpline counseling session only) | The intervention condition produced significantly higher 12-week abstinence.* |
| Woodruff et al. 2002[168] | 313 Hispanic adults | Four home visits and three phone calls from trained lay health advisors known as *promotores* (control was referral to helpline) | A significant intervention effect on 7-day abstinence was found.* |

*Notes:* Studies were included in this table if they included multiple counseling or support sessions but did not include pharmacotherapy, community-wide programs, or media campaigns. MI = motivational interviewing.
*Significant finding.

### Studies of Naturally Occurring Social Support and Tobacco Use Behaviors

Studies have examined individuals' preexisting level of social support as a predictor of smoking cessation success. Several of these studies focused on diverse populations, including Hispanics,[127,128] African Americans,[128–135] Filipino immigrants,[136] and Korean Americans.[137,138] All the studies found that people were more successful in quitting smoking if they had support for their quit attempts from spouses, other family members, or friends.

Some studies have examined the association between social support and current smoking. A study of low-income African American women in Detroit[139] found an inverse relationship between social support (defined as having someone they could count on to help run errands, lend money, watch their children, lend a car or give a ride, and provide encouragement if needed) and current smoking. Overall, the evidence suggests that naturally occurring social support is associated with more successful smoking cessation across demographic groups.

## Discrimination and Smoking

### Disparities in the Prevalence of Discrimination

Among adults, African Americans are most likely to report discrimination, followed by Hispanics, Asians, and whites.[38,140,141] Among young adults, LGBT groups report more discrimination than heterosexuals.[37] The prevalence of reported discrimination among adolescents has not been well studied.

### Discrimination and Smoking Initiation and Progression Among Adolescents

Several studies have documented associations between discrimination and smoking initiation or progression within specific racial/ethnic minority groups of adolescents, but little research exists examining this association across groups (Table 6.2). A study that compared this association across racial/ethnic groups[78] found that perceived discrimination was associated with light smoking among older Puerto Rican and African American adolescents, with no racial/ethnic differences in the strength of the association. A study of Hispanic adolescents[47] found that discrimination was associated with the increased odds of lifetime and past-month smoking (OR 1.73; 95% CI 1.30–2.31 and OR 2.54; 95% CI 1.73–3.72), and a study of African American adolescent girls[46] found that discrimination was correlated with the odds of lifetime smoking ($r = 0.35$; $p \leq 0.001$) but did not assess progression to higher levels of smoking. A study of Hispanic adolescents in Southern California[142] found that discrimination predicted smoking initiation among girls but not among boys. A study of Oregon adolescents[143] found that the disparity in smoking across sexual orientation groups was smaller in communities that had more supportive social environments for lesbian, gay, and bisexual youth (e.g., higher proportion of same-sex couples, presence of gay–straight alliances in schools, nondiscrimination and antibullying school policies). A study of American Indian adolescents living on or near one of three reservations in the upper Midwest found high levels of reported discrimination among the youth; the study also found that adolescents who had experienced discrimination tended to respond with anger and delinquent behaviors, which in turn were associated with substance use, including tobacco.[48]

Most studies have found that the risk of smoking increases as the level of discrimination increases. However, a study of low-income African American and Hispanic adolescents found that discrimination was a risk factor for smoking among boys (OR 1.9; 95% CI 1.2–3.0) but was protective among girls (OR 0.6; 95% CI 0.3–1.1).[144] This study analyzed data from the Moving to Opportunity Study in which low-income public housing residents were randomly assigned to remain in public housing, move to any

neighborhood outside of public housing, or move to a low-poverty neighborhood. Among adolescents, the positive association between discrimination and smoking was strongest among the boys who remained in public housing, suggesting a socioeconomic disparity in the effects of discrimination on smoking. The inverse association between discrimination and smoking among girls did not vary across experimental conditions. In post hoc analyses, the inverse association between discrimination and smoking among girls appeared to be driven by girls who had become pregnant and had dropped out of school. Among girls who remained in school and/or did not become pregnant, there was no association between discrimination and smoking. These findings illustrate the complexity of the association between discrimination and smoking and underscore the importance of examining confounding and moderating variables.[145]

Overall, the evidence suggests that discrimination can increase the risk of smoking, but it is not clear whether specific populations of adolescents are particularly vulnerable or resilient to the effects of discrimination. More research is needed to understand variation in the association between discrimination and adolescent smoking by race/ethnicity, sexual orientation, SES and other factors.

### Table 6.2 Studies of Discrimination and Smoking

| Author (year) | Discrimination measure | Sample | Findings |
|---|---|---|---|
| **Studies of adolescents** | | | |
| Fagan et al. 2009[78] | "How much have you experienced discrimination by the police or security guards?" | 550 older adolescents (mean age = 19 years); 52% African American and 48% Hispanic | Discrimination in late adolescence was significantly associated with light smoking (relative to nonsmoking) in late adolescence,* which in turn was significantly associated with smoking in early adulthood.* No significant differences were found between African Americans and Hispanics in the strength of the association between discrimination and smoking. |
| Guthrie et al. 2002[46] | Williams Everyday Discrimination Scale | 105 African American adolescent girls (mean age = 15 years) | Discrimination was correlated with cigarette smoking.* |
| Lorenzo-Blanco et al. 2011[142] | Williams Everyday Discrimination Scale | 1,124 Hispanic 9th-grade students in Southern California | Perceived discrimination was associated with past-month smoking among girls* but not among boys. |
| Okamoto et al. 2009[47] | Williams Everyday Discrimination Scale | 1,332 Hispanic 9th-grade students in Southern California | Perceived discrimination was associated with lifetime smoking* and past-month smoking.* |
| Whitbeck et al. 2001[48] | Williams Everyday Discrimination Scale | 195 American Indian 5th- to 8th-grade students living on or near reservations | Discrimination was associated with a composite measure of substance use (multiple substances, including cigarette smoking).* |
| Wiehe et al. 2010[144] | "Can you think of 1 or more occasions in the past 6 months when you felt you were treated unfairly because of your race or ethnicity in the following places?" | 2,561 African American and Hispanic adolescents ages 12 to 19 years who participated in the Moving to Opportunity Study | Discrimination was associated with increased odds of smoking among boys* and decreased odds among girls.* No racial/ethnic differences in the association between discrimination and smoking were reported. |

## Table 6.2 continued

| Author (year) | Discrimination measure | Sample | Findings |
|---|---|---|---|
| **Studies of adults** | | | |
| Albert et al. 2008[145] | "Ever discriminated against due to race/ethnicity?" | 1,475 adults in Dallas (54% African American, 33% white, and 13% Hispanic) | Hispanics who reported discrimination had a higher prevalence of smoking compared to those who did not, but no statistical significance was reported. There was no association between discrimination and smoking among African Americans or whites. |
| Bennett et al. 2010[151] | Williams Everyday Discrimination Scale "For unfair reasons, do you think that you have ever not been hired for a job?" "Have you ever been unfairly stopped, searched, questioned, physically threatened or abused by the police?" | 4,454 low-income, inner-city pregnant women at public health centers in Philadelphia (67% African American, 21% Hispanic, 9% white, and 3% other) | A high level of everyday discrimination was significantly associated with smoking.* No significant differences were found across racial/ethnic groups regarding the strength of the association. |
| Blosnich & Horn 2011[37] | "Within the last 12 months, have any of the following affected your academic performance?" | College students ages 18–24 years (4,286 heterosexual, 1,825 gay/lesbian, 2,545 bisexual, and 1,545 unsure) | Discrimination was more prevalent among gay/lesbian, bisexual, and unsure students than among heterosexuals,* but discrimination was not associated with smoking. Among gay/lesbian, bisexual, and unsure students, being in a physical fight was associated with an increased risk of smoking.* |
| Borrell et al. 2010[38] | Williams Everyday Discrimination Scale | 6,680 adults participating in the Multi-Ethnic Study of Atherosclerosis in California, Illinois, Maryland, Minnesota, New York, and North Carolina during 2000 and 2002 (39% white, 28% African American, 22% Hispanic, and 12% Chinese American) | Discrimination was associated with increased odds of being a current smoker among African Americans and whites* but not among Hispanics or Chinese Americans. |
| Borrell et al. 2007[146] | Williams Everyday Discrimination Scale | 3,320 adult participants in the CARDIA study (45% African American and 45% white) | African Americans experiencing racial discrimination in at least three domains in both years of this study had higher odds of reporting current* and former smoking* than did those experiencing no discrimination. The association between discrimination and smoking was not significant among whites. |
| Burgess et al. 2007[39] | Krieger Experiences of Discrimination (EOD) measure | Adults in Minnesota (472 LGBT individuals and 7,412 heterosexuals) | Discrimination* and smoking* were each more prevalent among LGBT individuals than among heterosexuals, but discrimination was not associated with smoking. |
| Chae et al. 2008[40] | Williams Everyday Discrimination Scale | 1,977 Asian Americans in the National Latino and Asian American Study (2002–2003) | Odds of current smoking were higher among Asian Americans who reported high levels of racial/ethnic discrimination compared to those who reported no discrimination. This finding was not significant. |

## Table 6.2 continued

| Author (year) | Discrimination measure | Sample | Findings |
|---|---|---|---|
| Corral & Landrine 2012[152] | "How much racism or discrimination have you personally experienced in the past year?" | 2,118 African American adults in California participating in a door-to-door survey in random census tracts | High discrimination was associated with higher odds of current smoking.* |
| Gibbons et al. 2004[41] | Schedule of Racist Events | 897 African American parent-adolescent dyads | Among parents and adolescents, discrimination was associated with higher scores on a combined substance use index (tobacco, alcohol, and other drugs combined).* |
| Horton & Loukas 2013[147] | Schedule of Racist Events | 984 technical/vocational school students in Texas (41.8% white, 27.8% African American, and 30.4% Mexican American) | Discrimination increased the likelihood of current use of cigarettes* and cigars/cigarillos* among African American students, and current cigar use among white students.* There were no associations between discrimination and tobacco use among Mexican Americans. |
| Krieger et al. 2005[140] | Krieger Experiences of Discrimination (EOD) measure | 616 working-class adults in Boston (26% African American, 40% Hispanic, and 34% white) | The association between discrimination and current smoking approached statistical significance among African Americans and Hispanics but not among whites. |
| Landrine et al. 2006[43] | Schedule of Racist Events | 1,569 college students and community adults (49.7% white, 25.9% Hispanic, 11.1% African American, and 6.0% Asian American) | Among whites and racial/ethnic minority groups, those who experienced moderately frequent* or frequent* discrimination were more likely to be current smokers than those who experienced low discrimination. All racial/ethnic minority groups were combined into a single group. |
| Landrine & Klonoff 2000[42] | Schedule of Racist Events | 453 African American adults | Smoking prevalence was higher among participants who reported frequent discrimination than among those who reported infrequent discrimination.* |
| Li & Delva 2012[148] | Krieger Experiences of Discrimination (EOD) measure | 998 Asian American men who participated in the 2002-2003 National Latino and Asian American Study (28% Chinese American, 24% Filipino American, 24% Vietnamese American, and 24% Other [Asian groups]) | Discrimination was associated with current smoking among the whole sample, but the association was significant only among the other Asian groups in stratified analyses.* |
| Maxson et al. 2012[150] | Krieger Experiences of Discrimination (EOD) measure | 1,518 pregnant women (78% African American and 22% white) | Discrimination was associated with current smoking versus never-smoking among African Americans* but not among whites. |
| Nguyen 2012[149] | Krieger Experiences of Discrimination (EOD) measure | 677 pregnant women (39% African American and 61% Hispanic) | Discrimination was associated with smoking among African Americans* but not among Hispanics. |
| Purnell et al. 2012[141] | Perceived racial discriminations assessed in 2 domains (health care, work) as measured by the Reactions to Race module | 85,130 adult respondents in the 2004–2008 Behavioral Risk Factor Surveillance Surveys (81% white, 11% African American, and 4% Hispanic) | Current smoking was more prevalent among respondents who reported being treated worse than people of other races in health care settings* or in the workplace,* relative to those who reported equal treatment. Racial/ethnic differences in the association between discrimination and smoking were not assessed. |

### Table 6.2 continued

| Author (year) | Discrimination measure | Sample | Findings |
|---|---|---|---|
| Todorova et al. 2010[153] | "Have you ever experienced discrimination as a result of your race, ethnicity or language?" "Have you ever experienced discrimination as a result of your race, ethnicity or language [in a 'healthcare setting']?" | 1,122 Puerto Rican adults in Boston | Former smokers were more likely to report discrimination than never-smokers or current smokers.* |
| Tran et al. 2010[44] | Krieger Experiences of Discrimination (EOD) measure | 1,384 immigrant adults in the Midwest (40% African-born black, 31% Southeast Asian, and 29% Latino/Hispanic) | Perceived discrimination was significantly related to being a current smoker for Southeast Asian immigrants* but not among those in the other racial/ethnic groups. |
| Yoo et al. 2010[45] | Asian American Racism-Related Stress Inventory and the Perceived Ethnic Discrimination Questionnaire—Community Version | 271 Asian American adults participating in the 2008 Asian Pacific Arizona Initiative Survey | Asian Americans treated like they were not American because of their race were at increased risk of tobacco use.* |

*Notes*: Hatzenbuehler et al. 2011,[143] not included in this table, used a measure of social environment to conclude that a more supportive social environment for lesbian, gay, and bisexual youth was significantly associated with reduced tobacco use (OR 0.92; 95% CI 0.90–0.94). LGBT = lesbian, gay, bisexual, and transgender.
*Significant finding.

## Discrimination and Current Smoking Among Adults

Many studies have examined the strength of the association between discrimination and smoking among adults across racial/ethnic groups (Table 6.2). Most of the studies that included multiple racial/ethnic groups compared African Americans, Hispanics, and whites. Most of these studies found significant associations between discrimination and smoking among one or more racial/ethnic groups, but the specific associations differed between studies.

A study of adults ages 45–84 years in six U.S. states[38] found that African Americans and whites who reported racial/ethnic discrimination were more likely to be current smokers, compared to those who did not report discrimination (OR 1.34; 95% CI 1.00–1.81 and OR 1.88; 95% CI 1.02–3.44, respectively); this association was not significant among Hispanic or Chinese American participants. Conversely, a study of adults in Texas[145] found that Hispanics who experienced discrimination had a higher prevalence of current smoking, but not African Americans or whites. In a longitudinal study of young adults,[146] African Americans who reported high levels of discrimination were at increased risk of being current or former smokers (OR 1.87; 95% CI 1.18–2.96), compared with those who did not report discrimination.

A study of adults in Boston[140] did not find significant associations between discrimination and smoking among whites, African Americans, or Hispanics, although the association approached statistical significance among the latter two groups. A study of technical/vocational students (mean age = 25) found that discrimination was significantly associated with increased cigarette and cigar smoking among African Americans ($r = 0.17$ and $r = 0.29$, respectively), associated only with cigar smoking among whites ($r = 0.13$), and not significantly associated with smoking among Mexican Americans.[147]

In an ethnically diverse sample of college students and community adults, experiencing moderately frequent or frequent discrimination was associated with an increased risk of being a current smoker among whites (OR 1.56; 95% CI 1.09–2.24 and OR 1.76; 95% CI 1.09–2.82) and members of racial/ethnic minority groups (OR 1.99; 95% CI 1.14–3.48 and OR 2.32; 95% CI 1.38–3.91).[43] However, the odds ratios were similar for whites and racial/ethnic minority groups, and the minority groups were not subdivided into specific racial/ethnic groups (the racial/ethnic minority group was 25.9% Hispanic, 11.1% African American, and 6.0% Asian). An analysis of data from the 2004–2008 Behavioral Risk Factor Surveillance Surveys found that across racial/ethnic groups, adults who reported that they had been treated worse than others in health care or workplace settings because of their race/ethnicity had an elevated risk of being current smokers (OR 1.18; 95% CI 1.09–1.26 and OR 1.13; 95% CI 1.03–1.23).[141] However, this study included race/ethnicity as a covariate rather than a moderator, so it does not indicate whether the association between discrimination and smoking was stronger among one group than another.

A study of Asian American men in the 2002–2003 National Latino and Asian American Study compared current smokers with current nonsmokers and found that current smokers had significantly higher scores on an everyday discrimination measure (OR 1.41; 95% CI 1.06–1.89).[148] Stratifying the sample by Asian groups revealed that the association between discrimination and smoking was not significant among Vietnamese American, Filipino American, or Chinese American men, but was significant among the "Other" group (OR 2.67; 95% CI 1.52–4.71).

Although most studies of discrimination and smoking have included U.S.-born respondents and immigrants, one study[44] focused only on immigrants. This study found that discrimination was associated with increased odds of being a current smoker among Southeast Asian immigrants (OR 1.60; 95% CI 1.02–2.51) but not among Hispanic and African immigrants.

Three studies of discrimination and smoking among multiple racial/ethnic groups focused on pregnant women. Nguyen and colleagues[149] found that discrimination was a risk factor for smoking among pregnant black women (OR 3.36; 95% CI 1.23–9.19) but not among pregnant Hispanic women. Maxson and colleagues[150] found that discrimination was associated with increased smoking among pregnant African American women (OR 1.15; 95% CI 1.01–1.31) but not among pregnant white women. A study of low-income pregnant women (67% African American and 21% Hispanic) found that a high level of everyday discrimination was associated with an increase in smoking during pregnancy (OR 1.41; 95% CI 1.15–1.74); race/ethnicity did not moderate this association.[151]

Additional studies have focused on the association between discrimination and smoking among single racial/ethnic groups; the majority have focused on African Americans. Several studies[41,42,152] found that African American adults who reported high levels of discrimination were more likely to smoke than African Americans who did not report high levels of discrimination. Similar associations between discrimination and current smoking have been reported among other racial/ethnic groups, including Asian Americans.[40,45,148] A study of Puerto Rican adults living in Boston[153] found that perceived discrimination was associated with a higher probability of having ever smoked. However, there were no significant differences in discrimination between current smokers and current nonsmokers.

Although LGBT individuals experience more discrimination and have a higher prevalence of smoking than heterosexuals, few studies have compared the association between discrimination and smoking across sexual orientation. The two studies that assessed the association between discrimination and

smoking among LGBT groups[37,39] did not find that discrimination was a risk factor for smoking. No studies were identified that assessed SES-based discrimination and smoking.

## Evidence Summary

Table 6.3 summarizes the evidence discussed in this chapter on disparities in associations between aspects of social relationships, the continuum of smoking behavior, and TRHD.

### Table 6.3 Summary: Social Relationships, Smoking Behavior, and TRHD

| Characteristics of social relationships | Early experimentation and progression to regular smoking | Cessation attempts and smoking cessation |
|---|---|---|
| Social networks | *The evidence strongly supports that:*<br>▪ Social connections with smokers in a social network influence smoking initiation and progression.<br>▪ Social network isolation (few or no social ties) is associated with smoking initiation and progression.<br>▪ Popularity in school-based social networks is associated with smoking initiation and progression, although this can vary according to the social context of the school.<br>▪ The effect of popularity on smoking generalizes to some vulnerable populations, such as Hispanics.<br>*The evidence is insufficient to determine* the effect of popularity on smoking for most other vulnerable populations and for Hispanics in social contexts that are not primarily Hispanic.<br>*The evidence is insufficient to determine* differences across groups concerning the effects of social networks on smoking. | *There is limited evidence suggesting that* smoking cessation diffuses through social networks.<br>*The evidence is insufficient to determine* if differences exist by demographic group. |
| Social influence | *The evidence strongly supports that* social influence is associated with smoking initiation and progression among most racial/ethnic groups.<br>*The evidence strongly supports that* living with a smoker is associated with smoking initiation and progression.<br>*There is limited evidence suggesting that* the effect of social influence on smoking initiation and progression is stronger among white adolescents than among adolescents of other racial/ethnic groups.<br>*The evidence is insufficient to determine* whether there are differences in the amount of social influence across SES or sexual orientation groups.<br>*The evidence is insufficient to determine* whether the effect of social influence on smoking initiation and progression varies across SES or sexual orientation groups.<br>*The evidence is insufficient to determine* whether the effect of living with a smoker varies across demographic groups. | *The evidence is insufficient to determine whether:*<br>▪ There is a causal relationship between social influence and smoking cessation.<br>▪ There are differences across demographic groups in the effects of social influence on smoking cessation. |

## Table 6.3 continued

| Characteristics of social relationships | Early experimentation and progression to regular smoking | Cessation attempts and smoking cessation |
|---|---|---|
| Social control | *The evidence strongly supports that:*<br>▪ Home smoking bans are protective against adolescent smoking initiation and progression.<br>▪ Low-income families are less likely to have home smoking bans than higher income families.<br>*The evidence is insufficient to determine whether*:<br>▪ The effects of home smoking bans vary across demographic groups.<br>▪ Other parenting practices to prevent youth smoking are differentially effective across demographic groups. | *The evidence strongly supports that* low-income families are less likely to have home smoking bans.<br>*There is limited evidence suggesting that* the association between home smoking bans and cessation-related behaviors exists in multiple racial/ethnic groups and among LGBT groups.<br>*The evidence is insufficient to determine* whether the strength of the association between home smoking bans and cessation differs across demographic groups.<br>*The evidence is insufficient to determine* whether home smoking bans are causally associated with lower smoking prevalence, higher intentions to quit, and more successful quit attempts among adults. |
| Social support | *There is limited evidence suggesting that* social support from parents is protective against adolescent smoking initiation and progression.<br>*The evidence is insufficient to determine* whether the effects of social support vary across demographic groups. | *The evidence strongly supports that:*<br>▪ Smokers with higher levels of naturally occurring social support have better smoking cessation success.<br>▪ The association between naturally occurring social support and smoking cessation success exists in multiple racial/ethnic groups.<br>▪ Social support interventions (in the absence of pharmacotherapy) are more effective than control conditions in producing abstinence among smokers trying to quit.<br>▪ Social support interventions (in the absence of pharmacotherapy) are effective in producing abstinence in multiple racial/ethnic groups.<br>*There is limited evidence suggesting that* social support interventions are more effective among African Americans than among other groups.<br>*The evidence is insufficient to determine* whether the strength of the association between naturally occurring social support and smoking cessation success varies across demographic groups. |
| Discrimination | *There is limited evidence suggesting that* discrimination is associated with smoking initiation and progression among adolescents.<br>*The evidence is insufficient to determine* which demographic groups of adolescents report the most discrimination.<br>*The evidence is insufficient to determine* whether the strength of the association between discrimination and smoking initiation or progression varies across demographic groups. | *The evidence strongly supports that* discrimination is associated with current smoking among African Americans, Hispanics, and some Asian groups.<br>*There is limited evidence suggesting that* the association between discrimination and current smoking is stronger among racial/ethnic minority groups than among whites.<br>*The evidence is insufficient to determine* whether the association between discrimination and smoking varies across SES groups. |

*Notes:* SES = socioeconomic states. LGBT = lesbian, gay, bisexual, and transgender.

## Chapter Summary

Social relationships exert powerful influences on numerous human behaviors, including tobacco use behaviors. Both structural aspects of social relationships (social networks) and functional aspects (social influence and social comparison, social control, social support, and discrimination) have been studied in relationship to TRHD. This chapter has reviewed the evidence that social relationships contribute to TRHD across the tobacco use continuum, for both youth and adults, and across groups based on race/ethnicity, SES, and sexual orientation. It is likely that different aspects of social relationships influence different stages of the tobacco use continuum; as a result, some relationships have been studied in greater depth than others. The depth of the literature also differs across race/ethnicity, SES, and sexual orientation, and is especially limited for the latter two demographic categories. A summary of the findings from the literature reviewed in this chapter is provided in Table 6.3.

Indicators of sociometric position (i.e., a person's pattern of connections to others in the social network), such as popularity and social isolation, are risk factors for smoking initiation among adolescents; this finding likely generalizes to disparate populations. However, the direction and mechanism of this association remain unclear, and there is little evidence about whether there are racial/ethnic, gender, or sexual orientation differences in this association. Additional research is needed to determine why two opposite social network statuses—popularity and social isolation—are both risk factors for adolescent smoking. It would also be informative to explore whether the overall composition of the school moderates the association between social network variables and smoking. The influence of sociometric position on smoking cessation among adults and how this may differ based on race/ethnicity, SES, and sexual orientation is an area for future research.

Studies show that social influences (peers, parents, and other family members) are associated with smoking initiation and progression among adolescents across most demographic groups that have been studied. Parents (including those who are smokers themselves) may exert social control over youth smoking through a variety of means, including talking with their children about smoking, prohibiting their children from smoking, restricting youth's access to tobacco products, and by completely banning smoking in the home (implementing home smoking bans that apply to all). Few studies have examined differences in the effectiveness of these social control mechanisms by groups. The evidence shows that home smoking bans are associated with decreased adolescent smoking initiation and progression and that smokers with home smoking bans are more likely to have cessation intentions and make quit attempts. However, low-income families—who are more likely to include people who smoke—are less likely to have home smoking bans than families of higher SES. There is no evidence that the association between home smoking bans and reduced smoking behaviors differs across demographic groups.

Social support is associated with increased quitting success among smokers across racial/ethnic groups. Smokers who have more established social support systems and those who are provided social support during treatment have an increased likelihood of successfully quitting. No evidence is available about the relative effectiveness of social support interventions across SES groups or sexual orientation groups. In addition, there is insufficient research to determine whether culturally tailored social support interventions are superior to culturally generic interventions. Research is needed to compare the effectiveness of different types of social support interventions in different populations, alone and in combination with pharmacotherapy. Understanding which types of social support interventions are most effective for various populations may contribute to increasing cessation success.

Studies find that discrimination is associated with smoking initiation and progression among racial/ethnic minority adolescents and current smoking among racial/ethnic minority adults. However, findings about which minority groups experience the strongest effects of discrimination on smoking vary considerably. It is likely that some of these studies had insufficient statistical power to detect associations between discrimination and smoking among some groups studied, so a failure to detect significant effects should not be taken as evidence that no effects exist. The larger studies generally found significant associations between discrimination and current smoking among adults of most racial/ethnic minority groups. Although LGBT groups have high levels of smoking and experience high levels of discrimination, an association between discrimination and smoking among LGBT groups has not been found. However, only a few studies have examined this relationship.

Overall, relatively few studies of social relationships distinguish among groups by race/ethnicity, SES, and/or sexual orientation. At times, studies find that social relationships were associated with reductions in TRHD. For example, the presence of friends who smoke may be a stronger risk factor for smoking among white adolescents than among racial/ethnic minority adolescents, and the effects of social support interventions for smoking cessation appear to be stronger among African Americans than among whites. These patterns would be expected to reduce, not exacerbate, TRHD.

## Research Needs

Research is needed to fill gaps in the literature relating to understudied areas of the intersection between social relationships, tobacco use, and TRHD, and where appropriate, should consider both cigarettes and other types of tobacco products. Although TRHD have been recognized for decades,[154] most studies on social relationships and tobacco use do not focus on disparities. Many studies focus on homogenous populations and do not address whether social relationships have different effects for different groups. To date, most research on disparities in social relationships and smoking has focused on racial/ethnic disparities, and on the largest population groups: whites, African Americans, and Hispanics. Research should also be directed toward examining social influences on smoking among ethnic groups who represent smaller segments of the population, especially those who have high smoking prevalence, including American Indians/Alaska Natives and Native Hawaiians/Pacific Islanders.

Although LGBT populations are at increased risk of smoking, very few studies have addressed the potential impact of social influences on TRHD by sexual orientation. A better understanding of social relationships and smoking among LGBT groups might be especially informative considering the recent attention paid to adolescent bullying based on sexual orientation. More research is also needed about the nature of social support and social control among same-sex couples and how the dynamics of these social interactions can influence tobacco use. Many large national surveys now assess sexual orientation (e.g., the National Adult Tobacco Survey as of 2009,[55] NYTS as of 2014,[52] Youth Risk Behavior Surveillance Survey as of 2015[155]) which can inform this research.

Most of the studies reviewed in this chapter focused on membership in only one type of minority group—racial/ethnic, SES, or sexual orientation. Individuals who are members of more than one minority group could be at especially high risk for TRHD. Very few studies focused on intersections across multiple minority statuses, such as LGBT and racial/ethnic minority groups.[156–159] Research is needed to help understand how social relationships create or exacerbate TRHD across the various intersections of minority groups.

Most existing research studies include race/ethnicity and SES as confounders in larger, multivariate prediction models of smoking, making it difficult to discern possible disparities in the strength of the effects of social relationships on smoking. When studies have sufficient statistical power, researchers should conduct analyses of the interactions (moderator effects) of social influences and race/ethnicity, gender, and sexual orientation to determine whether specific predictors of smoking are stronger in specific groups.

Studies of social influence on adolescent smoking initiation and progression have generally focused on peers who are close in geographic proximity (e.g., friends in classrooms and schools). Given the large and growing importance of online social networks, the extent to which these influences differ across racial/ethnic, gender, or sexual orientation groups is increasingly important to consider.[160] Similarly, studies may now use online and mobile technologies to deliver cessation interventions. Research studies should evaluate whether these technologies are equally effective at promoting cessation across different racial/ethnic groups, SES groups, genders, and sexual orientations.

Finally, this chapter summarizes evidence regarding associations of social influences with TRHD. However, it is also likely that tobacco use behaviors influence the types of social relationships that individuals form. Similarities in smoking behavior between adolescents and their friends are likely due to a combination of peer influence effects (adolescents emulating their friends' smoking behavior) and peer selection effects (adolescents befriending others who have similar smoking behaviors).[11,161] To the degree that smokers are more likely to affiliate with smokers and nonsmokers to affiliate with nonsmokers, these selection effects could contribute to and perpetuate disparities across groups. In addition, as smoking becomes a more stigmatized behavior, individuals may experience discrimination due both to their membership in a minority demographic group and to their smoking behavior. These questions warrant further research attention.

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