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Influence of Tobacco Marketing on Smoking Behavior

The relationship between tobacco marketing and smoking behavior, particularly among adolescents, has been extensively researched. This chapter examines the evidence base for how these marketing efforts affect initial uptake and continued use of tobacco by adolescents and by the general population. Data from a multitude of studies using a range of methodologies were examined along with tobacco industry source documents in assessing the role of marketing in tobacco use. Specific areas discussed include

- *The relationship between cigarette marketing and identifiable adolescent needs, such as peer acceptance, rebelliousness, risk taking, and stress relief*
- *The impact of cigarette marketing on adolescents' self-images and their perceptions of smokers*
- *The effects of exposure to cigarette marketing on adolescent smoking*
- *The relationship between tobacco marketing expenditures and tobacco consumption in the general population, including time-series and cross-sectional studies, as well as studies of the impact of advertising bans on consumption and use*

Numerous studies find a strong connection among advertising exposure, adolescent initiation to tobacco use, and progression to regular tobacco use. Cross-sectional econometric studies also show a correlation between tobacco advertising and increased cigarette consumption. As a whole, the evidence base indicates a causal relationship between tobacco advertising and increased levels of tobacco initiation and continued consumption.

Introduction

Although the tobacco industry has asserted that its marketing efforts are not aimed at creating new demand but rather at increasing brand market share, internal industry documents contribute to the evidence refuting this claim. The ability of tobacco marketing to create new demand by encouraging smoking initiation among youth and adults is a critically important aspect of the role of the media in tobacco use. Researchers have studied whether the level of tobacco advertising is related to aggregate cigarette demand: When exposed to high levels of tobacco industry marketing, do more people start using tobacco, do smokers smoke more, and are they less likely to quit? Alternatively, would the absence of cigarette advertising have the opposite effect?

This chapter reviews evidence of the influence of cigarette marketing on adolescent smoking initiation—many start to smoke before the legal age for purchasing cigarettes[1]—and on cigarette consumption in the general population. Other chapters in this monograph review advertising theory (chapter 2), types and extent of tobacco advertising and promotions (chapter 4), themes and targets of tobacco advertising (chapter 5), and media influences in preventing and controlling tobacco use (chapter 12). For a discussion of the effects on adolescent behavior of the depiction of smoking in movies, see chapter 10. Below is a brief overview of the topics covered in the main sections of this chapter.

Three lines of evidence regarding adolescent smoking are considered. The first includes literature describing adolescent psychological needs and how tobacco marketing suggests that smoking can help satisfy these needs. Subsections under the main heading of adolescent needs show that adolescents have such needs, cigarette marketing communicates to them that smoking will help fulfill these needs, and that adolescents who smoke or who do not rule out smoking in the future are more likely to believe that smoking can fulfill these needs. Of course, marketing for many other products also aims to convince adolescents that product use can help satisfy these needs.

The second related line of evidence focuses on development of self-image during adolescence[2] and involves many factors, such as popularity, masculinity/femininity, rebelliousness, acceptance by peers, confidence in interacting with others, and so forth. For example, a boy who feels he is masculine and rugged is a little more confident in interactions with others. If his peers see him in this way, he is more likely to gain admiration from others. If he perceives that smoking can bolster this image, he may more readily adopt this behavior. Further, there is evidence that those with personal images similar to the images they have of smokers will be more prone to smoke.

The third line of evidence measures exposures of adolescents to tobacco advertising and promotions and any association between those exposures and smoking behavior, including the likelihood of future smoking. First, methodological issues including study design, measures of smoking behavior, and measures of exposures and receptivity to cigarette advertising and promotions are described. Then, this section reviews the evidence that these measures are associated with higher levels of both intentions to smoke and actual smoking in both cross-sectional and longitudinal studies.

A final section of this chapter addresses various types of time-series studies that relate the level of tobacco marketing expenditures to population-based cigarette consumption. It also discusses studies

that correlate novel advertising and promotional campaigns with changes in the incidence of adolescent smoking initiation and brand preference.

For the review of research on the relationship between cigarette advertising and promotions and adolescent smoking behavior, the American Psychological Association's PsycINFO database[3] was searched for the period from index inception in 1809 to May 2007. Three search terms—marketing, tobacco, and teenagers—were combined for each search using as many forms of each word as possible, such as singular and plural, synonyms, shortened forms, and so on. After eliminating studies that clearly were not relevant (for instance, studies that mentioned the issue but addressed another topic), copies of the remaining 216 publications were reviewed, and more were eliminated as lacking actual data analysis for association between tobacco marketing and adolescent needs, self-image, smoking attitudes, or behavior. Ultimately, the list was pared down to 96 studies. This list then was checked against several published and unpublished bibliographies in this area, and another 23 relevant articles were included. Of the articles directly relating cigarette marketing practices to smoking behavior, 52 were cross-sectional and 16 were longitudinal. Of these, 22 studied the relationship between tobacco marketing and smoking intention or susceptibility to smoking among never smokers.

This chapter also includes a review of tobacco companies' documents related to marketing to adolescents, including research on the impact of brand advertising on images of the brand and the smoker of the brand. Many citations in this chapter were gathered as part of the U.S. Department of Justice lawsuit against the tobacco companies.[4] The reference notations identified as Bates numbers refer to identifying numbers stamped on document pages that can be used to access the documents catalogued in various tobacco company depositories.

Adolescents' Psychological Needs and the Influence of Cigarette Marketing

This section reviews important adolescent psychological needs, such as popularity; peer acceptance; gender identity; rebelliousness; sensation seeking; risk taking; having fun; and alleviating stress, anxiety, and depression. This review provides a basis for considering whether cigarette marketing suggests that smoking can help meet these needs, as some theorize, thus increasing the likelihood of their smoking. Studies that addressed more than one of these needs may be mentioned multiple times.

Psychological Needs of Adolescents

Changes during adolescence result in intertwined and powerful adolescent needs. Most adolescents want to be popular and gain peer approval.[5] Boys commonly experience strong needs to feel and be seen as masculine, tough, and independent. On the other hand, girls may become concerned about being seen as attractive, thin, and feminine.[6] Some adolescents become rebellious and may want to defy mainstream, adult-imposed norms.[6] The need for new experiences and sensations increases in adolescence, especially among boys,[7] and is closely associated with increased risk taking.[8] Many adolescents experience stress and depression for the first time.[9]

Subsections address each important adolescent need. Where available, three sources of evidence are reviewed relevant to how each of these needs influences behavior: (1) whether adolescents perceive that smoking can fulfill the respective

Attracting Young Smokers: A View from the Tobacco Industry

As a 1973 R.J. Reynolds planning memorandum stated, "If our Company is to survive and prosper, over the long term, we must get our share of the youth market."[a] Comprehensive analyses of thousands of U.S. tobacco industry documents demonstrate that tobacco companies researched youth smoking initiation patterns, developed brand images to appeal specifically to youth, and used euphemisms such as "younger adult smokers" over the past 20 years to disguise the focus of these efforts.[b,c,d,e,f] Similarly, tobacco industry documents show that advertising for Camel cigarettes was revised in the late 1980s to communicate to young consumers that the brand had been reformulated to reduce harshness and deliver a smooth smoke.[g] Some documentary evidence suggests that the tobacco industry cooperated with manufacturers of candy cigarettes, which were designed and packaged to look like popular cigarette brands, to appeal to children.[h]

Tobacco industry documents in the United Kingdom reveal similar thinking.[d,i] The Health Select Committee inquiry into the U.K. tobacco industry[j] disclosed documents from the industry's principal advertising agencies that show that the young are a key target and that discuss psychosocial drivers as the way to reach them. In many instances, the industry refers to "young adult smokers." However, being "youthful and exciting," attracting "new entrants," and "gaining a disproportionately large share of new recruits to the market" are recognized as vital to commercial success.[k] Young people's lifestyles, motivations, and aspirations are the subject of detailed and continuous market research. Everything possible is done to attract and retain their interest. Specifically, the conclusion is drawn repeatedly in these documents that young people smoke for emotional reasons and cigarettes can meet these needs by being aspirational and acting as "a badge" and a "sign of maturity, discernment and independence."[l] The job of advertising, therefore, is to help build and reinforce these qualities in the product.

[a]Teague, C. E. Research planning memorandum on some thoughts about new brands of cigarettes for the youth market. 2 Feb 1973. R.J. Reynolds. Bates No. 502987357/7368. http://legacy.library.ucsf.edu/tid/act68d00.

[b]Cummings, K. M., C. P. Morley, J. K. Horan, C. Steger, and N. R. Leavell. 2002. Marketing to America's youth: Evidence from corporate documents. *Tobacco Control* 11 Suppl. 1: I5–I17.

[c]Perry, C. L. 1999. The tobacco industry and underage youth smoking: Tobacco industry documents from the Minnesota litigation. *Archives of Pediatrics and Adolescent Medicine* 153 (9): 935–41.

[d]Hastings, G., and L. MacFadyen. 2000. A day in the life of an advertising man: Review of internal documents from the UK tobacco industry's principal advertising agencies. *British Medical Journal* 321 (7257): 366–71.

[e]Carter, S. M. 2003. Going below the line: Creating transportable brands for Australia's dark market. *Tobacco Control* 12 Suppl. 3: iii87–iii94.

[f]Pollay, R. W. 2000. Targeting youth and concerned smokers: Evidence from Canadian tobacco industry documents. *Tobacco Control* 9 (2): 136–47.

[g]Wayne, G. F., and G. N. Connolly. 2002. How cigarette design can affect youth initiation into smoking: Camel cigarettes 1983–93. *Tobacco Control* 11 Suppl. 1: I32–I39.

[h]Klein, J. D., and S. S. Clair. 2000. Do candy cigarettes encourage young people to smoke? *British Medical Journal* 321 (7257): 362–65.

[i]Anderson, S., G. Hastings, and L. MacFadyen. 2002. Strategic marketing in the UK tobacco industry. *Lancet Oncology* 3 (8): 481–86.

[j]United Kingdom. Parliament. House of Commons. 2000. *The tobacco industry and the health risks of smoking.* Health Select Committee, sess. 1999-00, 2nd report. Vol. 1. Report and proceedings, June 14, 2000. Vol. 2. Minutes of evidence and appendices, June 14, 2000. HC papers 1999-00 27-I and 1999-00 27-II. London: Stationery Office. http://www.parliament.the-stationery-office.co.uk/pa.

[k]Collett Dickenson Pearce and Partners. 1995. Hamlet market share. http://www.tobaccopapers.com/PDFs/0001-0099/0041.pdf.

[l]Collett Dickenson Pearce and Partners. 1995. Benson & Hedges 1995 creative briefs. http://www.tobaccopapers.com/PDFs/0001-0099/0052.pdf.

The Dynamics of Adolescence

Adolescence is a period of change related to puberty, increasing independence from parents, educational environment (elementary to middle school to high school), and greater importance of peers. These changes contribute to the development of important psychological needs. The onset of the physical changes of puberty, such as rapid growth, development of primary and secondary sex characteristics, and physical changes that contribute to increased strength and endurance, varies by as much as five years.[a] However, puberty typically begins between the ages of 10 and 15 years, so within a school grade, students can be at very different stages in this development. These changes affect body image,[b] particularly for girls.[c] Adolescent physical changes bring increasing interest in the opposite sex and a desire for independence, including autonomy in decision making.[d] In many families, these desires create conflict that can result in rebelliousness and defiance. This, in turn, can lead parents to give up attempts to monitor and set limits on their teenagers' activities and behavior.

At school, more is demanded of adolescents academically, with changing levels of support from teachers, the possibility of more competition among students, and increased importance of peer group relationships.[e] Such changes may contribute to lowered self-esteem and lead adolescents to become less interested in academics and more interested in social success.[d,e,f] Students, particularly those less competent academically, may become more focused on their abilities relative to their peers rather than on mastery of educational material. These adolescents will search for other ways to define themselves.

[a]Steinberg, L. D. 1999. *Adolescence.* 5th ed. New York: McGraw-Hill.

[b]Stice, E. 2003. Puberty and body image. In *Gender differences at puberty,* ed. C. Hayward, 61–76. New York: Cambridge Univ. Press.

[c]Compian, L., L. K. Gowen, and C. Hayward. 2004. Peripubertal girls' romantic and platonic involvement with boys: Associations with body image and depression symptoms. *Journal of Research on Adolescence* 14 (1): 23–47.

[d]Eccles, J. S., C. W. A. Midgley, C. M. Buchanan, D. Reuman, C. Flanagan, and D. M. Iver. 1993. Development during adolescence. The impact of stage-environment fit on young adolescents' experiences in schools and in families. *American Psychologist* 48 (2): 90–101.

[e]Eccles, J. S., A. Wigfield, C. Midgley, D. Reuman, D. MacIver, and H. Feldlaufer. 1993. Negative effects of traditional middle school on student's motivation. *Elementary School Journal* 93 (5): 553–74.

[e]Wigfield, A., and J. S. Eccles. 1994. Children's competence beliefs, achievement values, and general self-esteem. *Journal of Early Adolescence* 14 (2): 107–38.

[f]Anderman, E. M., M. L. Maehr, and C. Midgley. 1999. Declining motivation after the transition to middle school: Schools can make a difference. *Journal of Research and Development in Education* 32 (3): 131–47.

need, (2) whether adolescents who believe smoking will fulfill a need are more likely to smoke cigarettes, and (3) evidence from tobacco company documents about whether cigarette marketing for brands popular among youth conveys that smoking can help satisfy the need.

Marlboro (manufactured by Philip Morris), Camel (R.J. Reynolds), and Newport (Lorillard) cigarettes have reigned as the top three brands smoked by adolescents since the 1980s, when many of the studies in this chapter were conducted. While Marlboro has remained by far the most popular, according to data from the national Teenage Attitudes and Practices Surveys, from 1989 to 1993 Marlboro lost some youth smokers while Camel and Newport gained.[10] A majority of African American adolescent smokers purchased Newports.[10,11] Data from the 2005 National Household Survey on Drug Abuse indicate that, among smokers aged 12–17 years, 48.0% cited Marlboro, 23.2%

cited Newport, and 10.1% cited Camel as the brand smoked most frequently in the month preceding the survey.[12]

A methodology subsection of the main section below relating exposure to tobacco advertising and promotions to adolescent smoking defines the smoking status variables mentioned throughout the chapter.

Need for Popularity and Peer Acceptance and Smoking

Do teenagers think smoking helps make them popular with their peers? Do social needs such as popularity and acceptance, for instance, play a role in encouraging smoking initiation and tobacco use among adolescents?

Perception That Smoking Contributes to Popularity

Evans and colleagues[13] surveyed 3,536 California never smokers aged 12 to 17 years regarding what tobacco advertisements convey to them about smoking. A majority of participants—60.5% of those aged 12 to 13 years, 69.2% of those aged 14 to 15, and 72.9% of those aged 16 to 17—perceived that cigarette advertisements claimed smoking would help them feel comfortable in social situations.

Newport Pleasure advertisement associating smoking with popularity

Romer and Jamieson[14] conducted telephone surveys of 2,002 14- to 22-year-olds to assess exposure to cigarette advertisements and perceptions of smokers. Respondents rated smokers as popular, happy, and attractive. These ratings were higher for adolescents with greater exposure to cigarette advertisements.

Barton and colleagues[15] asked students to rate pictures of youth that were identical except for the presence or absence of a cigarette. Youth pictured with a cigarette received higher ratings as having an interest in the opposite sex and being in a group—traits considered desirable—than those pictured without a cigarette.

Association of Social Needs with Smoking

Perry and colleagues[16] found that 7th, 9th, and 10th graders who thought smoking would help them make friends were more likely to be smokers. Koval and colleagues[17] examined whether 8th graders with high levels of social conformity (measure of compliance and susceptibility to social influence) were more likely to smoke. They found that high-conforming boys (but not girls) were more likely to be smokers.

In a longitudinal study among high school students, Chassin and colleagues[18] found that a belief that smoking can have positive social outcomes was a predictor of whether an adolescent began smoking cigarettes in the following year.

Themes of Popularity and Peer Acceptance in Cigarette Advertising for Youth-Popular Brands

A review of tobacco company marketing research indicates that youth-popular brands

convey an image of smokers of those brands as popular and admired. Documents also indicate that the companies believe that conveying that popular people smoke their brand motivates the choice of that brand. A 1981 memorandum by Philip Morris senior economist Myron Johnston emphasizes this advertising strategy with the statement, "At least a part of the success of Marlboro Red during its most rapid growth period was because it became the brand of choice among teenagers."[19(Bates no. 1000390808)] Philip Morris also studied the need for peer acceptance as a factor in choosing Marlboro cigarettes. For example, a 1998 report concluded that "hollow followers"—those with a high desire for acceptance—were particularly likely to buy Marlboro products.[20] Philip Morris research and marketing documents indicate that the company closely tracked whether the brand conveyed an aura of popularity. The company generally has been successful in conveying that (1) Marlboro is popular,[21–25] (2) Marlboro is "growing in popularity,"[21,22,26–28] (3) the Marlboro smoker is popular,[29,30] and (4) Marlboro's core brand personality includes "popular."[25,31–35] Adolescents who are concerned with being popular, therefore, might be likely to perceive that smoking Marlboro cigarettes could help them achieve this outcome.

R.J. Reynolds also understands the importance of popularity and peer acceptance in motivating adolescent smoking. For example, a July 3, 1974, memorandum on what causes smokers to select their first brand discussed the role of smoking in gaining peer acceptance.

> Men, particularly, report that … they took up smoking because they wanted to impress and be accepted by other young men who smoked. Often the motivation is to be less the target of group aggression. Smoking is often a way to gain entree to a group by effecting an appearance of being mature, sophisticated, sexy or manly.[36(Bates no. 500574162)]

With its Joe Camel campaign, R.J. Reynolds was highly successful in conveying that others would like and admire the Camel smoker. For example, in a series of focus groups conducted for the company in October 1991 with 18- to 24-year-old Camel cigarette smokers, respondents were unusually outspoken about their liking and admiration for the Joe Camel character:

> He's someone you can hang out with—He makes you feel comfortable ... That's a real knack ... I wish I could be so easy to talk to ... I guess it's 'cause he's done and seen everything ... He's what guys really want to be—a man's man but not super macho … He's a natural leader—not pushy, but people just sort of follow his lead ...[37(Bates no. 514340431)]

Lorillard documents show that its marketing of the Newport brand conveys that the Newport cigarette smoker will be popular. A January 1994 Lorillard report described the results of eight focus groups of menthol cigarette smokers. The report stated that African Americans smoke Newport cigarettes "because they perceive Newport as an 'in' cigarette that is popular among their friends and peers."[38(Bates no. 91950199)]

Boys and Masculinity, Girls and Femininity

Smoking and sex appeal: what role do they play in the adolescent psyche? This section addresses the multifaceted relationship between tobacco advertisements and smoking and adolescents' perceptions of and needs associated with their masculinity or femininity.

Perception That Smoking Contributes to Masculinity or Femininity

Many adolescents value success with the opposite sex, often perceived as tied to an adolescent's masculinity or femininity.

Did Joe Camel Attract the Attention of Children and Youth?

While a marked increase in youth smoking became apparent during the height of the Joe Camel advertising and promotions campaign in the early 1990s,[a] a necessary but not sufficient condition to link this upswing to the Joe Camel campaign was to demonstrate that children and adolescents were aware of it. Three studies published concurrently in a 1991 issue of *JAMA: The Journal of the American Medical Association* demonstrated that Joe Camel was well recognized among young people.[b,c,d]

Fischer and colleagues[b] had young children aged 3–6 years match logos to product categories. Among 3-year-olds, 30.4% successfully matched an image of Old Joe to the cigarette category, and among 6-year-olds, 91.3% did, not significantly different from the percentage of 6-year-olds who matched a silhouette of Mickey Mouse (logo for the Disney Channel) to the Disney Channel. The study by DiFranza and colleagues[c] showed Camel advertisements featuring Old Joe, but with all product and brand information removed, to youth aged 12–19 years and adults age 21 years or older. The youth were more likely to say they had ever seen the Joe Camel character than were the adults (97.5% vs. 67.0%), and among those who had seen it, youth were more able to associate the image with the Camel cigarette brand (98.0% vs. 70.1%). Youth were also significantly more likely than were adults to rate the Joe Camel character as "cool" or "interesting," or wanted "to be friends" with him. Finally, Pierce and colleagues[d] computed the percentage of respondents to the 1990 California Tobacco Survey that named Camel or Marlboro as the brand most advertised. Camel was named about as frequently as Marlboro by those aged 12–13 years (34%–35%), with the percentage citing Camel declining steadily with age, so that less than 10% of those age 65 years or older cited Camel as the most advertised brand. Marlboro was cited by increasing percentages by age, peaking among those aged 16–17 years (48%), and then declining to about 20% among those age 65 years or older. Youth, then, seemed to be more attuned to advertising than were adults.

More information regarding the Joe Camel saga is presented in chapters 3, 5, and 8. Also, two articles explore in detail the rise and fall of Old Joe Camel,[e,f] with numerous additional citations from tobacco industry documents and news media.

[a]Johnston, L. D., P. M. O'Malley, and J. G. Bachman. 2002. *Monitoring the Future: National survey results on drug use, 1975–2001. Vol. 1: Secondary school students* (NIH publication no. 02-5106). Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Institute on Drug Abuse.

[b]Fischer, P. M., M. P. Schwartz, J. W. Richards Jr., A. O. Goldstein, and T. H. Rojas. 1991. Brand logo recognition by children aged 3 to 6 years. Mickey Mouse and Old Joe the Camel. *JAMA: The Journal of the American Medical Association* 266 (22): 3145–48.

[c]DiFranza, J. R., J. W. Richards, P. M. Paulman, N. Wolf-Gillespie, C. Fletcher, R. D. Jaffe, and D. Murray. 1991. RJR Nabisco's cartoon camel promotes camel cigarettes to children. *JAMA: The Journal of the American Medical Association* 266 (22): 3149–53.

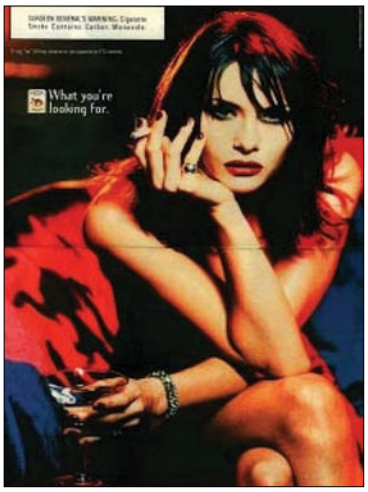
[d]Pierce, J. P., E. Gilpin, D. M. Burns, E. Whalen, B. Rosbrook, D. Shopland, and M. Johnson. 1991. Does tobacco advertising target young people to start smoking? Evidence from California. *JAMA: The Journal of the American Medical Association* 266 (22): 3154–58.

[e]Cohen, J. B. 2000. Playing to win: Marketing and public policy at odds over Joe Camel. *Journal of Public Policy and Marketing* 19 (2): 155–67.

[f]Calfee, J. E. 2000. The historical significance of Joe Camel. *Journal of Public Policy & Marketing* 19 (2): 168–82.

Enhancing these attributes is appealing to teenagers. Barton and colleagues[15] found that, on average, adolescents viewed smokers as tougher, an attribute they viewed positively. Evans and colleagues[13] reported that 43.9% of 12- to 17-year-old female never smokers perceived that cigarette advertisements conveyed that smoking would help them stay thin.

In two samples of adolescent never smokers 11–17 years old, Shadel and colleagues[39]



Advertisements associating femininity and masculinity with cigarettes

assessed positive advertisement effect (n = 29) and personal relevance (n = 101), respectively. In the smaller study, adolescents viewed a balanced random sample of 24 protobacco advertisements, 24 antitobacco advertisements, and 24 neutral advertisements for other products. The researchers previously had categorized the advertisements' valence as masculine, feminine, or gender neutral. In the larger study, participants were asked whether 11 tobacco advertisements did or did not remind them of themselves. Girls were more likely to show a positive affect toward the cigarette advertisements (smaller study) and judge them as self-relevant (larger study) if the advertisements were female valenced. No such relationship was found for boys in either study. The authors concluded, "Female-valenced cigarette advertising imagery may have specific effects on never smoking female adolescents by enhancing positive affect and suggesting that women who smoke hold the same characteristics as do the young women themselves."[39(p.1735)]

Association of Masculinity and Femininity with Smoking

Chassin and colleagues[40] found that adolescents who rated their ideal selves similarly to smokers as "tough," "foolish," "acts big," "disobedient," and "interested in the opposite sex" were more likely to report an intent to smoke. Boys who believe these characteristics will make them more attractive to the opposite sex may see smoking as a way of acquiring or strengthening them.

A number of similar studies have been conducted with adolescent girls, focusing on attractiveness and weight control. French and Perry[41] identified several influences toward smoking that young women focus on, including being attractive and well dressed, having sex appeal, and experiencing weight concerns. Koval and colleagues[17] found that 8th grade girls were more likely to smoke cigarettes if they believed smoking would improve their appearance. French and colleagues[42] found that girls who smoke were significantly more likely than were nonsmokers to try to lose weight, fear gaining weight, want to be thin, and have eating disorders. They found that girls with substantial concerns about their weights were about twice as likely (compared with girls without weight concerns) to begin smoking during the following year. Charlton[43] surveyed 16,000 9- to 19-year-olds in northern England. This researcher found that smokers were more likely, and never smokers were less likely, to agree

that smoking controls weight. More girls than boys among 13- to 16-year-olds agreed with this statement. Finally, a survey of 14- to 22-year-olds found that girls who smoked were significantly more likely than nonsmokers to believe that smoking would reduce weight.[14]

Themes Relevant to Masculinity and Femininity in Cigarette Advertising

Krupka and colleagues[44] found that cigarette advertisements targeting women were significantly more likely than those not targeting them to show lean, attractive smokers. King and others[45] found images of young women as attractive, sexy, independent, and sociable to be common in cigarette advertising. A third study found that billboard advertisements for tobacco depicted models as having sex appeal more often than did those for other products except alcohol.[46]

Much cigarette advertising, especially for Marlboro and Camel, has focused on conveying that smokers of those brands are masculine, tough, and rugged. Marketing research by Philip Morris consistently has shown that its audience perceives the Marlboro man as masculine, independent, and rugged. Since 1992, a marketing research organization has conducted biennial research to monitor the appeal of the Marlboro campaign. For its 1999 report, that organization interviewed 76 young adult male smokers between June and August 1999. It found that "core brand values of freedom, independence/self-sufficiency, and ruggedness clearly come through."[47(Bates no. 2072468465)] A 1999 Philip Morris marketing report lists features of the Marlboro image to include "individualism, adventurousness, freedom, confidence, excitement and mastery";[48(Bates no. 2080930013)] "the masculine ideal"; and "masculinity, freedom, adventure, limitless opportunities, self-sufficiency, mastery of destiny, harmony with nature."[48(Bates 2080930017)] Other Philip Morris documents point to the success of the Marlboro campaign in representing the masculine ideal.[49–51]

An October 1991 report to R.J. Reynolds regarding focus groups conducted on Camel advertising indicated the strong impact of the Joe Camel campaign. A footnote in the report commented on the extraordinary power of the Joe Camel campaign:

> The details recalled and the strength of the favorable CAMEL advertising commentary were considerably beyond what is typically heard in focused groups—be it for cigarettes or other packaged goods—when awareness of/attitudes toward advertising—in the absence of stimuli—are explored.[52(Bates no. 509045392)]

Additional quotes from the report already mentioned earlier illustrate the impact of the campaign on perceptions of Camel smokers as attractive to members of the opposite sex.[53] In contrast, a review of Lorillard documents regarding its marketing of Newport cigarettes does not show that the company uses a theme of masculinity in marketing this brand.

Rebelliousness

This section addresses the dynamic mix of adolescent rebelliousness, smoking, and tobacco advertisements.

Perception That Smokers Are More Rebellious

Chassin and colleagues[54] studied high school student ratings of photographs of boys holding chewing tobacco, a pack of cigarettes, or a bag of corn chips. Compared with the boy with corn chips, the students rated the boy with the cigarettes as significantly more rebellious.

Cigarettes and Sex Appeal

R.J. Reynolds documents indicate that the intent of the Joe Camel campaign was to convey that the Camel smoker was a successful ladies' man. For example, a June 21, 1988, document proposed ways to use promotions to communicate that the Camel smoker would "get the girls."

> Nothing quite captures the imagination for our target as the opposite sex. The CAMEL CONNECTION takes … "Connection" between Camel and one of the main focuses of our target's life.
>
> The program features an endless variety of premiums, give-aways, etc. that play our "Camel Guy" as a real ladies' man, the Camel equivalent of the Playboy bunny, all relatable and done with a very light, funny, fantasy orientation to our target.
>
> Of course, there will be infinite attention paid to the focus of our target's fascination: women. Beautiful, desirable, the kind of females who you wouldn't care if they'd never read Julia Childs.
>
> Yes, this is disgustingly chauvinistic. And yes, it is a very dead-end bullseye with our target.
>
> He's a blond beach god. Well, blond leaning camel.[a]

A 1989 document indicated that in a "consumer ad test," 61% of male smokers aged 18–24 found Joe Camel to be "attractive to opposite sex."[b]

Several Joe Camel ads—some of which were described by the U.S. Department of Justice as part of a racketeering act—featured "smooth moves" and "dating advice."[c(p.33)]

[a]KNT Plusmark. Camel project big idea concept development. 21 Jun 1988. R.J. Reynolds. Bates No. 515686724/6729. http://legacy.library.ucsf.edu/tid/yln92d00.

[b]R.J. Reynolds. "Smooth character" campaign. 1989. R.J. Reynolds. Bates No. 507244164/4184. http://legacy.library.ucsf.edu/tid/lpi54d00.

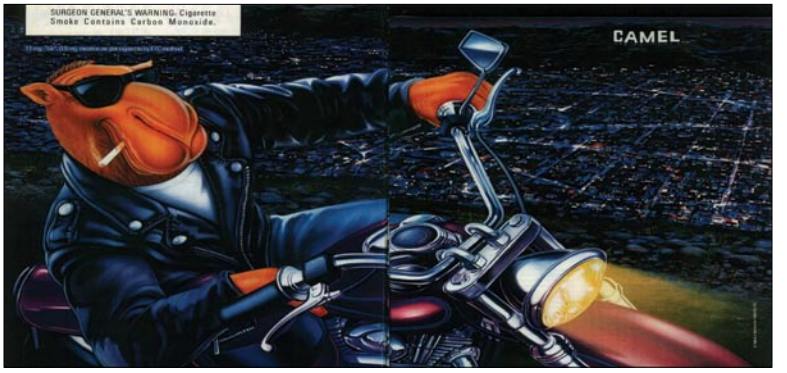
[c]*United States vs. Philip Morris, et al.* Appendix to complaint. U.S. District Court for the District of Columbia. 1999. http://www.justice.gov/civil/cases/tobacco2/appendix.pdf.

Relationship between Rebelliousness and Smoking

A study of 6th graders found that rebelliousness was correlated with smoking behavior for both boys and girls, even when investigators controlled for parental smoking.[55] A study of 8th-grade students revealed that rebelliousness was associated with student smoking. Here, too, variables controlled for parental and peer smoking. Thus, it can be inferred that rebelliousness is associated with smoking over and above any influence of parents or peers.[17] In a longitudinal study of 3,130 5th graders, those high in rebelliousness at baseline were significantly more likely to have smoked by the 12th grade.[56]

Rebelliousness in Cigarette Marketing Images

Camel advertising (and perhaps Marlboro with its emphasis on independence and masculinity), but not Newport, has relied on the rebelliousness theme. In March 1986, R.J. Reynolds issued a report, *Camel New Advertising Campaign Development*. The report stated that the objective of the advertising is to "leverage the non-conformist, self-confident mindset historically attributed to the CAMEL user … so that the brand becomes a relevant, appealing choice for today's younger adult smokers."[57(Bates no. 503969239)] The report outlined R.J. Reynolds's plan for achieving this objective: "The advertising will create



Joe Camel rebelliously riding a motorcycle

the perception that CAMEL smokers are non-conforming, self-confident … younger smokers who project a cool attitude which is admired by peers."[57(Bates no. 503969241)]

A December 1988 report, *Current/Projected Perceptions of Camel among Target Smokers,* states, "the most important user image attributes to target 18–24 year old male smokers are to be perceived as having an independent/individualistic personality, followed by being masculine, admired/accepted by friends. ..."[58(Bates no. 506864590)]

In a January 1991 evaluation of a later version of Joe Camel, R.J. Reynolds reported, "The Evolved Smooth Character campaign is particularly effective among smokers who reject traditional values."[59(Bates no. 509042746)]

In 1994, R.J. Reynolds continued its pursuit of the rebellious audience. A document, *CAMEL DBM [database marketing] Programs: Learning Perspective,* notes that one development objective is to "provide readers with provocative articles that have an attitude of rebellion, adventure, individualism, humor and a lust for living."[60(Bates no. 525511595)]

Sensation Seeking, Risk Taking, and Having Fun

The following discussion considers the appeal to adolescents of having fun, seeking excitement, and taking risks. These themes are prevalent in tobacco advertising and there is evidence that they likely encourage adolescent smoking.

Perception That Smoking Is Associated with Excitement, Danger, or Fun

The literature review did not reveal any studies that specifically evaluate adolescent perceptions related to sensation-seeking and risk-taking behavior as cigarette advertising themes. Evans and colleagues[13] found that 68% to 76% of nonsmoking California teenagers perceived cigarette advertisements as conveying that smoking is enjoyable.

Relationships between Smoking and Sensation Seeking, Risk Taking, or Having Fun

In a study of 1,841 17- to 19-year-olds, Kraft and Rise[61] found sensation seeking to be significantly related to smoking. In a study of 8th- and 11th-grade students, Kopstein and colleagues[62] found that cigarette smoking prevalence was significantly higher among students with a high rating on sensation seeking, even when controlled for measures of peer and parental influences on smoking.

A study of 1,051 10th graders found that those high in novelty seeking were more likely to smoke cigarettes.[63] In a longitudinal study,[56] 5th grade students who rated high in risk taking were found to be more likely

to be daily smokers by 12th grade. This is noteworthy because of the length of time between the measurement of risk taking and the smoking assessment. Skara and colleagues[64] found that males in extended high school were more likely to smoke regularly if they were high in sensation seeking and violence. A study of 1,071 high school freshmen found that higher levels of novelty seeking were associated with greater receptivity to tobacco advertising.[65] Sensation or novelty seekers appeared particularly likely to encounter and like cigarette advertising.

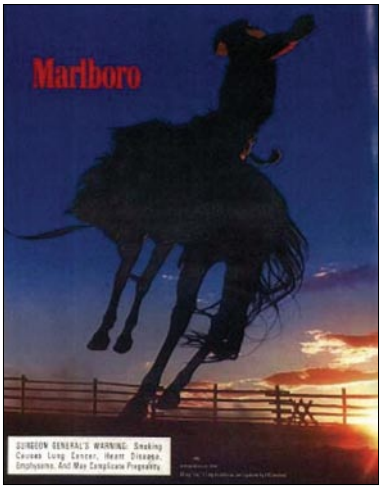
Perry and colleagues[16] found that adolescent smokers were more likely than nonsmokers to say smoking will help them have fun.

Themes of Risk, Sensation, or Fun in Cigarette Marketing

Tobacco companies conduct extensive research to ensure that their advertisements communicate that smoking cigarettes can provide excitement, fun, and adventure. Public health research finds that adolescents get the message. There is evidence that billboard cigarette advertisements—when they still were permitted—associated smoking with fun or exciting activities, including vacationing, recreation, sports, an active lifestyle, and adventure or risk.[66] A study of magazine cigarette advertisements in both male- and female-oriented magazines found recreation and adventure to be common themes.[45]

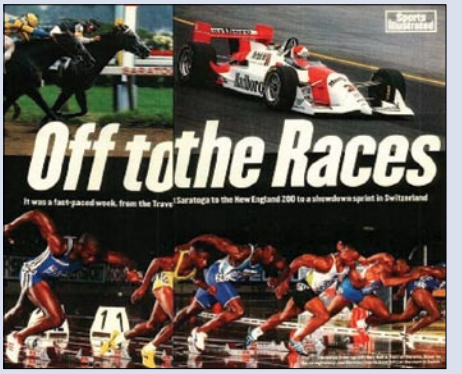
Philip Morris's marketing of Marlboro has long conveyed that the Marlboro smoker leads an exciting and adventurous life. A June 18, 1999, Philip Morris memorandum concerning its direct mail marketing magazine, *Unlimited,* stated, "the magazine has an action/adventure format and tries to represent the core equities of the brand."[67] A 1998 marketing research study found that 67% of "prime prospects" rated themselves as "exciting," implying that themes of excitement would be appealing to them.[29] A November 1999 Philip Morris study, *Marlboro Direct Mail Equity Study,* discusses direct mail marketing efforts, including *Unlimited*; young adult smoker (YAS) equity; and YAS promotional, savings/coupons/mainline mailing, and gear.[68] The report stated that these programs contribute to higher ratings on "active, likes action/excitement, lives life to the fullest."[68](Bates no. 2073318229)

R.J. Reynolds documents indicate that the company often designed its marketing of the Camel brand to associate the brand with having fun and excitement. In February 1985, R.J. Reynolds conducted focus groups among "Camel younger adult smokers." It learned that, "the executions [of the advertisements] were too 'tame' in that they did not elicit enough excitement or enthusiasm."[69](Bates no. 504585738/5739) Three years later, in a November 1988 Winston/Camel Pack Action Study, R.J. Reynolds noted, "Younger adults center their lives on having fun in every way possible and at every time possible."[70](Bates no. 512544536) By 1990, an April review of Camel's performance noted, "the CAMEL 'Smooth Character' campaign seems to deliver that sense of excitement and appeal to its target."[71](Bates no. 507302638)



Marlboro advertisement with the theme of risk taking

Cigarette Marketing Strategy: Going to the Races



Philip Morris assessed respondents' reactions to communication materials related to marketing activities such as advertising at racing events or promotional give-aways of attractive gear. The aim was to determine what each added to the core image of Marlboro. Philip Morris found that, after being exposed to racing marketing communications (mostly auto racing, but horse and human racing as well), respondents rated the following items higher than they had rated the Marlboro core personality: active, adventurous, likes action/excitement, aggressive, a leader, macho, energetic, driven to succeed, masculine, mechanically oriented, upscale, and discriminating/demanding. The report concluded, "Racing is a rich source of excitement, energy and competitive spirit for Marlboro."[a] This study shows how Philip Morris expands Marlboro's core image through its racing programs, which allow it to add the dimensions of excitement and adventure to the brand.[a]

[a]Philip Morris. Marlboro marketing mix study. Feb 1996. Philip Morris. Bates No. 2062311535/1551. http://legacy.library.ucsf.edu/tid/nsl27a00.

Two months later, a Perception Tracking Study targeting 18- to 24-year-old males added, "ads in emphasis markets were successful in getting targets to see Camel as 'for people who lead exciting life styles.'"[72(Bates no. 509042491)] By November 1990, R.J. Reynolds seemed to have achieved the strategy designed five years earlier. A report, *Summary of Findings on Reactions to Camel Advertising and Pack Exchange Program among Competitive Exchange Initiative Smokers,* indicates that Joe is "constantly on an adventure which contains the element of danger."[53(Bates no. 509043739)]

Lorillard's marketing of Newport cigarettes also employs themes of fun and excitement. A November 11, 1993, presentation to Lorillard, titled *Newport Promotional Concepts,* outlined a number of advertising and marketing strategies that involved communicating fun and excitement:

- Build excitement around Newport as an integral part of the urban center lifestyle
- Develop exciting innovative program concepts and overlays with involving and dynamic features that pull the consumer to the brand
- Reinforce brand image and equity in the "pleasure" positioning as developed through previous advertising campaigns[73(Bates no. 91949808)]

A January 1994 Lorillard report addressed the results of eight focus groups with menthol cigarette smokers. It presented a number of findings showing that the *Alive with Pleasure* campaign communicates that Newport smokers have fun:

> **Black Salem/Kool Smokers** relate Newport to fun and excitement.… **Black Newport Smokers** believe that Newport ads send strong, positive messages because they incorporate happiness, togetherness, and people taking part in fun things.… The strength of "Alive with Pleasure [AWP]" is that it depicts settings where fun situations that could include smoking

> are presented.… The strength of "Newport Pleasure" is that the theme centers on the benefits [fun] of a specific brand [bracketed "fun" appears in the original].… AWP … communicates: life, energy, activities, happy times, couples, togetherness, wholesomeness, and fun.… AWP seems to set more of a mood of being upbeat, happy, full of life and energy.[38(Bates no. 91950196/0200)]

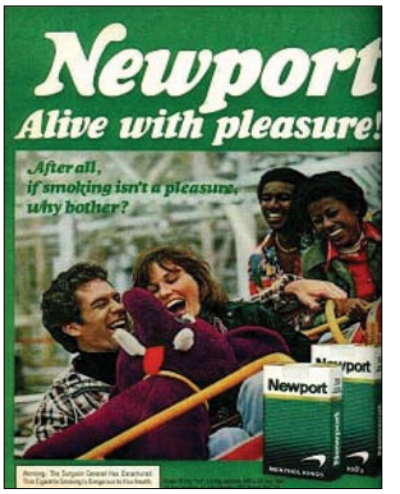
Stress, Anxiety, and Depression

The following considers themes among cigarette advertisements that communicate to adolescents that smoking can help solve some personal and emotional problems by relieving stress and promoting relaxation. In reality, addicted smokers can experience stress, anxiety, irritability, and depression when deprived of nicotine.[74] Thus, adolescents may observe that smokers in their social environment self-medicate these symptoms by smoking cigarettes. As discussed below, cigarette marketing conveys themes suggesting that smoking has a positive emotional benefit.

Perception That Smoking Reduces Anxiety or Depression

When Evans and colleagues[13] studied nonsmoking California teenagers, they found that 60% to 73% (depending on age) felt cigarette advertisements communicated that smoking would help them relax. Of the participants, 58% to 67% said these advertisements indicated smoking could help reduce stress. In addition, 45% to 51% said the advertisements communicated that smoking would reduce boredom.

In another study, among those 14 to 22 years old, Romer and Jamieson[14] found that the perception or image of smokers as relaxed rose during adolescence, significantly for those citing exposure to cigarette advertisements. Those with an image of smoking cigarettes as being relaxing also saw it as less risky and had more favorable feelings toward smoking.



Newport "Alive with Pleasure" advertisement associating smoking with fun

Relationship between Smoking and Distress Reduction

Perry and colleagues[16] found that middle and high school students were more likely to smoke if they thought smoking would alleviate boredom or loneliness or would be of benefit when they had to solve personal problems or needed personal energy.

Several researchers examined the link between high levels of distressing emotions and smoking. Two studies of the same sample (one among 6th graders[55] and one among 8th graders[17]) found that young people under stress were more likely to smoke cigarettes. In a longitudinal study of students in extended high school, Skara and colleagues[64] found that adolescents facing higher levels of stress were more likely to become regular smokers.

Some studies report that depressed adolescents are more likely to smoke cigarettes. A study in a nationally representative sample of 4,023 12- to 17-year-olds found depressed girls more likely than nondepressed girls to smoke.[75]

Another found a relationship between depression and smoking for boys, but not for girls.[17,55] A third study found that high school freshmen with depression were more likely to smoke.[76] This was especially true for those receptive to cigarette advertising. Researchers measured teenagers' receptivity to advertising on the basis of whether they had a favorite advertisement or owned a cigarette promotional item. The study found depressed adolescents to be particularly receptive to cigarette advertising. In contrast, two longitudinal studies failed to establish a link between depression and future smoking;[77,78] they found instead that adolescent smokers at baseline were more likely to report depression in the future than were nonsmokers.

Cigarette Marketing Conveying Themes of Relaxation or Stress Reduction

In the past, Philip Morris used television advertising to associate Marlboro with relaxation. Some television advertisements for Marlboro featured Julie London singing the *Marlboro Song.* The lyrics included "why don't you settle back and have a full flavored smoke. Settle back with a Marlboro. Make yourself comfortable, whenever you smoke, have a Marlboro cigarette. You get a lot to like with a Marlboro, filter, flavor, pack, or box."[79]

Philip Morris continues to associate the Marlboro brand image with relaxation through its print advertisements. A December 1999 report assessing Marlboro advertising among young adult male smokers (YAMSs) stated, "Commonly, YAMS are thought to crave excitement and novelty. But, based on their reaction to 'relaxing' imagery, they also seem to be looking for escape from daily stress."[47(Bates no. 2072468453)]

Philip Morris also used advertisements conveying relaxation for its line extension Marlboro Milds. A Philip Morris document that summarizes research on Marlboro Milds stated, "The laid back tone of the advertising is clearly recognized."[80(Bates no. 2073178944)] The study obtained ratings on "relaxed/laid back" and "tranquil."[80] A September 15, 1998, internal Philip Morris memorandum titled *Marlboro Milds Research Findings* described research on Marlboro Milds advertising involving six focus groups with African American smokers aged 21 to 29 years old. The memorandum stated that "the ads strongly communicated that Marlboro Milds would leave them with a 'mellow feeling' and a sense of 'relaxation.'"[81(Bates no. 2061701079)]

A May 12, 1999, marketing research study for Philip Morris reported that a point-of-sale Marlboro advertisement called *Boots* clearly communicated relaxation and kicking back, while another advertisement called *Windmill* "seemed to convey a strong sense of relaxation."[82(Bates no. 2073373193)]

In 1993, Philip Morris promoted Benson & Hedges cigarettes with a slogan—"Take the edge off"—that promised relief from anxiety.[83] The slogan appeared on all of the items in a Benson & Hedges clothing line.[84]

R.J. Reynolds's Joe Camel campaign communicated that the Camel smoker was able to relax and handle stressful situations with ease. The focus group research conducted for R.J. Reynolds elicited numerous statements from Camel smokers indicating their perceptions that the Camel smoker was cool and laid back. A focus group member described Joe Camel as follows: "Never gets stressed out … He can deal with whatever comes his way.… If something doesn't work out … he just does something else … goes with the flow.… No big deal to someone real flexible like he is."[37(Bates no. 514340432)]

Lorillard also associates relaxation—a theme closely related to the theme of having fun—with Newport cigarettes. Documents indicate that Lorillard marketing effectively associates the Newport brand and Newport smokers with relaxation. For example, the

September 1988 Newport Image Study reported that 48% of respondents said that Newport smokers were relaxed.[85] A January 1994 Lorillard document reported on the results of eight focus groups with 18- to 29-year-old menthol smokers. It stated, "Black Newport Smokers relate Newport to relaxing situations or 'chillin' in pleasant surroundings."[38(Bates no. 91950195)]

Role of Image Enhancement from Cigarette Marketing

This section presents empirical evidence regarding the role of adolescents' self-images and their images of smokers in their motivation to smoke or in actual smoking. Four types of images are relevant: adolescents' self-image, image of smokers in general, particular brand image, and image of smokers of particular brands. Attributes such as "tough," "cool," "masculine," or "adventurous" could apply to each of these image types. The idea is that when the image of the smoker of a specific brand embodies traits adolescents seek, they will want to smoke that brand. For example, a youth who wants to be manly and rugged and believes Marlboro smokers are rugged will smoke Marlboro cigarettes to be manly. The following section addresses adolescents' self-image and image of smokers, describes evidence that the tobacco industry is aware of the issue, and presents experimental evidence from nonrandomized and randomized studies that measured the influence of tobacco marketing on images of smokers.

Self-Image and the Image of Smokers

Table 7.1 summarizes information about eight studies that examined the role of self-image and the image of smokers in influencing adolescents to smoke. Barton and colleagues[15] first examined differences in adolescents' perceptions of smoking and nonsmoking youth by systematically comparing adolescents' ratings of pictures of youth that were identical except for the presence of a cigarette. Sixth graders saw the images of youth with cigarettes as tougher, wanting to be with the group, drinking more, more interested in the opposite sex, less obedient, less good, trying to act older, less likely to do well at school, less wise, less desirable as a friend, and less healthy. Tenth graders viewed the images of the presumed youth smokers as more tough, more likely to drink, more likely to act big, liking to be with the group more, older, less good, less healthy, and less wise. The majority of youth at each age saw some of these characteristics—being tough, having an interest in the opposite sex, and being in a group—as desirable.

The study also examined whether adolescents were more likely to state an intent to smoke if they had an ideal self-image that more closely resembled that of a smoker than that of a nonsmoker (on certain attributes). No such relationship existed for 6th grade boys. However, for 6th grade girls, intent to smoke was higher if a girl's self-image was closer to her image of a smoker on five attributes: wise, relaxed, is good, drinks, and obeys. Among 10th graders, both genders were more likely to intend to smoke if they saw smokers as closer to their ideal as having an interest in the opposite sex.

Chassin and colleagues[54] conducted a similar study, mentioned briefly in an earlier section, examining high school student ratings of photographs of boys holding chewing tobacco, a pack of cigarettes, or a bag of corn chips. Compared with the boy with corn chips, the boy holding the cigarette seemed more rebellious, brave, rough/rugged, likely to use drugs and alcohol, phony, unhappy, lazy, unhealthy, less good at school, and getting along less well with family. Girls who admired the

Table 7.1 Studies of the Relationships among Self-Image, Smoker Image, and Adolescent Smoking

Study	Setting/ sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Aloise-Young et al. 1996[86]	1,222 nonsmokers assessed in grades 5–8 and again in the next academic year	Composite score ratings of self-image and smoker image on three traits: cool, sociable, and smart	Any smoking by follow-up (longitudinal study)	Looking at individual traits, young people whose self-image was consistent with the way they had rated smokers on the traits involving "cool" and "smart" were significantly more likely to initiate smoking.
Amos et al. 1997;[87] Amos et al. 1998[88]	897 adolescents aged 12–19 years	Pictures of youth from youth and style magazines, altered to create one version in which the person held a cigarette and the other in which the young person did not have a cigarette	Ratings of the pictures on a set of attributes	The presence of a cigarette affected how youth rated the photographs. Smoking images were rated as being more druggy, wild, and depressed. In contrast, nonsmoking images were rated as more healthy, rich, nice, fashionable, slim, and attractive. Smokers and nonsmokers differentially rated themselves in the same way they differentiated between smokers and nonsmokers in the photographs. "It is argued that these magazine images of smoking may be acting to reinforce smoking among young people."[88(p.491)] The authors suggest some adolescents use smoking as a strategy for gaining entry to certain groups, e.g., wild, rebellious, not interested in school, or into taking risks.
Barton et al. 1982[15]	286 6th graders and 248 10th graders	Rated pictures of adolescents in which the presence of a cigarette was systematically manipulated	Ratings of the pictures on 12 adjective rating scales (e.g., tough/timid)	A majority at each age saw some attributes—being tough, having an interest in the opposite sex, and being in a group—as good things to want. For 6th-grade girls, intentions to smoke were higher if their self-image was closer to the image of a smoker on each of 5 attributes: wise, relaxed, good, drinks, and obeys. Both male and female 10th graders were more likely to intend to smoke if they saw smokers as closer to their ideal than nonsmokers were on being interested in the opposite sex.

Study	Setting/ sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Burton et al. 1989[89]	122 7th graders	Ratings of self-image, ideal self-image, smoker image, and images in cigarette advertisement. Rated on healthy, wise, tough, and interested in the opposite sex	Rated intention to smoke	Intention to smoke was highest for those with the least difference between self-image and image of smokers. Results indicate these youth had less positive self-images and more positive images of smokers than other students did. The authors argue,"…youth with relatively lower self-concepts, who do not perceive themselves as distinctive in terms of being especially healthy, wise, tough, or interested in the opposite sex, may be drawn toward smoking as a way of 'adding something' to their identity."[p.661]
Chassin et al. 1981[40]	175 9th and 10th graders	Rated attributes of actual self, ideal self, ideal date, smokers, and nonsmokers	Monthly smoking and intentions to smoke	Smokers were more likely than nonsmokers to have a self-concept like that for the image of smoking adolescents (than like that for the image of the nonsmoking adolescent). Nonsmokers whose ideal date was closer to that of the smoker than nonsmoker were more likely to intend to smoke. Those who rated their self-image as closer to the smoking than nonsmoking image in terms of toughness, foolishness, acts big, disobedient, and interested in the opposite sex were significantly more likely to report an intention to smoke.

Note. IV = independent variable; DV = dependent variable.

Table 7.1 Studies of the Relationships among Self-Image, Smoker Image, and Adolescent Smoking *(continued)*

Study	Setting/ sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Chassin et al. (1988)[54]	429 high school students	Pictures of a boy holding (1) a can of chew, (2) a pack of cigarettes, or (3) a bag of corn chips	Ratings of the pictured boy on adjective rating scales (e.g., timid/ brave; rough, rugged, vs. gentle, delicate); compared monthly smokers to never smokers	The smoker was seen as more rebellious, more brave, more rough/rugged, more likely to use drugs and alcohol, as well as more phony, less good at school, more unhappy, more lazy, more unhealthy, and getting along less well with family. Girls who admired the smoker image most were more likely to smoke, and boys who admired the nonsmoker image most were less likely to smoke compared to never smokers.
Perry et al. 1987[16]	1,286 7th graders, and 2,587 9th and 10th graders	Ratings of the functional meanings of smoking (e.g., how much you could get over feeling bored or lonely by smoking)	Ever smoked	Participants were more likely to have ever smoked if they felt that smoking made them feel older.
Shadel et al. 2004[90]	101 never smokers aged 11–17 years	Rated ads with brand information removed: whether the ad did or did not remind them of themselves	Self-conflict scale score	Younger (aged 11–13 years) but not older (aged 14–17 years) adolescents associated the self-conflict scale with ratings that the ads reminded them of themselves, thus suggesting that they looked to the ad imagery for help in defining themselves

Note. IV = independent variable; DV = dependent variable.

smoker image more than the nonsmoker image were more likely to smoke cigarettes ($p < .001$). Boys who admired the nonsmoker more than the smoker image were less likely to smoke ($p < .05$).

Shadel and colleagues[86] assessed the level of self-conflict (i.e., conflicts between personality attributes experienced as part of self-concept development) related to the personal relevance of cigarette advertisements among 101 never-smoking volunteers aged 11–17 years. Brand identification was removed from 11 cigarette advertisements, and volunteers were asked if the advertisements did or did not remind them of themselves. The level of self-conflict was significantly related to advertisement relevance for younger (11–13 years) but not older (14–17 years) adolescents. The findings suggested that younger adolescents appeared "more likely to look to the powerful images displayed in cigarette advertising for help"[86(p.463)] in defining themselves.

Amos and colleagues[87] compared adolescents' ratings of photographs of youth differing only in whether the young person held a cigarette. Adolescents rated those holding cigarettes as higher on tough/hard, tart/tarty, druggy, wild, and depressed. They rated those without a cigarette higher on healthy, rich, nice, fashionable, slim, and attractive. Smokers and nonsmokers differentially rated themselves in the same way they ranked smokers and nonsmokers. The self-images of adolescent smokers were more like adolescents' images of pictured smokers than like their images of the pictured nonsmokers.

In the 1981 study by Chassin and colleagues,[40] 9th and 10th graders rated their real and ideal selves, images of smokers and nonsmokers, and an ideal date. Those rating self-images as closer to smoking than nonsmoking images in terms of tough, foolish, acting big, disobedient, and interested in the opposite sex were significantly more likely to report an intent to smoke. Nonsmokers whose ideal dates more closely resembled smokers than nonsmokers were more likely to intend to smoke. Finally, smokers differed from nonsmokers in having self-images and ideal dates closer to images of smokers than to nonsmokers.

In a longitudinal study, Aloise-Young and colleagues[87] examined a sample of 1,222 5th through 8th graders who rated themselves and an image of a smoker on the attributes cool, sociable, and smart. Those with a self-image consistent with their image of a smoker on any two of these traits were significantly more likely to start smoking cigarettes in the next school year. For individual traits, when a self-image was in line with the way they rated smokers on cool and smart, adolescents were significantly more likely to initiate smoking.

In another study, Burton and colleagues[89] examined 7th graders' ratings of self-image, ideal image, smoker image, and smoker image depicted in advertising. Intent to smoke was highest for those with the least disparity between self-image and smoker image. Analyses indicated that these youth had less-positive self-images and more-positive smoker images than did other students. The authors state, "Youth with relatively lower self-concepts, who do not perceive themselves as distinctive in terms of being especially healthy, wise, tough, or interested in the opposite sex, may be drawn toward smoking as a way of 'adding something' to their identity."[89(p.661)] Perry and colleagues[16] studied how 7th, 9th, and 10th graders felt about smoking. Participants were more likely to smoke if they felt smoking made them feel older.

These studies indicate that many adolescents have certain positive images of smokers (e.g., tough, sociable). They are more apt to start smoking if they see smokers having

traits they desire or that are in line with their self-views. Some traits that smokers are perceived to have would be seen by many people as negative (e.g., druggy, rebellious). However, for a subset of adolescents, these are desirable traits. Thus, adolescents see smokers in terms of traits that some typically consider negative. This finding is consistent with the thesis that adolescents are motivated to smoke, in part, by the images they feel they can achieve or reinforce.

Impact of Marketing on Adolescents' Images of Smokers

Many studies show that adolescents are motivated to smoke cigarettes to achieve the images they have of smokers. Yet, these studies do not demonstrate that cigarette marketing influences adolescents to have these favorable images of smokers. However, a number of nonrandomized and randomized experimental studies in the empirical literature indicate a role for marketing in influencing adolescents' images of smokers. While these experimental studies can establish such a link in the laboratory, it is possible that in a natural setting, not specifically cued to advertising imagery, subjects might have different perceptions of and reactions to smokers and tobacco advertising and promotions.

Nonrandomized Studies

Aitken and colleagues[91] examined whether 6- to 17-year-olds could identify cigarette brands after viewing advertisements with no brand showing. Across three brands, 38% to 83% of those age 12 and 13 years and 52% to 95% of older teenagers could identify the brands. They matched advertisements to thumbnail sketches of the type of person who smoked a brand. By age 10 years, students could match brands to thumbnail sketches of the brand's smoker at better-than-chance levels, showing that they had formed an image of each brand's smoker.

Arnett and Terhanian[92] presented advertisements for five brands of cigarettes (Camel, Marlboro, Kool, Benson & Hedges,

Targeting the Young Smoker's Self-Image

Cigarette companies understand the need of adolescents to adopt and enhance their chosen image. In a 1973 document from R.J. Reynolds, executive Claude Teague wrote:

> The fragile, developing self-image of the young person needs all the support and enhancement it can get. Smoking may appear to enhance that self-image in a variety of ways. If one values … an adventurous, sophisticated adult image, smoking may enhance one's self-image.[a]

The Philip Morris Marlboro Marketing Mix Study from February 1996 notes that "young adult male Marlboro Red smokers" are the "most image-conscious segment." The study involved 2,203 personal interviews in 40 geographically dispersed markets. The sample consisted of 18- to 34-year-olds who smoked Marlboro Red or Marlboro Lights. Without seeing any marketing materials, participants answered the question, "What comes to mind when you think of Marlboro?" After answering, they reviewed a list of statements people use to describe cigarette brands and were asked to rate how well each statement applied to Marlboro. Finally, participants viewed a list of descriptions of different types of people, and researchers asked them "to rate each item on how well it describes Marlboro, the person." Philip Morris used these data to define the Marlboro core image.[b]

[a]Teague, C. E. Research planning memorandum on some thoughts about new brands of cigarettes for the youth market. 2 Feb 1973. R.J. Reynolds. Bates No. 502987357/7368. http://legacy.library.ucsf.edu/tid/act68d00.

[b]Philip Morris. Marlboro marketing mix study. Feb 1996. Philip Morris. Bates No. 2062311535/1551. http://legacy.library.ucsf.edu/tid/nsl27a00.

and Lucky Strike) to 534 adolescents in grades 6 through 12 from seven schools in four U.S. states. They obtained ratings for each advertisement of how frequently the adolescents had seen the advertisement, how well they liked it, and the degree to which the advertisement made smoking appealing. These adolescents saw Marlboro and Camel advertisements more frequently than they saw advertisements for other brands. A larger proportion of these students liked these advertisements (44% Marlboro and 64% Camel) more than the other advertisements and found them more appealing than advertisements for other cigarettes. The findings suggest that brands whose advertising is seen more favorably by youth are more popular with youth. However, none of these comparisons included a statistical analysis.

Arnett[93] conducted a study indicating that the more youth-popular cigarette brands were perceived more positively by adolescents than was advertising for a brand not popular with youth. He presented two advertisements for each of five youth-popular brands (Marlboro, Newport, Camel, Kool, and Winston) and one for a non-youth-popular brand (Merit) to 400 12- to 17-year-old American adolescents. They rated how much they liked the advertisements and how much they thought the advertisements made smoking appealing. The adolescents liked all but two of the advertisements for the youth-targeting brands significantly more than they liked the Merit advertisements. They rated one Marlboro advertisement, two Camel advertisements, and a Kool advertisement as making smoking significantly more appealing than did the Merit advertisement. They liked the Marlboro advertisements significantly more than they liked advertisements for Newport cigarettes.

Unger and colleagues[94] assessed brand recognition among 386 8th-grade students for cigarette, alcohol, and other advertisements that had brand information removed. Students were able to identify the brands for Camel (71.7%), Marlboro (62.5%), and Newport (31.4%) more than for Capri, Kool, Misty, and Virginia Slims. Like the Arnett study cited above, this study suggests that adolescents more readily recognize the advertisements for the cigarette brands that are more popular with youth.

Randomized Experimental Studies

Table 7.2 summarizes information in five studies that experimentally manipulated adolescent exposure to cigarette marketing by randomly assigning adolescents to different study groups. These evaluations of cigarette advertising's impact on adolescents control for other possible influences by randomly assigning adolescents to receive or not receive exposure. This makes it highly likely that adolescents in each condition are equal at the outset. By experimentally manipulating marketing exposure, researchers eliminate the possibility that differences arise from the adolescents' prior experiences. If one group has a more positive attitude or image of smokers, it is due to the exposure (intervention).

Two of the studies evaluated the impact of cigarette advertisements in magazines. Turco[95] experimentally evaluated the impact of cigarette magazine advertisements on adolescents' attitudes toward smoking. She randomly assigned 178 5th, 7th, and 9th graders to look at a magazine with four cigarette advertisements or at the same magazine without any cigarette advertisements. The students had only five minutes to review the entire magazine, but researchers asked them to look at all advertisements. Adolescents who saw the magazines containing cigarette advertisements rated a woman shown smoking more positively than did adolescents who were not exposed to cigarette advertisements. Adolescents who had ever tried smoking and who saw the magazine containing cigarette

Promotion of Smokeless Tobacco Use

Smokeless tobacco is marketed extensively (chapter 4) and is visible at the point of sale in many stores.[a] CDC data for 2005[b] indicate that among U.S. adults, 6.0% of men and only 0.4% of women used smokeless products. Among high school students in 2005, 13.5% of boys and 2.2% of girls reported current use, and among middle school students in 2004, 4.0% of boys and 2.0% of girls currently used smokeless products. Use of smokeless products carries significant health risks,[c,d] and evidence from the national Teenage Attitudes and Practices longitudinal survey suggests that adolescent boys who use smokeless products become cigarette smokers at more than three times the rate compared with nonusers.[e]

Smokeless tobacco products have been heavily promoted among professional athletes, especially baseball players, who provide important role models for children and adolescents.[f,g] Advertising imagery for smokeless products features rugged, good looking, athletic models,[h,i] which are relevant to adolescent image needs. Some advertisements for these products suggested that they could be used without parental awareness, one indication, among others,[j] of specific targeting to youth. Adolescent boys' images of a smokeless tobacco user and self-image were significantly more alike for users than for nonusers.[k] One cross-sectional study related receptivity to smokeless tobacco advertising (being able to name a smokeless brand as most advertised) to product use among adolescent boys, adjusting for smokeless tobacco use by family and friends.[l] This analysis also found a positive association between participation in athletics and smokeless tobacco use. While the data are limited, there is no reason to believe that the effect of advertising and promotions for smokeless products on product use by adolescents is different than that for cigarettes.

[a]DiFranza, J. R., M. Coleman, and D. St Cyr. 1999. A comparison of the advertising and accessibility of cigars, cigarettes, chewing tobacco, and loose tobacco. *Preventive Medicine* 29 (5): 321–26.

[b]Centers for Disease Control and Prevention. 2007. Smoking & tobacco use fact sheet: Smokeless tobacco (updated April 2007). http://www.cdc.gov/tobacco/data_statistics/Factsheets/smokeless_tobacco.htm.

[c]National Cancer Institute. 1989. *Smokeless tobacco use in the United States* (Monograph no. 8, NIH publication no. 89-3055). Bethesda, MD: National Cancer Institute.

[d]National Cancer Institute. 1992. *Smokeless tobacco or health: An international perspective* (Smoking and tobacco control monograph no. 2, NIH publication no. 92-3461). Bethesda, MD: National Cancer Institute.

[e]Tomar, S. L. 2003. Is use of smokeless tobacco a risk factor for cigarette smoking? The U.S. experience. *Nicotine & Tobacco Research* 5 (4): 561–69.

[f]Blum, A. 1983. Using athletes to push tobacco to children: Snuff-dippin' cancer-lipped man. *New York State Journal of Medicine* 83: 1365–67.

[g]Connolly, G. N., C. T. Orleans, and A. Blum. 1992. Snuffing tobacco out of sport. *American Journal of Public Health* 82 (3): 351–53.

[h]Chassin, L., C. C. Presson, S. J. Sherman, and S. Margolis. 1988. The social image of smokeless tobacco use in three different types of teenagers. *Addictive Behaviors* 13 (1): 107–12.

[i]Ernster, V. L. 1989. Advertising and promotion of smokeless tobacco products. In *Smokeless tobacco use in the United States* (Monograph no. 8, NIH publication no. 89-3055), 87–94. Bethesda, MD: National Cancer Institute.

[j]U.S. Department of Health and Human Services. 1992. *Spit tobacco and youth* (OEI publication no. OEI 06-92-0050). Washington, DC: U.S. Department of Health and Human Services, Office of Inspector General.

[k]Chassin, L., C. Presson, S. J. Sherman, L. McLaughlin, and D. Gioia. 1985. Psychosocial correlates of adolescent smokeless tobacco use. *Addictive Behaviors* 10 (4): 431–35.

[l]Choi, W. S., A. J. Farkas, B. Rosbrook, J. P. Elder, and J. P. Pierce. 1995. Does advertising promote smokeless tobacco use among adolescent boys? Evidence from California. *Tobacco Control* 4 Suppl. 1: S57–S63.

Table 7.2 Studies Involving Randomized Experimental Manipulation of Exposure to Cigarette Marketing

Study	Setting/ sample size	Experimental design	Findings
Donovan et al. 2002[97]	100 10- through 12-year-olds	Subjects were randomly assigned to either (1) exposure to a photograph of a pack of Benson & Hedges and a point-of-sale advertisement for Marlboro or (2) exposure to a photograph of a pack of Marlboro and a point-of-sale advertisement for Benson & Hedges.	Compared with seeing the pack, looking at the poster increased positive perceptions of the brand user. In the case of Benson & Hedges, the students who saw the advertisement rather than just the pack were more likely to describe the users as relaxed, interesting, cool, rich, adventurous, and classy. Those who saw the Marlboro point-of-sale advertisement rated Marlboro smokers as more adventurous than did students who saw only the picture of the pack.
Henriksen et al. 2002[98]	385 8th and 9th graders from 5 ethnically diverse schools	Classrooms assigned to 1 of 4 cells of a 2 × 2 design. The first 2-level factor was (1) exposure to photographs of a convenience store containing tobacco advertisements and displays or (2) exposure to pictures of a convenience store without tobacco advertising. The second 2-level factor was (1) newspaper clipping about a tobacco policy issue, or (2) newspaper clipping about youth food purchases.	Those exposed to cigarette advertising: (1) perceived that it would be easier to purchase cigarettes in the pictured stores, (2) perceived that it would be easier to purchase cigarettes in other stores, (3) perceived a higher prevalence of adolescent smoking, and (4) expressed less support for policies to control tobacco use. The type of story students read had no effect on these variables.
Pechmann and Knight 2002[99]	718 9th graders from 4 ethnically diverse California high schools	Students were individually assigned at random to 1 of 8 12-minute videotapes about teenagers, using a 4 × 2 design. The tapes differed in advertisements they contained. There were four levels of the advertisement condition: (1) 4 cigarette advertisements, (2) 4 antismoking advertisements, (3) 4 cigarette advertisements and 1 antismoking advertisement, and (4) 4 control advertisements not involving smoking. The tapes also varied in that they either (1) showed a smoking teenager or (2) showed a nonsmoking teenager. According to the authors, the videotapes did not make the advertisements conspicuous.	Students exposed to cigarette advertisements had significantly more positive beliefs about smokers. Those who saw both cigarette advertisements and adolescents smoking had significantly more positive beliefs about smokers and more positive intentions to smoke in the future. The impact of exposure to cigarette advertisements and to smoking adolescents on intentions to smoke was mediated by its effect on their beliefs about smokers. Those who saw the advertisements with the teenage smokers remembered the advertisements significantly more than those who did not see the smokers. The impact of exposure to advertisements and to smoking adolescents on beliefs and intentions was significant even when students did not recall seeing advertisements. There were no differences found depending on whether or not the student was susceptible to smoking.

Table 7.2 Studies Involving Randomized Experimental Manipulation of Exposure to Cigarette Marketing *(continued)*

Study	Setting/ sample size	Experimental design	Findings
Pechmann and Ratneshwar 1994[96]	304 7th graders	Students were assigned at random to 1 of 6 cells of a 3 × 2 design. Three levels of advertisement type (cigarette, antismoking, or unrelated to smoking) were used. Students were asked to rate a pictured student who was described as either a smoker or nonsmoker. Students were exposed to (1) magazine advertisements for Newport, Virginia Slims, and Camel or (2) three advertisements unrelated to smoking.	Students who saw cigarettes advertisements had a greater proportion of positive thoughts about smokers (e.g., "has lots of friends," "likes to do exciting things") than did students who saw the unrelated advertisements.
Turco 1997[95]	178 5th, 7th, and 9th graders	Participants were randomly assigned to review for 5 minutes either (1) a magazine with 4 cigarette advertisements or (2) a magazine without 4 cigarette advertisements.	Adolescents who had ever tried smoking and were exposed to cigarette advertisements expressed more positive attitudes toward smoking than those not exposed to advertisements. Adolescents exposed to advertisements also rated a woman shown smoking more positively than did adolescents not exposed to advertisements.

advertisements expressed more positive attitudes toward smoking than did such adolescents who were not exposed to the advertisements. Pechmann and Ratneshwar[96] compared the impact of magazine advertisements for Newport, Virginia Slims, and Camel cigarettes with the effect of three advertisements unrelated to smoking in randomized groups of 304 7th-grade students. The authors prepared a magazine especially for the study by inserting advertisements into the magazine. Exposure to the cigarette advertisements influenced participants to have more positive thoughts about smokers (e.g., "has lots of friends," "likes to do exciting things") than was true for students who saw the unrelated advertisements.

Point-of-sale advertisements also have been studied. Donovan and colleagues[97] randomly assigned 100 10- to 12-year-olds to see either a photograph of a Benson & Hedges cigarette pack and point-of-sale advertisements for Marlboro or a photograph of a Marlboro pack and Benson & Hedges point-of-sale advertisement. Seeing a point-of-sale advertisement instead of just a picture of a cigarette pack led to more positive descriptions of the brand user. With Benson & Hedges, 10- to 12-year-olds seeing the advertisement rather than just the photograph of the pack were more likely to describe users as relaxed, interesting, rich, and adventurous. Ten- to 12-year-olds who saw the Marlboro point-of-sale advertisement rated Marlboro smokers as more adventurous than students who saw only the pack picture. Thus, in both cases, compared with seeing a pack, looking at a single point-of-sale advertisement increased positive perceptions of a cigarette brand's user. This provides evidence that cigarette advertising influences adolescents to view smokers more positively and fosters peer acceptance for those influenced to smoke.

Whether adolescents misattribute the influence of advertisements as an influence

of smokers in the social environment also has been studied.[99]

> A positive smoker stereotype that is activated by cigarette ads may cause youth inadvertently to seek out favorable evidence about smokers. Seemingly due to this favorable evidence, but in actuality because the cigarette ads drove perceptions to be favorable, youth may gradually come to believe that smokers have desirable traits.… Accordingly, they may become interested in smoking themselves.… Since this process is nonconscious, youngsters may be unable to protect themselves.[99(p.6)]

These researchers randomly assigned 718 9th-grade students from four ethnically diverse California schools to view one of eight videotapes depicting a "slice of life" of people their age. Each videotape described students studying advertising and with assignments to videotape advertisements. Videotapes varied in terms of advertisements shown, with four possibilities: (1) four cigarette advertisements, (2) four antismoking advertisements, (3) four cigarette advertisements and one antismoking advertisement, and (4) four control advertisements not involving smoking. The videotapes varied in terms of whether they showed teenagers as smokers or nonsmokers. In a 4×2 design, one-half in each condition saw teenagers depicted as smokers and the other one-half as nonsmokers. These researchers created a scale of stereotypical beliefs about adolescent smokers. The scale included 12 items to consider: fun/boring, well-liked/disliked, sexy/not sexy, desirable/undesirable to date, successful/unsuccessful, smart/dumb, intelligent/stupid, healthy/unhealthy, well/sickly, natural smelling/stinky, cool/uncool, and winner/loser. Those exposed to cigarette advertisements and nonsmoking teenagers in the videotapes rated adolescent smokers significantly more positively on this scale of beliefs. This finding shows that advertisements alone can influence a favorable view of smokers. As predicted, those who saw both cigarette advertisements and adolescents smoking had significantly more positive beliefs about smokers and had a more likely intent to smoke. These findings indicate that, in addition to its direct impact on adolescents' views of smokers, cigarette advertising primes adolescents' reactions to smokers in ways that improve their attitudes toward smokers and increase their own intent to smoke. This is consistent with the Romer and Jamieson[14] study of cigarette advertising influencing adolescents to view smoking more favorably, making it more likely peers will accept them if they smoke cigarettes.

Pechmann and Knight[99] also found that students' beliefs about smokers and intentions about smoking changed. They found a significant effect of exposure to advertisements and to smokers on beliefs and intentions, even when a student did not recall seeing the advertisements. They write

> Cigarette advertising can augment the impact of peer smokers by enhancing perceptions of individuals. Youth may mistakenly assume that they have been swayed by smokers, not by ads, because smokers are the more obvious influence agent. Hence, self-reported reasons for smoking may be misleading.[99(pp.14–15)]

Another experimental study shows that marketing affects adolescents' perceptions of the availability of cigarettes and the prevalence of adolescent smoking. Henriksen and colleagues[98] showed a random one-half sample of 9th graders photographs of a convenience store with no cigarette advertisements and the other one-half a store with several cigarette advertisements. Those who saw the store with advertisements perceived that they could more easily buy cigarettes there, thought they could more easily purchase cigarettes in general, perceived a higher prevalence of adolescent

smoking, and expressed less support for policies to control tobacco use.

Together, these experimental studies provide strong support for the inference that cigarette marketing influences adolescents to have images of smoking and smokers that are more positive, and affects adolescents' perceptions of how many of their peers smoke—factors shown to predict smoking initiation.[100] Under these experimental conditions, just one exposure to cigarette advertising influences the images adolescents have of smokers. Typically, adolescents are exposed to a multitude of cigarette advertisements. Key motivating images adolescents have of smokers are exactly the ones conveyed in advertisements for youth-popular brands. Thus, to the extent that tobacco companies shape adolescents' images of smokers through advertising, they influence adolescents to smoke.

Evidence of Effects of Exposure to Cigarette Marketing on Adolescent Smoking

This section reviews the considerable body of empirical evidence accumulated over the past 30 years about the influence of exposure to cigarette marketing on adolescent smoking behavior. The first section addresses methodological issues including study design and the measurement of both smoking behavior and exposure to advertising. Subsequent sections describe the findings from cross-sectional and longitudinal study designs.

Methodological Issues

Study Design

From a methodological perspective, three types of studies may be applied to examine the relationship between cigarette advertising and smoking behavior: (1) cross-sectional, (2) longitudinal, and (3) experimental (discussed earlier in "Randomized Experimental Studies"). In contrast to experimental studies, surveys capture information about exposure to tobacco advertising and promotions in a more natural setting. Also, if conducted on a population sample and appropriately weighted, survey findings can be generalized to the population. Cross-sectional studies examine the relationship between one or more measures of exposure to cigarette marketing and a measure of smoking behavior obtained at the same time. These studies provide relatively weak support for a causal inference. This is because the observed relationship can be due to the fact that those who smoke or have a greater inclination to smoke pay more attention to cigarette marketing after the development of their interest in smoking. Longitudinal studies provide stronger evidence regarding the influence of cigarette marketing on adolescent smoking. They can demonstrate that exposure occurred before the changes in smoking behavior. The main limitation in longitudinal studies is that typically not all people in the original sample are successfully followed, and generally, those most likely to smoke are lost from the sample. Although appropriate sample weighting can ameliorate this bias, the statistical power to identify an association is reduced. Also, a longitudinal relationship could be due to some other variable that influenced both exposure at the first assessment and later smoking behavior.

A number of the cross-sectional and longitudinal studies that examined an association between cigarette advertising and smoking behavior included other variables suggested by existing theory or evidence to influence smoking. For example, social influences such as family or peer smokers may both model smoking behavior and lead adolescents to encounter cigarette marketing. An older sibling may give an

adolescent a cigarette promotional item that influences the teenager to experiment with smoking. This would not necessarily mean that marketing had no influence, since without exposures to marketing, social influences could be less effective. Controlling statistically for social influences and finding that tobacco marketing exposure is related to or predicts future smoking provide greater confidence that the social influences do not account entirely for the exposure-smoking relationship.

The most definitive evidence of the influence of cigarette marketing on youth smoking would involve experimental manipulation of adolescents' long-term exposure to cigarette marketing and assessment of its impact on adolescents' initiation of smoking. With appropriate randomization, such a study would control for preexisting differences among adolescents in prior exposure to marketing as well as social influences to smoke. In that way, one could be confident that the exposure led to the smoking. However, such a study would be unethical or infeasible. One way to conduct this type of experiment would be to randomly assign a group of young people to receive high levels of cigarette marketing while others would experience the environment as it normally exists. Given existing evidence of the impact of cigarette marketing on adolescents, a study of this nature would risk addicting adolescents to cigarettes and would thus be unethical. Alternatively, one group could be assigned to experience the prevailing advertising environment, and the other could receive no advertising at all. However, attaining a control group with no exposure to cigarette marketing would not be feasible, since it would require the cooperation of tobacco companies.

Measures of Smoking Behavior

The smoking initiation process consists of a continuum of stages or phases.[1,101–103] Many young children unexposed to smoking in their immediate social environment are not even aware of it. As they become older, inevitably it will enter their consciousness, and they may or may not be curious about it. Because of education about the dangers or social undesirability of smoking, some will adamantly deny that they would ever try a cigarette. However, their curiosity may lead them to pay attention to tobacco advertising and promotions, and both factors may play a role in their developing a susceptibility to smoking and/or experimenting in the future. For some, a few puffs or a single cigarette may be the extent of their smoking experience because their curiosity is satisfied. However, for others, experimentation will continue, perhaps intermittently, for months or even years. Eventually many of these experimenters develop a regular or established pattern of smoking. Regular smokers can smoke daily or occasionally.

Some researchers examine forward movement along this continuum as an outcome. When adolescents no longer adamantly deny that they would try a cigarette (even if offered by a friend), researchers consider them susceptible to smoking.[104] Other studies reviewed below have further validated the susceptibility measure as highly predictive of future smoking.[103,105] Some researchers consider ever smoking (even a few puffs) as smoking initiation. Others focus on current smoking, usually defined as smoking on any day in the past month.[1] A common measure of established smoking is a report of having smoked at least 100 cigarettes in one's lifetime.[106]

Measures of Exposure to Marketing

As background, this section describes various constructs used to measure different facets of exposure to tobacco marketing. It gives the conceptual name to each one as typically applied by investigators. Different researchers sometimes use the same

constructs but different terms to designate them. Many studies use more than one of these measures.

- **External estimates of exposure.** Exposure to marketing stimuli is estimated on the basis of external (to the adolescent) measures of potential adolescent exposure to a source of advertising, such as what magazines they read or what types of advertising appear in stores they are likely to frequent.[107] Knowing the level of advertising in these external sources allows an indirect and external measure of likely adolescent exposure to tobacco advertising.
- **Self-reported exposure to marketing.** These are adolescent reports of exposure to various types of marketing (e.g., billboards, point-of-sale advertisements). Respondents do not indicate if they recall specific advertisements or brand advertising.[108] The frequency of such exposure may or may not be assessed. This category includes measures of awareness of advertising (e.g., can you name a cigarette brand).[109]
- **Self-reported recall.** Reports of advertisements or other marketing stimuli that respondents specifically recall seeing.[110]
- **Brand recognition.** The ability to name a brand when such information is missing or deleted from sample advertisements.[94]
- **Attitudes toward, liking for, or opinions or beliefs about advertising.** Respondents rate their favorability or unfavorability toward tobacco advertising in general.[111]
- **Beliefs about the impact of cigarette advertising.** Respondents rate how much they believe that cigarette advertisements affect them or others.[112]
- **Receptivity to tobacco marketing.** This is a multicomponent index of adolescents' disposition toward tobacco marketing. Evans and colleagues[13] included five components in their index of receptivity: (1) the number of positive messages that they indicated advertising conveyed, (2) naming a brand of a favorite advertisement, (3) naming a brand they would buy if they bought cigarettes, (4) ownership of a cigarette promotional item, and (5) willingness to use a cigarette promotional item. Levels beyond the first are more than just exposure; they reflect a positive attitude toward cigarette marketing. Feighery and colleagues[113] defined receptivity in terms of "see" (recall of reported exposure to magazines, billboards, or convenience stores), "want" (desire for promotional items or saved coupons), and "own" (ownership of a promotional item).

On the basis of the theoretical concepts regarding media effects presented in chapter 2 of this monograph, measures that capture attitudes, liking, beliefs, or receptivity are more likely to be related to present or future smoking behavior than are measures of external exposure, self-reported exposure, or recall or brand recognition.

One study explored the relationships among some of these various measures. Unger and colleagues[114] factor analyzed relationships among various measures of protobacco and antitobacco advertising. They identified four factors: (1) perceived pervasiveness of protobacco advertising, (2) perceived pervasiveness of antitobacco marketing, (3) recognition of specific antitobacco marketing, and (4) receptivity to protobacco marketing.

The variety of measures of exposure is not necessarily a weakness in this body of research. To the extent that diverse measures of exposure have a relationship with diverse measures of smoking behavior or susceptibility to smoking, there is greater confidence that the findings are not simply due to artifacts of a particular method of measurement.

Cross-Sectional Studies

Table 7.3 presents summary information about cross-sectional studies of the relationship between various measures of exposure to cigarette marketing and adolescent smoking behavior measures. Altogether, 52 such studies were located using the search procedures described earlier. The summary of the findings of these studies is organized according to the measures of exposure the investigators used. Some studies are mentioned more than once, because they analyzed multiple exposure measures in different categories.

External Estimates of Exposure

Four studies estimated adolescents' exposure to cigarette marketing on the basis of exposure to settings known to contain marketing stimuli. Wakefield and colleagues[107] derived estimates of adolescents' exposure to marketing of Marlboro and Camel cigarettes from direct observation measures of the amount of advertising and promotions these brands had in a population-based sample of convenience stores. They then related the share of voice for these brands (share of total cigarette advertising) in the convenience stores with the brand choice of high school students attending schools near each convenience store. Adolescents were more likely to smoke Marlboro cigarettes when their schools were near convenience stores with a greater share of the interior and exterior cigarette advertising for that brand and when the stores had more Marlboro advertising for a "gift with purchase." Adolescents were more likely to be Camel cigarette smokers if the stores near their schools had a greater share of interior advertising devoted to Camel. However, share of exterior advertising for Camel had a negative relationship to smoking Camel cigarettes.

Henriksen and colleagues[134] estimated adolescents' exposure to marketing stimuli in convenience stores by obtaining student reports of the frequency of their visits to these stores. They found that weekly exposure to convenience stores was associated with a 50% increase in the odds of ever smoking. The study controlled for social influences on smoking. Ledwith[137] reported that adolescents' exposure to televised snooker (a game similar to pool) competitions sponsored by cigarette brands was associated with greater knowledge of cigarette brands. However, Sin[147] found that adolescent-reported exposure to print media that contained cigarette advertising was not associated with smoking status. Smokers and nonsmokers reported similar levels of exposure.

Finally, Carson and colleagues[123] asked 967 12th graders how many hours per week they read magazines and watched television or videotapes. Four types of magazines were queried: fashion, entertainment/gossip, health/fitness, and sports/activities. In a path analysis, exposure to fashion and entertainment/gossip magazines had an indirect effect on smoking behavior through a drive for thinness and tobacco advertisement receptivity.

Self-Reported Exposure, Awareness, or Recall of Specific Advertising

Of 23 studies that measured adolescents' self-reported exposure to advertising, awareness of cigarette advertising, or recall of advertisements,[46,91,93,108,114,116–119,121,122,124,130,132,134,136,138–140,147–150] 8 studies reported on nine samples in which there was a significant positive relationship between exposure, awareness, or recall and susceptibility to smoking or positive intention to smoke.[114,117,119,121,122,130,132,150] Further, these 23 articles reported 17 significant positive relationships between measures of exposure, recall, or awareness and smoking status. One replicated the relationship between exposure and smoking status at two different times.[122] As an example of a

Table 7.3 Cross-Sectional Studies of the Association of Tobacco Marketing with Adolescent Smoking

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Ahsan et al. 1998[115]	667 males (555 in 2 metropolitan high schools and 112 from urban slums) in Dhaka, Bangladesh	Recognition of brand for cigarette advertisements that lacked brand information	Current smoker: smoked at least 1 cigarette or bidi per week	Middle-class student smokers could better recognize tobacco advertisements than could nonsmokers (by the authors' definition of smoker, this would include experimenters or occasional users). Among slum youth, a higher proportion of nonsmokers than smokers recognized all three advertisements. Half of students said cigarette advertisements influence young people to start smoking.
Aitken and Eadie 1990[116]	848 11- to 14-year-olds in Glasgow, Scotland	Recall (number of brands seen advertised) and attitudes toward, recognition of cigarette advertising	3 levels of smoking experience: (1) nonsmokers—never tried; (2) triers—at least 1 cigarette, but do not smoke now; and (3) smokers—smoke now	Smokers were better at recalling and recognizing cigarette advertisements than were nonsmokers. A discriminant analysis showed that smokers differed significantly from nonsmokers on ability to recognize cigarette advertisements and in attitudes toward advertisements. Triers were intermediate, between smokers and nonsmokers. The analysis also included social influences on smoking.
Aitken et al. 1987[91]	726 6- to 17-year-olds in Glasgow, Scotland	Recall (whether they had seen an advertisement before—labeled recognition in this study) and recognition of cigarette brand (labeled identification in this study)	3 levels of smoking experience: (1) nonsmokers—never tried; (2) triers—at least 1 cigarette, but do not smoke now; and (3) smokers—smoke now	Proportionally more smokers or triers than nonsmokers said they had seen the cigarette advertisements. Proportionally more smokers or triers than nonsmokers could name the brand for advertisements without brand information. At age 10 years, children could match a smoker image description to brands at greater-than-chance levels. This ability was not related to smoking status.
Altman et al. 1996[117]	1,047 12- to 17-year-olds contacted via random-digit dialing in CA	Awareness of tobacco promotions, knowledge of friend owning promotional item or taking part in a promotion, and receipt of free samples or direct mail from tobacco companies	3-level smoking status: (1) never smoker, not susceptible; (2) noncurrent smoker, susceptible; and (3) current user, also considered susceptible	A strong association was found between awareness of and involvement with tobacco promotions and being susceptible to tobacco use or already using tobacco products. Evidence was found of a dose-response relationship between susceptibility index and subsequent tobacco use.

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Aloise-Young et al. 2006[118]	242 middle and high school students surveyed in health class in one school district in CO	Index of exposure to magazines containing (and extent of) tobacco advertising; self-report of level of attention paid to the tobacco advertising; recognition of advertisements with brand information removed	Multilevel composite measure of smoking status, frequency, and consumption level	Attention to advertising and advertisement recognition was significantly related to smoking after adjusting for passive peer pressure index. Magazine advertising exposure index was significantly related to smoking index only among 7th graders. Significant interaction exists between exposure and passive peer pressure and smoking as well as a similar significant interaction for attention paid and for advertisement recognition and passive peer pressure.
Arnett 2001[93]	400 12- to 17-year-olds (100 smokers; 300 nonsmokers) surveyed in shopping malls in AZ and WA (200 in each state)	Awareness of and response to advertisements for several youth and 1 adult brands of cigarettes. Questions included how often seen (recall), how much liked; and does it make smoking appealing.	Any smoking in the last 30 days	All adolescents were more likely to like and find the youth brands (but not the adult brand) appealing. Smokers (in past 30 days) were more likely to like, and find the advertisements for most of the youth brands more appealing, than were the other adolescents.
Arnett and Terhanian 1998[92]	534 11- to 18-year-olds in a convenience sample of 7 schools in 4 states: NY, PA, OH, and TX	Print advertisements for 5 brands shown; ratings of how often seen (recall), liking, whether it made smoking appealing, and whether it made them want to smoke	Ever smoking	Ever smokers reported seeing Marlboro cigarette advertisements more than nonsmokers. Smokers liked advertisements for all 5 brands significantly more than did nonsmokers. Smokers rated Marlboro and Camel advertisements more appealing than did nonsmokers. Smokers rated all brands higher than did nonsmokers on making them want to smoke.
Audrain-McGovern et al. 2003[65]	1,071 high school freshmen from 5 public high schools in northern VA	Receptivity to tobacco advertising and marketing	Ever smoking and novelty-seeking personality	Having ever smoked was positively associated with receptivity to tobacco advertising as was a novelty-seeking personality. The study controlled for social influences.

Note. IV = independent variable; DV = dependent variable.

Table 7.3 Cross-Sectional Studies of the Association of Tobacco Marketing with Adolescent Smoking *(continued)*

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Borzekowski et al. 1999[119]	571 7th graders from 5 middle schools in San Jose, CA	Self-reported exposure to prosmoking messages, including family, friends, acquaintances, and strangers who seem to condone smoking, and media messages (e.g., billboards, magazines, in stores, promotional materials)	4 categories of smoking susceptibility, based on both smoking experience and intent—"lack of firm resolve not to smoke in the future": (1) no smoking experience, no intent; (2) experience, but no intent; (3) experience and intent; and (4) current smokers; also perceived influence of advertising	Those with high exposure to cigarette marketing had higher ratings of perceived influence of advertising. Exposure to cigarette marketing was associated with smoking susceptibility (according to the four categories as shown), even when controlling for social influences to smoke.
Botvin et al. 1991[120]	375 students (146 7th graders, 121 8th graders, and 108 9th graders) from 2 junior high schools in a suburban NY community	Recognition of brands for advertisements that had the brand information removed	3-level status: (1) nonsmokers—never and not in past 12 months; (2) experimenters—1 or 2 cigarettes in past year or a few times per month; and (3) smokers—a few times each week to >1 pack/day	Adolescents with higher advertisement recognition were more likely to be smokers.
Botvin et al. 1993[121]	602 adolescents (28% in 7th grade; 72% in 8th grade; 48% male; 82% white) in middle-class, suburban schools	Self-reported exposure to cigarette advertising	7-level scale of smoking experience, from never to current smoking and amount of current smoking. Also, intent to smoke in next 2 years	Exposure to cigarette advertisements was associated with current level of smoking experience and intentions to smoke, even when controlling for friends smoking.
Braverman and Aaro 2004[122]	Two samples of Norwegian youth aged 13–15 years. In 1990, $n = 4,282$; in 1995, $n = 4,065$	Self-reported exposure to any advertisements for tobacco products	Current smoking status (daily, occasionally, and never) and expectation that would smoke at age 20 years (definitely yes, probably yes, probably no, and definitely no)	In both samples, smokers (both daily and occasional) and those who expected to smoke were significantly more likely to report exposure to tobacco advertising, even when exposure to social influences was controlled.

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Carson et al. 2005[123]	967 12th graders in 5 northern VA public high schools	Hours/week reading various types of magazines, receptivity to tobacco advertising and promotions, and drive for thinness	5-level scale of smoking experience: (0) never, (1) puffer, (2) whole cigarette, (3) current but <100 cigarettes in lifetime, and (4) current established, ≥100 cigarettes in lifetime	A path analysis showed that fashion/ entertainment magazines had an indirect affect on smoking level through tobacco receptivity and drive for thinness, with a dose-response relationship through this link, while controlling for social influences to smoke.
Chang 2005[124]	1,490 Taiwanese high school students	Attention paid to cigarette advertising in magazines and at point of sale, and attitudes toward cigarette advertising	Smoking in the past 30 days	Both attention paid and attitudes toward cigarette advertising were significantly related to smoking. A "hedonistic" factor derived from a factor analysis of values-based questionnaire items was positively associated with both smoking status and the advertising variables.
Chapman and Fitzgerald 1982[125]	1,195 7th and 8th graders in Sydney, Australia	Recognition of tobacco brands and slogans through use of blinded advertisements	Smoking: any smoking in the past 4 weeks	In every case but one, nearly twice the proportion of smokers than nonsmokers could correctly recognize tobacco advertisements and slogans.
Chen et al. 2002[126]	20,332 randomly sampled 12- to 17-year-old boys and girls in CA	Receptivity to protobacco media (having favorite brand advertisements, having ever received a promotional item, willingness to use a promotional item, and having formed a preference to buy particular cigarette brand)	Smoking: any smoking in past 30 days	A consistent dose-response relationship was found between receptivity to protobacco media and 30-day cigarette smoking, even when controlling for social influences to smoke. Having a cigarette brand preference also was associated with smoking.
Diaz et al. 1998[127]	1,003 Spanish schoolchildren (aged 11–13 years)	Were asked: "Do you believe that it is [all right] that there is tobacco advertising?"	Smoking status: never, experimenter, regular (weekly or daily)	A significant association was found between affirmative response to questions about advertisements and ever smoking (experimenters and regular smokers) and regular smoking. However, in a multivariate logistic regression adjusting for other attitudes and beliefs about smoking as well as smokers in the social environment, opinions about tobacco advertising were not related to smoking.

Note. IV = independent variable; DV = dependent variable.

Table 7.3 Cross-Sectional Studies of the Association of Tobacco Marketing with Adolescent Smoking *(continued)*

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Emri et al. 1998[128]	1,093 children aged 7–13 years, from grades 2–5 in Ankara, Turkey	Recognition—matched logos and brand names to product type	Ever smoking	Camel logo and Samsun (Turkish cigarette) and Marlboro brand names were most highly recognized of all products tested. Rates of recognition for cigarette brands were not related to ever smoking.
Evans et al. 1995[13]	3,536 adolescent never smokers contacted via random-digit dialing in the California Tobacco Survey	Receptivity to tobacco advertising and exposure to smokers	Susceptibility to smoking: never smokers who do not rule out trying a cigarette or taking one from a friend, if offered	Receptivity to tobacco advertising and exposure to smokers were independently associated with susceptibility to smoking among never smokers, but the relationship appeared stronger for receptivity to advertising.
Feighery et al. 1998[113]	571 7th graders from 25 randomly selected classrooms in 5 middle schools in San Jose, CA	Receptivity to tobacco marketing strategies	3-level status: (1) never smoker resolved not to smoke; (2) has smoked, but resolved not to smoke again; and (3) has smoked but no clear resolve not to smoke again/susceptible	Receptivity to tobacco marketing materials was found to be strongly associated with susceptibility, even when controlling for social influences.
Gilpin et al. 1997[129]	5,531 youth (aged 12–17 years) surveyed in 1993; 1,735 youth (aged 12–17 years) and 4,170 adults surveyed in 1994	Possession of and willingness to use cigarette promotional items	Current smokers (in past 30 days) vs. nonsmokers. Never smokers not susceptible vs. susceptible to smoking (does not rule out trying a cigarette soon, in the next year, or accepting one if offered by best friend)	Among adolescents, current smokers were significantly more likely than nonsmokers to report possession of cigarette promotional items. Among adolescent nonsmokers, having cigarette promotional items appeared to be associated with smoking susceptibility. Thirty percent of susceptible adolescent never smokers were prepared to use a cigarette promotional item. Overall, a strong relationship was found between smoking status and willingness to use a promotional item.

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Goldberg 2003[130]	Over 1,700 14- to 17-year-old Hong Kong students	Recall of cigarette advertising, brands, promotional products, and American movies	3-level smoking behavior: (1) never smokers' smoking intentions in next year (definitely not, probably not, probably yes, or definitely yes); (2) exploratory puffing; and (3) current smoking (in last 7 days)	All levels of smoking behavior (including intention) were significantly higher for those who recalled cigarette advertising.
Goldstein et al. 1987[131]	306 students in 9th through 12th grades in the United States	Cigarette advertising recognition of missing brands and missing slogans	4-level status: (1) nonsmoker—never experimented or tried; (2) experimenter—tried but smokes less than 1 cigarette/week; (3) light smoker—1 cigarette to 1 pack/week; and (4) regular smoker—1 pack or more/week	A positive relationship was found between smoking level and cigarette advertising recognition.
Gunther et al. 2006[132]	818 6th graders in 2 WI middle schools	Scale combining perception of peer exposure and tobacco attention to protobacco and antitobacco advertising in the past 30 days	4-level status: (1) nonsusceptible never smoker; (2) susceptible never smoker; (3) experimenter; and (4) established smoker	Path analysis indicated that both protobacco and antitobacco media may have a significant indirect effect on adolescent smoking through their effects on peer norms. Peer norms and other social influences were included in the model. The positive effect for protobacco advertising was greater than the negative effect for antitobacco advertising.

Note. IV = independent variable; DV = dependent variable.

Table 7.3 Cross-Sectional Studies of the Association of Tobacco Marketing with Adolescent Smoking *(continued)*

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Hawkins and Hane 2000[133]	843 middle/junior high-school-age students from a large midwestern metropolitan area	Ratings of opinions about what cigarette advertising conveyed (e.g., "Cigarette advertisements make it look like smoking cigarettes will help you to get a girl/ boyfriend." This was labeled as recall, but the authors of this chapter define it as a measure of opinions about advertising. Also assessed beliefs about smoking/smokers.	3-level status: (1) never tried, (2) tried, and (3) occasional and regular smokers	Smoking status was not associated with respondents' opinions about the content of print cigarette advertisements. However, those who smoke at least occasionally were more likely to rate smoking as having a variety of positive benefits.
Henriksen et al. 2004[134]	2,125 middle-school students in Tracy (a midsized town in central CA); surveys completed in spring 2003	Exposure to tobacco marketing in stores (based on students' report of visits to convenience, liquor, or small grocery stores), owning a promotional item, seeing tobacco advertisements in magazines, or seeing someone smoke on television/ film in past week	Ever smoking (even a puff)	Weekly exposure to retail tobacco marketing was associated with a 50% increase in the odds of ever smoking, even when controlling for parent and peer smoking. Retail marketing exposure was second only to owning a cigarette promotional item in increasing the odds of ever smoking. These results held, even when social influences on smoking were controlled.
Kaufman et al. 2002[135]	A nationally representative sample of 17,287 13- to 19-year-old students, conducted in 1996	Receptivity to advertising (no favorite advertisement and does not own a cigarette promotional item; has favorite advertisement only, owns/would use a cigarette promotional item only, and has a favorite advertisement and owns/would use cigarette promotional item)	4-level status: (1) never smoker, not susceptible; (2) never smoker, susceptible; (3) experimenter; and (4) regular smoker. Susceptibility was based on answers to 3 questions: If one of your best friends were to offer you a cigarette, would you smoke it? At any time during the next year do you think you will smoke a cigarette? Do you think you will ever smoke a cigarette in the future?	All levels of receptivity to advertising were significantly associated with being a susceptible never smoker and with being an experimenter (ever tried or experimented, even a few puffs) or a regular smoker. These analyses controlled for social influences. Being an experimenter was not significantly associated with owning an item, and being a regular smoker was not associated with having a favorite advertisement.

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Klitzner et al. 1991[136]	295 subjects in 3 grade groups: 5th to 6th (35%); 7th to 9th (35%); and 10th to 12th (31%) in 3 separate school districts in an east coast urban/suburban area of the United States	Samples of advertisements (with brand information removed) from 42 magazines and 2 newspapers for measuring (1) recall (proportion of cigarette, perfume, or alcohol advertisements previously seen by students), (2) proportion of cigarette advertisements for which product was recognized, and (3) proportion of advertisements for which the brand was recognized	Ever smoking	Ever smoking was associated with cigarette product recognition. Further, those who recalled more advertisements were more likely to be smokers.
Lam et al. 1998[108]	6,304 students aged 12–15 years from 61 randomly selected secondary schools in Hong Kong	Self-reported exposure to various cigarette-marketing stimuli; attitude toward cigarette advertisements as attractive (liking)	5-level status: (1) never smoked; (2) tried; (3) used to smoke but not now; (4) sometimes, but less than once/week; and (5) 6+ cigarettes/week	Exposure and liking for advertisements were associated with current smoking (even less than once per week), even when controlling for parent and peer influences.
Ledwith 1984[137]	Two representative surveys, each with 880 students from secondary schools in Greater Manchester, UK. The first survey included 5 secondary schools; the second survey included only 3 of the original 5 schools but surveyed 880 students from the same number of classes selected at random	Self-reported exposure to snooker championships on British television, the first sponsored by Benson & Hedges and the second sponsored by Embassy brand	Knowledge of sport sponsorship. Naming of cigarette brands. Children also listed the amount of their viewing time of recent snooker championship on British television	At the time of the first survey, Benson & Hedges sponsored the snooker championship. The majority of children surveyed had watched the coverage. The cigarette brands best known to the children and most associated by them with sports were the ones most heavily promoted by television sponsorship, including brands other than Benson & Hedges. The second study took place 2 months later, right after the British television showing of the Embassy brand's sponsorship of snooker on television. It found an increase in adolescents' knowledge of that brand and the brand's association with sports. The authors contend that sports sponsorship serves as cigarette advertising to children.

Note. IV = independent variable; DV = dependent variable.

Table 7.3 Cross-Sectional Studies of the Association of Tobacco Marketing with Adolescent Smoking *(continued)*

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Maassen et al. 2004[138]	282 students aged 14–18 years in school-based survey in Gambia	Whether have seen cigarette brand names on television, billboards, in newspapers or magazines, or at community events; ever offered a free cigarette by a tobacco company representative	4-level status: (1) never, (2) less than monthly, (3) monthly, and (4) weekly	A linear regression of the smoking status scale found an offer of a cigarette by a tobacco company to be the strongest associate with smoking level for any of the multitude of factors (including social influences) examined. With this variable in the model, none of the individual exposure variables was significant.
Maziak et al. 2003[109]	School-based surveys of 12- to 15-year-olds (3,934 in 1994–95 and 4,028 in 1999–2000) in Muenster, Germany	Tobacco advertising awareness (can you name a cigarette or tobacco brand?) and appreciation (do you think that cigarette advertisements are well made?)	4-level smoking status: (1) never; (2) occasional; (3) daily ≤10 cigarettes/day; and (4) daily >10 cigarettes/day	In 1994–95, appreciation of advertising was significantly greater among those who were smokers (including occasional). Awareness of advertising was high, but authors did not report a relationship between awareness and smoking status. Appreciation was not measured in 1999–2000.
MacFadyen et al. 2001[139]	629 15- and 16-year-old students in northeast England	Awareness of and involvement with tobacco marketing (e.g., advertisements, coupons, point-of-sale advertisements, sponsorship, direct mail, brand extension, or merchandising)	3-level smoking status: (1) never, (2) trier, and (3) current (not defined)	Awareness of and involvement with tobacco marketing were both significantly associated with being a current smoker, even when controlling for social influences. Further, the higher the level of awareness and involvement with tobacco marketing, the higher was the smoking status level, indicating a dose-response relationship.
Meier 1991[140]	School-based surveys of 1,085 7th- and 11th-grade students in Middletown, NJ	Awareness of cigarette sponsorship of sporting events and opinion about whether cigarette advertising should be allowed	3-level status: (1) never smokers, (2) triers, and (3) smokers; attitudes toward smoking; Likert scale of 16 questionnaire items about attitudes toward smoking	There were significantly less negative attitudes toward smoking among those who thought cigarette advertising should be allowed. Greater awareness of sporting event sponsorship and agreement that advertising should be allowed were reported among smokers and triers than among nonsmokers (latter 2 associations not tested statistically).

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Mowery et al. 2004[141]	1999 (N = 15,056) and 2002 (N = 35,828) U.S. National Youth Tobacco Surveys. These school-based surveys interviewed students from 11 to 18 years old	Ownership or willingness to use a cigarette promotional item, analyzed as separate variables	Susceptibility to smoking among never smokers and any smoking among all respondents	For both outcomes, both ownership and willingness to use a cigarette promotional item were significant, after controlling for social influences to smoke.
O'Connell et al. 1981[111]	6,000 10- to 12-year-old primary schoolchildren in Hunter Health Region, New South Wales, Australia	Attitude toward tobacco advertising	4-level status: (1) never, (2) triers, (3) recent, and (4) regular	In order of strength of association, smoking (both recent and regular) was positively associated with friends' smoking, approval of advertising, siblings' smoking, money to spend per week, gender, age, and parents' smoking.
Otake and Shimai 2002[142]	409 7th graders and 348 8th graders in an urban area of Japan	Attitude (liking) toward advertising	Stages of smoking acquisition (precontemplation, contemplation, preparation, and action) based on 4 smoking questions: (1) interested in smoking? (2) think you might smoke in future? (3) smoked in past year? and (4) smoked in past month? Not specified how questions were used to classify students into stages.	Liking for cigarette advertising increased from the precontemplation to the action stage. Social influences and access to cigarettes were controlled.
Peters et al. 1995[143]	Primary school students (8–13 years) in Hong Kong	Being able to give a brand name for logos presented in a survey instrument. Cigarette and other product logos were presented.	Ever smoked	Ever smokers were significantly more successful at providing brand names for the cigarette logos than were never smokers.
Pinilla et al. 2002[144]	1,877 students from 30 secondary schools on the Island of Gran Canaria, Spain	Attitudes toward cigarette advertising and awareness of cigarette prices	4-level smoking status: (1) never; (2) less than once/week; (3) weekends only; and (4) daily	Attitudes toward cigarette advertising were not significantly related to smoking status.

Note. IV = independent variable; DV = dependent variable.

Table 7.3 Cross-Sectional Studies of the Association of Tobacco Marketing with Adolescent Smoking *(continued)*

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Potts et al. 1986[145]	258 5th-form pupils (aged 15–16; 137 boys, 121 girls) in city of Nottingham, UK	Attitude—opinions of cigarette advertisements as exciting, interesting, eye-catching, glamorous, or witty	5-level status: (1) never, (2) tried once, (3) used to smoke, (4) infrequent smoker/less than once/week, and (5) regular smoker/more than once/week)	Significantly more regular smokers than nonsmokers rated advertising as exciting, interesting, and eye-catching.
Sargent et al. 2000[146]	1,265 6th- to 12th-grade students in NH and VT public schools	Receptivity—ownership of cigarette promotional items, specification of favorite brand	5-level smoking uptake continuum: (1) nonsusceptible never smoker, (2) susceptible never smoker, (3) nonsusceptible experimenter, (4) susceptible experimenter, and (5) smoker—≥100 cigarettes in lifetime	Being a smoker or being further along the smoking uptake continuum was more likely if a participant owned a cigarette promotional item, even when controlling for social influences to smoke. The more cigarette promotional items owned, the further along the initiation continuum the students were.
Schooler et al. 1996[46]	571 ethnically diverse 7th graders in San Jose, CA	Self-reported exposure to cigarette advertisements in magazines, on billboards, in stores, or at sports or community events, and of receiving advertisements or promotions through the mail; also ownership of promotional items	Any experimenting with smoking	Even when controlling for social influences to smoke, experimentation was significantly greater for those with more exposure to magazine advertisements or in-store advertisements, receipt of mailings from a cigarette company, or ownership of promotional items.
Sin 1997[147]	588 11- to 16-year-old students (grades 7 through 9) in 4 secondary schools in Hong Kong	Levels of exposure to printed media and attitude toward cigarette advertising	2-level status: (1) smokers—at least 1 cigarette/day and (2) nonsmokers—never smokers or <1 cigarette/day	Although smokers and nonsmokers had the same level of exposure to media, in each case smokers had more favorable evaluations of the cigarette advertisements than did nonsmokers. Attitude toward cigarette advertisements was significantly related to smoking status, even when controlling for friend and family smoking.

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Smith and Stutts 1999[148]	246 junior/middle school, high school, and college students in a medium-sized metropolitan area in the southwest U.S.	Exposure to cigarette advertisements, attention paid to cigarette advertisements, and familiarity with cigarette characters and brand names	Smoking level: regular smokers vs. at-risk smokers (experimenters and social smokers)	The hypothesis that adolescents who smoke are more likely to have been exposed to cigarette advertisements was not supported for any grade level nor for all students combined. However, for junior high/middle school students and for all students combined, those who smoke (regular and at-risk) were more likely than were nonsmokers to pay attention to cigarette advertisements. Regular smokers were significantly more familiar than were nonsmokers with cigarette characters and brands.
Sovinova and Csemy 2004[149]	4,149 7th–9th graders in Czech Republic participating schools	Exposure to protobacco messages in newspapers and magazines, possession of a cigarette promotional item, and offer of a cigarette by a tobacco company representative	Never vs. current (in past 30 days)	No difference shown between never and current smokers' exposure to protobacco messages (~80%). Significantly more current smokers owned a tobacco promotional item and had been offered a cigarette by a tobacco company representative compared with never smokers.
Straub et al. 2003[150]	1,229 nonsmoking 9th graders at 7 public schools in the San Francisco Bay Area, CA	Exposure to, recognition of, and receptivity and attitudes toward tobacco advertising	Intention to smoke	Brand recognition/favorite tobacco advertisements and willingness to wear or use tobacco-branded products were found to be associated with intention to smoke. These associations remained significant in a multivariate analysis that included social influences. Self-reported exposure to advertisements was not related to intention when other measures of exposure to advertising (e.g., receptivity) were included in the model.
Sun et al. 1998[112]	100 public junior high school students (48 females and 52 males) in Sunset Park, Brooklyn, NY	Beliefs about cigarette advertising	3-level smoking status: (1) never smokers, (2) former smokers, and (3) current smokers; classified both former and current smokers as smokers	Most smokers (8 of 12) preferred a brand that advertised heavily near the school. Twenty-seven percent believed the advertisements influenced them, and 66% supported banning cigarette advertisements. Beliefs about whether advertising influenced them to smoke did not differ between smokers and nonsmokers.

Note. IV = independent variable; DV = dependent variable.

Table 7.3 Cross-Sectional Studies of the Association of Tobacco Marketing with Adolescent Smoking *(continued)*

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Tercyak et al. 2002[76]	1,123 high school freshmen from 5 public schools in northern VA	Receptivity to tobacco advertising	2-level status: (1) never, even a few puffs; and (2) ever, at least a partial or whole cigarette; within ever, current smokers defined as any smoking in last 30 days	Exposure to other smokers, high receptivity to tobacco advertisements, and clinically significant depressive symptoms were independently associated with ever smoking. Adolescents with high levels of depressive symptoms and high receptivity to tobacco advertisements were more likely to smoke currently than were their counterparts without elevated symptoms.
Unger and Chen 1999[151]	10,030 adolescents contacted via random-digit dialing in the California Tobacco Survey	Receptivity to protobacco media: having a favorite advertisement, having received a promotional item, and willingness to use promotional items	Self-reported age at which respondent smoked first cigarette	Younger age of smoking initiation was associated with all three measures of receptivity, even when sibling, parent, and friend smoking were controlled.
Unger et al. 1995[94]	386 8th graders (54% female; 46% male) in Southern CA (never smokers)	Advertisement rating and liking: recognition of tobacco and alcohol brands, liking of these advertisements; liking of advertising, assessed with 3-point-scale answer to "How much do you like the advertisement (not the product)?" and a 4-point-scale answer to "Does this advertisement make you want to buy and try this product?"	3-level status: (1) nonsusceptible nonusers—have never used and do not intend to do so, (2) susceptible nonusers—have not used but have not made a firm commitment not to experiment in the future, and (3) users—have tried the substance	Smoking susceptibility was a significant correlate of brand recognition across all cigarette brands. Susceptible nonsmokers liked the tobacco advertisements at a significantly greater level than did nonsusceptible nonsmokers and at a level comparable to that of smokers. Smoking susceptibility was significantly associated with liking for Marlboro cigarette advertising.

Study	Setting/sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Unger et al. 2001[114]	5,870 8th graders contacted via random-digit dialing in the California Tobacco Survey	Factor analysis of exposure measures identified 4 factors: perceived pervasiveness of both protobacco and antitobacco marketing, recognition of specific antitobacco marketing, and receptivity to protobacco marketing.	4-level status: (1) never, (2) susceptible—might accept from friend or try in next year, (3) experimenter, and (4) established smokers—100 or more cigarettes in lifetime	Factor analysis of measures of protobacco and antitobacco media identified two factors involving protobacco media: perceived pervasiveness of protobacco marketing and receptivity to cigarette marketing. Higher levels of receptivity were associated with higher levels of smoking. Perceived pervasiveness of protobacco marketing was significantly higher among established smokers than among susceptibles, and the susceptibles were significantly lower in this measure than never smokers, experimenters, and established smokers.
Wakefield et al. 2002[107]	3,890 U.S. high school smokers, matched to 196 convenience stores that they frequented	Estimated exposure to advertising: brand-specific advertising and promotions in convenience stores for Marlboro and Camel cigarettes; examined share of voice in stores	Choice of usual brand among high school student smokers	The choice of Marlboro cigarettes was associated with the presence of a gift with the purchase and greater brand share of interior and exterior advertising voice. The choice of Camel cigarettes was associated with a greater share of interior advertisement voice but unrelated to a gift with purchase and negatively associated with a greater share of exterior advertising voice.

Note. IV = independent variable; DV = dependent variable.

positive study, Schooler and colleagues[46] obtained data from an ethnically diverse sample of 571 7th-grade students in San Jose, California. Participants rated how often they saw advertisements in magazines, on billboards, in stores, or at sporting or community events. They also reported whether they had received mailings from cigarette companies and whether they owned cigarette promotional items. Even when controlling for social influences to smoke, experimentation with cigarettes was significantly greater for those with more exposure to magazine or in-store advertisements, receipt of mailings from a cigarette company, or ownership of cigarette promotional items.

In addition to the study by Schooler and colleagues,[46] 10 other studies of this type controlled for social influences to smoke. Like that study, they found that exposure to cigarette advertising was associated with smoking even when the influence of peers and/or family members on smoking was controlled statistically.[91,108,116,118,119,121,122,132,134,139] Gunther and colleagues[132] tested the hypothesis that advertising will influence many people regarding what is fashionable or attractive and that, as a result, people may adopt these new fashions themselves. In a sample of 818 6th and 8th graders in two Wisconsin middle schools, these researchers used a path analysis and showed that both protobacco and antitobacco advertisements had a significant indirect effect on adolescent smoking through their effects on peer norms.

Five papers reported finding no significant relationship.[138,147–150] No paper reported a negative relationship. One did not perform a statistical test, although the trend was for a positive relationship.[140] One "negative" study of 282 adolescents aged 14–18 years included a four-level smoking status measure as the dependent variable in a linear regression analysis. The study involved a total of 72 independent variables (7 regarding social influences) and found that none of the exposure variables (television, billboard, newspapers and magazines, community events) was related to smoking level.[138] However, the variable—an offer of a cigarette by a tobacco industry representative—was the most related to smoking level. The invasiveness of this marketing practice may have eclipsed the exposure variables. This study should have employed extensive data reduction and chosen a more appropriate analytic method.

Identifying a Dose-Response Relationship between Marketing Exposure and Youth Smoking

One of the studies profiled here[a] examined young people's awareness of, and involvement in, all existing forms of tobacco marketing communications. The investigators conducted regression analyses to examine whether any association existed between these measures and smoking status. Young people were very aware of all forms of tobacco marketing communications; more than one-half of all of the smokers studied had participated in some form of promotion. The first regression analysis showed that some individual marketing communication techniques (coupon loyalty offers and brand stretching) were associated with being a smoker. Perhaps more important, from an integrated marketing communications perspective, a second analysis found that the greater the number of tobacco marketing techniques a young person was aware of, the more likely he or she was to be a smoker. In other words, the investigators identified a dose-response relationship for marketing communications exposure and smoking behavior.

[a]MacFadyen, L., G. Hastings, and A. M. MacKintosh. 2001. Cross sectional study of young people's awareness of and involvement with tobacco marketing. *British Medical Journal* 322 (7285):513–17.

Bivariate analyses from a study from the Czech Republic[149] indicated that both current smokers and never smokers had similar high levels of exposure to protobacco messages in magazines and newspapers. However, smokers were significantly more likely to possess a cigarette promotional item and to have been offered a cigarette by a tobacco company representative. Another study that included multiple exposure measures did not find recall significantly related to smoking, but found other measures (e.g., attitudes and receptivity) to be significant.[150] Smith and Stutts[148] found exposure to cigarette advertisements unrelated to smoking, but smokers were more likely to pay attention to the advertisements and were more familiar with cigarette characters and brand names. Finally, a study of Hong Kong students also showed no difference in smoking behavior for those exposed and not exposed to cigarette advertising, but found that smokers viewed the advertisements more favorably than did nonsmokers.[147]

Recognition of Brands or Products

During the review period, 12 studies assessed how well adolescents could name the product or specific brand in an advertisement even when researchers had obscured the brand name from the advertisements.[91,92,94,115,116,118,120,125,128,131,136,143] Only one study[128] did not find that brand recognition was associated with smoking status, in a sample of 1,093 Turkish children aged 7–13 years.

As an example of a "positive" study, Unger and colleagues[94] had 386 8th-grade students from Southern California attempt to identify the brand advertised in six cigarette advertisements, five alcohol advertisements, and nine other product advertisements. The researchers found smoking status to be significantly related to cigarette brand recognition for the brands depicted (Marlboro, Kool, Newport, Virginia Slims, Camel, and Capri).

While 10 of the studies found a positive relationship between brand recognition and smoking or smoking susceptibility, only one of these controlled for social influences on smoking. This study[116] found that, among 11- to 14-year-old Scottish youth, smokers were better than nonsmokers at recognizing the brand of cigarette shown in advertisements that had identifying characteristics removed, when controlling for friend, sibling, and parent smoking.

Attitudes toward Advertising

In 15 studies, investigators assessed relationships between various smoking measures and adolescents' attitudes or opinions about cigarette advertising.[92–94,108,109,111,112,116,124,127,133,142,144,145,147]

Twelve of these studies found that attitudes toward advertising were significantly more positive among those who smoked or were susceptible to smoking. One "positive" study found a significant association when variables were assessed bivariately, but the relationship was not significant when a multivariate analysis controlled for social influences.[127] This study of 1,003 Spanish schoolchildren 11 to 13 years of age analyzed cross-sectional baseline data with a fairly weak attitudinal measure: "Do you believe that it is [all right] that there is tobacco advertising?"

Of the remaining "positive" studies, another five controlled for social influences.[108,111,116,142,147] Research by O'Connell and colleagues[111] provides an example of this type of study. These researchers obtained data from 6,000 Australian children, aged 10–12 years. They found that students' ratings (low/unfavorable to high/favorable) of their attitudes toward cigarette advertising were significantly higher among smokers compared with nonsmokers.

Three additional studies found no significant relationship between attitudes

toward cigarette advertisements and smoking.[112,133,144] No study reported a negative relationship. One study that did not find a relationship between attitudes toward cigarette advertising and smoking asked adolescents whether they believed that advertising influenced young people to smoke.[112] Results did not differ significantly by smoking status. This measure is conceptually distinct from measures of the degree to which adolescents like or find cigarette advertisements appealing. An adolescent who himself or herself does not find advertising appealing could still believe that it influences other adolescents to smoke.

Receptivity to Cigarette Marketing

Eighteen studies used indices of receptivity to cigarette marketing including owning or willingness to use cigarette promotional items.[13,46,65,76,113,114,117,123,124,126,129,134,135,139,141,146,150,151] Each of these studies found that receptivity to cigarette marketing was significantly related to smoking status or susceptibility. Four of these studies did not control for social influences to smoke.[114,117,124,129]

Evans and colleagues[13] assessed receptivity in a sample of 3,536 adolescents who had never smoked but who varied in their susceptibility to smoking. Results show that adolescents' susceptibility to smoking was significantly greater the more receptive they were to marketing. This relationship held even when researchers controlled for exposure to social influences to smoke.

The study by Tercyak and colleagues[76] is of particular interest. These researchers obtained data from 1,123 high school freshmen in Northern Virginia. In addition to assessing receptivity, they evaluated depression and found that exposure to other smokers, high receptivity to tobacco advertisements, and clinically significant depressive symptoms independently were associated with whether the students had ever smoked. These findings suggest that depressed adolescents may be especially vulnerable to cigarette advertising. Tercyak and colleagues found that adolescents experiencing high levels of depressive symptoms and who were high in receptivity to tobacco advertisements were more likely to smoke cigarettes than were those who were receptive but not depressed.

A study by Sargent and colleagues[146] of 1,265 students (grades 6 through 12) in New Hampshire and Vermont assessed only whether they owned a cigarette promotional item. One of every three students did. Investigators found a dose-response relationship between the number of promotional items owned and both being a smoker and being further along the continuum of the smoking initiation process.

Longitudinal Studies

Table 7.4 presents summary information about 16 longitudinal studies* of the relationship between various measures of exposure to cigarette marketing and adolescents' smoking or susceptibility to smoking. With relatively large samples of subjects in four countries (and three U.S. states), researchers found that receptivity to, exposure to, or awareness of tobacco advertising significantly predicted smoking at follow-up. After controlling for other variables including social influences, a significant link was present in all but two studies.[127,152] In these two studies, the link just missed statistical significance at the $p < .05$ level. Because of the importance of

*Twelve of the studies published before 2003 were reviewed previously in Lovato, C., G. Linn, L. F. Stead, and A. Best. 2003. Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours. *Cochrane Database of Systematic Reviews* (3):CD003439.

Table 7.4 Longitudinal Studies Predicting Later Smoking Behavior from Measures of Exposure to Tobacco Marketing at Baseline

Document	Setting/ sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Aitken et al. 1991[110]	Glasgow, Scotland, in-home interviews of 640 children initially between 11 and 14 years old. They were reassessed about 1 year later. Few had smoking experience.	Recall of advertising for specific brands of cigarettes, recognition of brands in advertisements with brand information removed, appreciation of cigarette advertisements (ratings of liking for cigarette advertisements in general, recall of liked advertisements, and opinion about banning cigarette advertisements)	Intentions to smoke ("Do you think you will smoke cigarettes when you are older?") asked of all respondents, including those with smoking experience	The number of cigarette advertisements correctly identified significantly predicted the development of more positive intentions to smoke 1 year later, even when friends, parents, and sibling influences were controlled. Children with less appreciation of cigarette advertisements were significantly more likely to become more negative in their intention to smoke, even when friends, parents, and sibling influences were controlled.
Alexander et al. 1983[153]	5,686 10- to 12-year-old Australian children assessed at 2 points, 12 months apart	Approval of cigarette advertising	4-level status: (1) adopters—did not smoke at first survey, but did at second, (2) nonsmokers at both surveys, (3) quitters—smoked at first but not second survey, and (4) smoked at both surveys	Approval of cigarette advertising predicted smoking status (adopters and smoker at both times) 1 year later, even when friends' and siblings' smoking was controlled.
Armstrong et al. 1990[154]	Australia, 2,366 year 7 students (modal age 12 years); reassessed 1 and 2 years later	Perceived influence of cigarette advertising on the student	Initiation of smoking (ever smoked) 1 or 2 years later	Children who were initially nonsmokers were more likely to have smoked 2 years later if they initially perceived that cigarette advertising influenced them. This was true even when parental, sibling, and friends' smoking was controlled.

Note. IV = independent variable; DV = dependent variable.

Table 7.4 Longitudinal Studies Predicting Later Smoking Behavior from Measures of Exposure to Tobacco Marketing at Baseline *(continued)*

Document	Setting/ sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Biener and Siegel 2000[155]	Massachusetts Tobacco Survey (1993). 1997–98 follow-up on 529 adolescents, who were 12 to 15 years old and nonsmokers (never or experimenter) in 1993	Receptivity to tobacco marketing: (1) owned a promotional item and (2) could name a brand of cigarettes whose advertisements attracted them	Whether or not had become an established smoker (had smoked 100 or more cigarettes) at 4-year follow-up	Adolescents who owned a tobacco promotional item and named a brand whose advertisements attracted them were more than twice as likely to be established smokers 4 years later. This was true even when prior experimentation, rebelliousness, and smoking by adults and friends were controlled.
Charlton and Blair 1989[156]	29 secondary schools in Northern England; 1,390 self-identified never smokers aged 12–13 years; assessed twice, 4 months apart	Cigarette brand awareness, favorite advertisements for cigarettes, viewing of cigarette brand–sponsored sports on television	3-level status: (1) never smoker, (2) sometime smoker, and (3) regular smoker	For girls, awareness of at least one cigarette brand significantly predicted the uptake of smoking (sometimes or regularly) even when smoking by parents and friends was controlled. There were no significant findings for boys.
Choi et al. 2002[157]	Baseline data derived from the California Tobacco Survey, 1993; follow-up in 1996; 965 adolescents classified as experimenters (had smoked, but fewer than 100 cigarettes) at baseline	Receptivity to advertising (having a favorite tobacco advertisement, and being willing to use a promotional item)	Established smoking by 1996 (smoked 100 or more cigarettes in lifetime)	Receptivity to tobacco advertising and promotions was a significant predictor of established smoking. Those who were highly receptive to tobacco marketing were 70% more likely to become established smokers at follow-up compared with those who were minimally receptive. This was true even when relationships with family members and family and friends who smoked were controlled.

Document	Setting/ sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Diaz et al. 1998[127]	1,003 Spanish schoolchildren (aged 11 to 13 years)	Were asked: "Do you believe that it is [all right] that there is tobacco advertising?"	Never vs. any smoking at follow-up	Never smokers at baseline (n = 906) were followed up 1 year later, and agreement with the statement about tobacco advertising was marginally predictive of any smoking at follow-up.
Gilpin et al. 2007[158]	2 cohorts of young adolescents (12–15 years) followed up 6 years later (1993–99, n = 1,734 and 1996–2002, n = 1,983); baseline cohorts identified from 1993 and 1996 California Tobacco Surveys	Receptivity to tobacco advertising and promotions: high—own or would be willing to use a tobacco promotional item and moderate—have a favorite cigarette advertisement	Being a current established smoker as a young adult 6 years later	Despite lower rates of current established smoking in the second cohort, the effects of high and moderate receptivity on the outcome variable were similar and significant in both cohorts after controlling for social influences to smoke.
Lopez et al. 2004[159]	Spanish students (13 and 14 years) participating in 3-country study (N = 2,356) in Spain completing 18-month follow-up	Awareness at baseline of 3 advertisements (with brand identification removed) that were exhibited near participating schools	New and at least weekly smoker at follow-up	Awareness level (provided brand for none, 1, 2, or 3 advertisements) predicted new weekly smokers at follow-up, after controlling for social influences to smoke.
Pierce et al. 1998[160]	Population-based, random-digit-dialed telephone survey in CA; 1,752 adolescent never smokers who were not susceptible to smoking in 1993 reinterviewed in 1996	Exposure to tobacco promotions and advertising	Progression to smoking: becoming susceptible to smoking (do not rule out trying a cigarette or accepting one if offered by a friend) or any experimenting by 1996	Having a favorite advertisement in 1993 predicted which nonsusceptible never smokers would progress by 1996, even when controlling for family and peer smoking. Possession of or willingness to use a tobacco promotional item was even more strongly associated with future progression, even when family and peer smoking was controlled.

Note. IV = independent variable; DV = dependent variable.

Table 7.4 Longitudinal Studies Predicting Later Smoking Behavior from Measures of Exposure to Tobacco Marketing at Baseline *(continued)*

Document	Setting/ sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Pierce et al. 2002[161]	Population-based, random-digit-dialed telephone survey in CA; sample of 1,641 adolescent never smokers aged 12–14 years in 1996 who had never smoked and were assessed again in 1999. Analysis in this paper focused on 894 adolescents whose parents were classed as authoritative.	Receptivity to tobacco advertising and promotions	Any smoking by follow-up	Among adolescents whose parents were authoritative (an index of parents' positive responsiveness and monitoring), high receptivity predicted smoking onset even when family and peer smoking was controlled.
Pierce et al. 2005[152]	2,119 12- to 15-year-old never smokers from 1996 California Tobacco Survey followed 3 years later	Advertising receptivity, curiosity about smoking, and susceptibility to smoking	Any smoking by follow-up in full sample, and susceptibility or any smoking among nonsusceptible never smokers	For the full sample, both curiosity about smoking and being susceptible to smoking predicted smoking by follow-up. High receptivity was of marginal significance. In the nonsusceptible never smokers, only curiosity predicted progression toward smoking. A further cross-sectional analysis showed receptivity and friends who smoked to be related to curiosity (dependent variable), suggesting that these factors may induce curiosity. All analyses controlled for social influences to smoke.
Pucci and Siegel 1999[162]	627 12- to 15-year-old never smokers in MA	External measure of brand-specific exposure to cigarette advertising in magazines the youth read	Brand first smoked by new ever smokers at follow-up, brand smoked by current smokers at follow-up, and brand whose advertisements attracted attention the most.	Brand of exposure in magazines at baseline was significantly correlated with brand of initiation 4 years later, brand smoked by current smokers at follow-up, and naming of the brand that attracted attention the most at follow-up.

Document	Setting/ sample size	Measure of advertisement exposure (IV)	Outcome measures (DV)	Findings
Sargent et al. 2000[163]	480 4th- to 11th-grade students in 3 rural VT kindergarten–12th-grade schools, surveyed at baseline, 12 months, and 21 months	Receptivity to cigarette promotions measured by ownership or willingness to use a cigarette promotional item	6-level uptake process: (1) never smoker/not susceptible, (2) never smoker/susceptible, (3) puffer, (4) noncurrent experimenter, (5) current experimenter, and (6) smoker/≥100 cigarettes in lifetime	Receptivity significantly predicted progression along the smoking initiation process 21 months later even when controlling for family and peer smoking. Increases in receptivity to cigarette promotions between the first and second or second and third assessments also significantly predicted progression to smoking (higher status level).
Weiss et al. 2006[164]	2,822 of 4,427 California 6th graders who completed 3 waves (6th, 7th, 8th grade) of school survey; main analysis confined to 2,026 nonsusceptible never smokers at baseline	Self-reported exposure to smoking on TV or to point-of-sale tobacco advertising; self-reported exposure to anti-tobacco media advertising on television.	Reporting susceptibility to smoking and/or ever smoking (progression) at either follow-up (7th or 8th grade)	Report of exposure to either or both protobacco settings was significantly related to progression by follow-up. Report of exposure to antitobacco media was significantly protective of future progression. Analyses were adjusted for demographics and whether or not the school had an antitobacco program but not for social influence variables.
While et al. 1996[165]	1,450 English 11- and 12-year-olds assessed twice, 1 year apart	Awareness of brands and having a favorite cigarette advertisement	Smoking status (precise measure not reported)	Girls who named Benson & Hedges as a brand they were aware of were significantly more likely to be smoking 1 year later. The same was true for girls who named Benson & Hedges and Silk Cut (the two most advertised cigarette brands). No effects were found for boys.

Note. IV = independent variable; DV = dependent variable.

this methodological approach, each of these studies is described in detail below.

Alexander and colleagues[153] assessed 5,686 Australian schoolchildren, aged 10–12 years, at two occasions over 12 months (the follow-up rates were not reported). In the first assessment, students rated their approval of cigarette advertising. A multiple regression analysis indicated that those who approved of cigarette advertising were significantly more likely to report smoking at the second assessment. The analysis took account of smoking by friends and siblings, which also were significant predictors of later smoking.

Aitken and colleagues[110] obtained data from 640 11- to 14-year-olds in Glasgow, Scotland (75% of original sample). Their measures of exposure included recall of advertising for specific brands of cigarettes, recognition of brands in advertisements with brand information removed, and ratings of appreciation of cigarette advertisements (ratings of liking for cigarette advertisements in general, recall of liked advertisements, and opinion about banning cigarette advertisements). They found that the number of cigarette advertisements correctly identified significantly predicted the development of more-positive intentions to smoke one year later, even when controlling for friend, parent, and sibling influences. Children with less appreciation of cigarette advertisements were significantly more likely to become more negative in their intention to smoke, even when friend, parent, and sibling influences were controlled.

Armstrong and colleagues[154] measured the perceived responses to cigarette advertising in a large sample (2,366) of 7th-grade students in Australia participating in an experimental evaluation of a smoking prevention curriculum. At baseline, students provided information about their own, their families', and their friends' smoking status, and their knowledge of and attitudes toward smoking. They also answered the question, "How much do cigarette advertisements make you think you would like to smoke a cigarette?" There were two follow-up assessments, one and two years after the end of the intervention, with a successful reassessment of 64% at two years. For girls, the researchers found consistent evidence of smoking initiation both one and two years later among students who said cigarette advertising had some influence. For boys, the relationship was significant only at the two-year follow-up. All of the analyses controlled for family and peer smoking.

Six studies used data from statewide tobacco surveys in Massachusetts (two) and California (four).[152,155,157,158,160,162] All but one study[152] found that adolescents in Massachusetts and California who responded positively to cigarette promotional items or tobacco advertisements were more likely to progress toward smoking three to four years after baseline. The California studies were the only longitudinal studies that weighted the data to be representative of the population and to account for attrition by follow-up.

In one Massachusetts study, Biener and Siegel[155] reinterviewed 529 adolescents (58%) four years after baseline regarding their smoking status. Adolescents who owned a cigarette promotional item and who could name a cigarette brand whose advertisements they liked were twice as likely as those who did neither to become smokers. The analysis controlled for prior experimentation, rebelliousness, and adult and friend smoking. Thus, the influence of exposure to advertisements and cigarette promotional items was over and above any influences of these factors.

In another Massachusetts study of the same data set, Pucci and Siegel[162] examined adolescent exposure (external measure) to brand-specific advertising and its

relationship to smoking four years later. The first assessment obtained data on the magazines each youth read. The authors created an estimate of each student's exposure to advertising for each cigarette brand on the basis of the number of pages of cigarette advertising for those brands in the magazines the youth reported reading that year. The investigators also estimated the share of advertising reaching these youth that each brand achieved by totaling the number of pages of advertising for each brand in the magazines the students read and dividing that by the total number of pages for all brands. The top five brands on this measure of share of advertising were (in order) Marlboro, Camel, Kool, Newport, and Winston. They accounted for 81.8% of all cigarette advertising in these magazines. Brand-specific exposure to advertising among these youths was highly related to each brand of initiation among new smokers four years later (r = .93). Moreover, this exposure measure predicted the brand smoked by current smokers in the follow-up assessment (r = .86), as well as the brand whose advertisements attracted the most attention at follow-up (r = .87).

Using California data, Pierce and colleagues[160] reported on the 1996 follow-up of 1,752 adolescents 12–17 years of age who were nonsusceptible never smokers in 1993 (62% of original sample). They found that having a favorite advertisement in 1993 predicted which adolescents would progress toward smoking by 1996. Possession of or willingness to use cigarette promotional items was even more strongly associated with future progression toward smoking

Other Models of the Influence of Tobacco Advertising

The psychological needs of adolescents and their related need to project a desired image have received the most attention from researchers regarding how tobacco marketing works to influence adolescents to smoke. However, at least three other mechanisms have been suggested and investigated on a more limited basis:

- One proposes that a positive stereotype depicted in cigarette advertising may lead adolescents to seek favorable evidence about smokers and come to believe that they have desirable traits.[a] In turn, they become more inclined to smoke cigarettes themselves.
- Another suggests that adolescents perceive that tobacco advertising influences their peers to engage in an accepted or "in" behavior. To not be left out, they adopt smoking to be part of the crowd.[b]
- Finally, another line of research based on advertising theory suggests that advertising helps to create curiosity about smoking. If adolescents perceive that trying a cigarette is low cost (offered free by a peer) and low risk (just one is okay), they may act to satisfy their curiosity.[c]

It is likely that most of these mechanisms operate to a greater or lesser extent in a given individual.

[a]Pechmann, C., and S. J. Knight. 2002. An experimental investigation of the joint effects of advertising and peers on adolescents' beliefs and intentions about cigarette consumption. *Journal of Consumer Research* 29 (1): 5–19.

[b]Gunther, A. C., D. Bolt, D. L. G. Borzekowski, J. L. Liebhart, and J. P. Dillar. 2006. Presumed influence on peer norms: How mass media indirectly affect adolescent smoking. *Journal of Communication* 56 (1): 52–68.

[c]Pierce, J. P., J. M. Distefan, R. M. Kaplan, and E. A. Gilpin. 2005. The role of curiosity in smoking initiation. *Addictive Behaviors* 30 (4): 685–96.

cigarettes. All analyses controlled for demographics, school performance, and peer and family smoking.

In another analysis of the 1993–96 California data, Choi and colleagues[157] conducted separate analyses for another 965 adolescents who at baseline were classified as experimenters (had smoked, but fewer than 100 cigarettes). Among the 32% of experimenters who had become established smokers by 1996, the highest rate of progression (52%) occurred among those who, in 1993, were willing to use a cigarette promotional item and believed they could quit anytime. The authors found that experimenters who were highly receptive to marketing were 70% more likely to become established smokers by follow-up than were those minimally receptive to the marketing. This was true even when family and friend smoking was controlled.

Pierce and colleagues[161] conducted another longitudinal study using data from a sample of adolescent never smokers aged 12–14 years identified from the 1996 California Tobacco Survey and recontacted in 1999. These researchers examined the level of authoritative behavior in parents and the students' receptivity to tobacco advertising and promotions. Authoritative parents were those whose children rated them as warmly responsive to the child and high in their level of parental monitoring. When 1,641 of the adolescents completed a follow-up survey in 1999 (68% of the original sample), the authors found significantly higher rates of smoking among adolescents who were receptive to advertising and who had more authoritative parents. Apparently, in families in which parents are authoritative but noninterfering with respect to their children's exposure to cigarette marketing, such marketing can influence smoking initiation.

Another analysis[152] of the above 1996–99 data set investigated the role of curiosity together with smoking susceptibility and advertising receptivity in never smokers aged 12–15 years (n = 2,119, or 67% successfully followed). The study also examined only the nonsusceptible never smokers (n = 970) and whether they became susceptible or smoked by follow-up. Advertising theory emphasizes the necessity for closing the knowledge gap about the benefits of a product to increase curiosity about the product.[166,167] Further, those curious about a product may seek to satisfy their curiosity if they perceive that it is low cost (free from a peer) and low risk (just one is okay).[168,169] In the analysis of all never smokers, both smoking susceptibility and curiosity were significantly related to any smoking by follow-up. However, high advertising receptivity just missed statistical significance, with an adjusted odds ratio (OR) of 1.88 (95% confidence interval [CI], 0.99–3.56). In the analysis of the nonsusceptible never smokers, curiosity predicted progression toward smoking but receptivity did not. A further cross-sectional analysis (1,451 nonsusceptible never smokers at baseline in 1996), with curiosity as the dependent variable, identified friends who smoke and advertising receptivity as significant correlates, again adjusting for other variables. The authors conclude that curiosity, perhaps stimulated by advertising, might be a critical precursor to smoking initiation.

In addition, a 2007 study by Gilpin and colleagues[158] further examined additional follow-ups in both of the cohorts reported on previously. The 1993–96 adolescent never smokers aged 12–15 years were again contacted in 1999 (n = 1,734, 47% of the original sample). In addition, similar adolescents from the 1996–99 cohort were contacted again in 2002 (n = 1,983, 48% of the original sample). High (own or would use a cigarette promotional item) and moderate (have a favorite cigarette advertisement) levels of advertising receptivity in the young adolescent never

smokers at baseline were significantly associated with being a current established smoker as a young adult to the same extent in both cohorts. This was true despite the lower percentage of current established smokers in the second cohort, reflecting California's decline in youth and adult smoking prevalence. Analyses were adjusted for demographics, school performance, smoking susceptibility, and family and peer smokers in the social environment.

Another study by Weiss and colleagues[164] of a California cohort of 6th graders successfully followed in both the 7th and 8th grades (n = 2,822 or 64% of the original sample) related reports among nonsusceptible never smokers at baseline (n = 2,026) of seeing smoking on television and/or seeing advertisements for tobacco in stores (point of sale) to reports of becoming susceptible to or actually smoking at either of the later follow-ups (7th or 8th grade). The study also examined reports of seeing antitobacco media advertising on TV. The protobacco media exposure was coded as exposure to neither, either, or both of the above protobacco messages. Exposure to one type predicted significantly greater progression toward smoking than exposure to neither, and exposure to both types predicted greater progression than exposure to just one type. The analyses were adjusted for demographics and whether the school had an antitobacco program, but not for social influence variables. Exposure to antitobacco media was protective of progression toward smoking.

A longitudinal study was conducted with the Spanish adolescents surveyed in the cross-sectional study by Diaz and colleagues[127] described above. Of never smokers at baseline, 906 were followed one year later (90% of the original sample). Agreement with the statement about the legitimacy of tobacco advertising was bivariately predictive of smoking at follow-up but only marginally significant in a multivariate analysis that controlled for opinions about smoking and social influences to smoke (adjusted OR of 1.6; 95% CI, 0.9–2.7).

Another Spanish study[159] analyzed advertising awareness at baseline among 2,356 adolescents, in 69 schools, aged 13 and 14 years who were successfully followed 18 months later (64%). Three billboard advertisements (selected according to specified criteria) that had appeared near each school were shown to the students with the brand identification removed. Participants could correctly identify zero, one, two, or all three brands. Awareness level was positively and significantly associated with being a new regular smoker (at least weekly) by follow-up. The authors adjusted for demographics and social influences.

Sargent and colleagues[163] studied 480 rural Vermont students in grades 4 through 11. They assessed receptivity to cigarette promotions in terms of ownership of or willingness to use a cigarette promotional item. The students (66% of the original sample) were contacted again 12 and 21 months later. Receptivity predicted progression toward smoking 21 months later, even when controlling for parent and peer smoking. Moreover, changes in receptivity between the first and second assessments or between the second and third assessments predicted progression to smoking even when controlling for initial receptivity. Thus, over time, the likelihood of smoking increased when an adolescent received or was willing to use a cigarette promotional item.

University of Manchester researchers[165] examined smoking onset among 1,450 students in England surveyed twice, one year apart (the follow-up response rate was not reported). The two most heavily advertised cigarette brands in that year were Silk Cut and Benson & Hedges. Girls who indicated awareness of either brand

were significantly more likely to be smoking one year later. The study found no effects for boys.

Another study with divergent results between genders was conducted in 29 secondary schools in Northern England.[156] In this study, 1,390 students (aged 12 and 13 years) self-identified as never smokers answered questions pertaining to nine variables. The students completed questionnaires twice, four months apart (the follow-up response rate was not reported), concerning cigarette brand awareness, favorite cigarette advertisements, and viewing of cigarette-sponsored sporting events. Awareness of cigarette brands (determined by answering the question, "Can you name a brand of cigarette?") was a significant predictor of smoking among girls, even when parent and friend smoking was controlled. However, there were no significant findings among boys.

There was a potential reduction in statistical power to identify a link between tobacco marketing activities and later smoking behavior because of sample attrition and the resulting potential bias toward a null finding. However, all of the longitudinal studies described above found at least a marginal link, even after adjusting for multiple other variables, including social influences to smoke cigarettes.

Effects of Tobacco Advertising on Tobacco Consumption

This section reviews another line of evidence from the empirical literature from econometric studies about the effects of tobacco advertising on tobacco consumption. Tobacco industry sources have claimed that tobacco advertising only affects market share among various competing brands rather than increasing total demand for tobacco. This section develops a framework for studying the relationship between advertising and tobacco consumption and reexamines prior studies of tobacco advertising in the context of this framework.

Chapters 4 and 6 in this monograph provide information as background for this chapter. Besides traditional media-based advertising to create a favorable product image, the tobacco industry uses additional marketing options to increase sales, including price discounts and promotional activities (e.g., specialty item distribution) that reduce the full price paid by consumers or by retailers.* As a result of the 1998 Master Settlement Agreement (MSA)—which bans tobacco advertising on billboards, in transit media, and in most other outdoor venues—the only remaining traditional media available to tobacco advertising are newspapers and magazines. However, a great deal of advertising and promotion now takes place at the point of purchase,[170] and it has more than doubled since the MSA (chapter 4). The MSA restrictions have not reduced the total amount of money the industry spends on advertising and promotions ($15.1 billion in 2003),[171] only the allocation. Most of the studies reviewed later in this section consider the time before the shift from advertising to promotional activities became well advanced, and for this reason, the expenditure measures were mostly for advertising.

Total advertising expenditures typically are analyzed as a percentage of sales, which is known as the advertising-to-sales ratio.† Schonfeld and Associates[172] reported that typical industry-level advertising-to-sales ratios average less than 3%. The advertising-to-sales ratio for cigarettes

*In this case, the full price can be defined as the monetary price minus the value of coupons or merchandise.

†The advertising-to-sales ratio does not include promotional expenditures.

Economics of Tobacco Advertising

Industries with a fairly limited number of producers (oligopolistic), such as the tobacco industry, often prefer competition through advertising rather than price to increase their share of the market.[a] Schmalensee showed that oligopolistic firms are likely to advertise more than similar firms in monopoly situations. Each firm is reluctant to use price competition if it believes that rivals also will cut their prices. If all firms cut prices, they all move down along an inelastic demand function similar to the industry demand function. Market share will not increase and revenue will decline. Advertising research usually finds that the firm with the largest share of voice (the firm's advertising as a percentage of total industry advertising) has the largest share of the market. Each firm attempts to advertise more than its rivals, which results in a high level of industry advertising. However, popular price promotions (e.g., two packs for the price of one, promotional sales with the price differential absorbed by the parent company rather than the retailer) are prevalent tactics that tobacco companies use.[b]

The high level of total advertising expenditures by the tobacco industry also is a function of the regulatory environment. Tobacco is an addictive substance with a high degree of brand loyalty. For such a product, in a period of increasing regulation, short-run sales maximization may be preferred to short-run profit maximization. Consumers lost now to a cheaper brand will not be likely to return. As a response to this, tobacco firms may take a multiperiod perspective on sales and profits. In a multiperiod framework, advertising and pricing decisions are guided by the goal of sales maximization, which is expected to maximize profit in the long run.

[a]Schmalensee, R. L. 1972. *On the economics of advertising.* Amsterdam: North Holland.

[b]Feighery, E. C., K. M. Ribisl, N. C. Schleicher, and P. I. Clark. 2004. Retailer participation in cigarette company incentive programs is related to increased levels of cigarette advertising and cheaper cigarette prices in stores. *Preventive Medicine* 38 (6): 876–84.

in 1980 was reported at 6.3%, although by 2000 this ratio was down to 2.9% (for later data, see chapter 4). However, the empirical studies of tobacco advertising reviewed below used historic data from the period when the ratio was relatively high.

Economic Issues in Tobacco Advertising

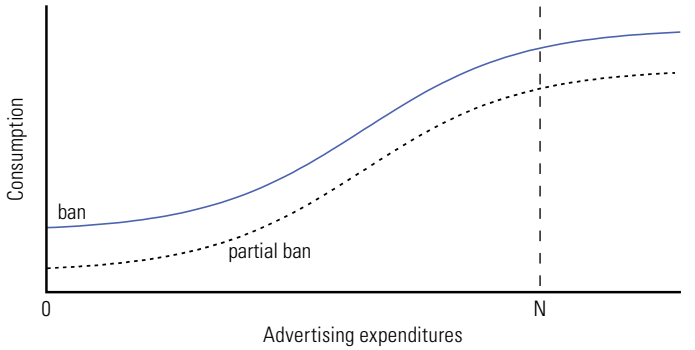
To interpret the findings of prior studies of tobacco advertising, it is important to understand how the extent of advertising is measured. In general, three methods of measuring advertising have been used:

1. National aggregate advertising expenditures from annual or quarterly time series
2. Local-level, cross-sectional advertising expenditure measures
3. Advertising bans

Examining the advertising response function can provide some insight into the consequences of these alternative methods of measuring advertising. An advertising response function describes the functional relationship between consumption and advertising. The advertising response function is nonlinear because of diminishing marginal effect. That is, while advertising increases consumption, increments of advertising yield ever smaller increments in consumption.* Ultimately, consumption is completely unresponsive to additional advertising, because all those who can be

*The literature on advertising response functions includes a variety of specifications. Some specifications also include a range of increasing marginal product.

Figure 7.1 Relationship between Levels of Advertising and Consumption Aggregated at the National Level



Note. N = point beyond which slope of function becomes near zero. A ban on certain media shifts the function downward.

Adapted from Saffer, H. 2000. Tobacco advertising and promotion. In *Tobacco control in developing countries,* ed. P. Jha and F. Chaloupka, 219. Oxford: Oxford Univ. Press. Reprinted with permission of Oxford University Press.

enticed to buy the product have already done so and they can consume only a certain amount.

Advertising response functions have been used for some time in brand-level research to illustrate the effect of advertising on consumption at various levels of advertising.[173–175] However, the same theory that describes the brand-level advertising response function also might be applied to aggregations of brands.[*] An aggregation of all brands in an industry can be defined as the industry-level response function. For the tobacco industry, the industry-level response function would include all brands and variations of cigarettes, cigars, and other tobacco products. If advertising resulted only in brand switching, the industry-level response function would be horizontal.[†]

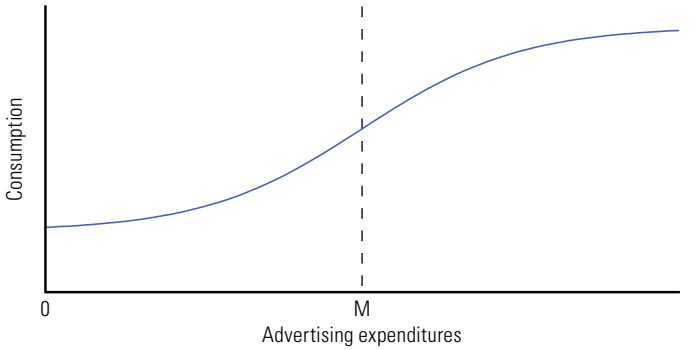
The assumption of a positively sloped industry-level response function provides a potential framework to analyze prior research. The prior research, in turn, either will validate or reject this assumption. The industry-level response functions are different from the brand-level response functions in that advertising-induced sales must come at the expense of sales of products from other industries or consumer savings.

An industry response function using national data and an industry response function using market-level data are defined. The reason for two response functions is that the likely outcome (the relationship between advertising and consumption) of measuring advertising at the national level could be different from measuring advertising at the market level (geographic area). Figure 7.1 illustrates the national-level response function. The vertical axis measures industry-level consumption at the national level, and the horizontal axis measures industry-level advertising expenditures at the national level. Figure 7.2 charts a market-level function. The vertical

[*]Specific media may be subject to diminishing marginal product, which would suggest that media diversification is necessary to maximize the effect of a given advertising budget.

[†]The theory of an industry response function also applies to counteradvertising, where the industry response function slopes downward and is subject to diminishing marginal product. Counteradvertising expenditures are relatively small, so a negative effect of these expenditures is likely to be observed in empirical studies.

Figure 7.2 Relationship between Levels of Advertising and Consumption Aggregated at the Market Level



Note. M = point around which changes in advertising expenditures produce observable changes in consumption.

Adapted from Saffer, H. 2000. Tobacco advertising and promotion. In *Tobacco control in developing countries,* ed. P. Jha and F. Chaloupka, 219. Oxford: Oxford Univ. Press. Reprinted with permission of Oxford University Press.

axis measures industry-level consumption at the market level, and the horizontal axis measures industry-level advertising expenditures at the market level.

Another important aspect of advertising is that its effects linger over time. That is, advertising in one period will have a lingering, although smaller effect, in the next period. Although the rate of decline over time remains an arguable issue, research such as that of Boyd and Seldon[176] indicates that cigarette advertising fully depreciates within a year. The lingering effect of advertising is the basis for a widely used advertising technique known as pulsing. A pulse is a burst of advertising, in a specific market, that lasts for a short time and then stops.* After a period with no (or minimal) advertising, the market will be exposed to another pulse. The length and intensity of a pulse will vary due to several factors, including the specific media, the specific advertisers, and the advertising costs in the specific market.

The response function represented in figure 7.1 helps to illustrate the likely outcome of measuring advertising at the national level. National advertising expenditures are the total of all tobacco advertising expenditures, for all advertisers, in all media, for all geographic market areas. This high level of aggregation reduces variation in the data. Since the advertising-to-sales ratio for tobacco was relatively large in the past, advertising may have been in a range of a very low or zero marginal effect. In figure 7.1, this situation is represented as measuring advertising in a range around N. The slope of the response function in the range around N is near zero.† That is, increases in advertising around N will not produce incremental cigarette sales (consumption). Studies that use this type of data would be expected to show no, or very little, effect of advertising.

Studies that use cross-sectional data to measure tobacco advertising are less common. Cross-sectional data can differ but typically are at the level of a local market area and have greater variation than national-level data for several reasons. Local markets are exposed to different

*This practice also is known as flighting, and the advertising period is known as a flight.

†In a regression, the advertising coefficient is equal to the slope of the response function.

levels of advertising because of pulsing and because of differences in local relative media costs. A media plan may call for a different schedule of pulses in different cities or regions and a different mix of media. This creates variation in advertising across local areas, which increases the probability that some areas are exposed to a range of nonzero marginal effect of advertising. Figure 7.2 illustrates this situation, with the advertising data occurring in a range around M. Studies using local-level advertising data are more likely to find a positive relationship between advertising and consumption.

The third category of studies is based on tobacco advertising bans. The potential effect of a partial advertising ban is a downward shift of the response function, as figure 7.1 illustrates. A partial ban may not reduce the total level of advertising, but it will reduce the effectiveness of the remaining nonbanned media. The reason for this is that a ban on one or more media will result in a shift toward the remaining media. However, advertising in each medium is subject to a diminishing marginal effect. The increased use of nonbanned media will result in a lower average effect for these media. This shifts the overall media response function downward. When only a few media are banned (i.e., a weak ban or limited ban as defined by Saffer and Chaloupka 2000),[177] the change is minimal or modest and may be difficult to detect. However, when more media are banned (i.e., a comprehensive ban, defined by Saffer and Chaloupka as a ban on 5–7 media channels),[177] the magnitude of the change increases, the marginal impact of additional advertising in the remaining (nonbanned) media decreases, and the bans are more successful in suppressing consumption.

Firms may or may not respond to this decrease in effectiveness of their advertising expenditures. Some may try to compensate with more advertising in nonbanned media, which would be illustrated by moving to a higher level of advertising on a lower advertising response function.* Firms also might respond by increasing the use of other marketing techniques such as promotional allowances to retailers.

Two authors[178,179] make the interesting and almost universally ignored point that a study of cigarette advertising should, therefore, control for changes in the level of advertising in all industries. The level of advertising in all industries is defined as external advertising. The effect of external advertising can be explained with a simple example. Holding savings constant, if all industries, including cigarette manufacturers, doubled advertising, cigarette sales would not increase.† This is because the increase in advertising in each industry would be mutually canceling. Cigarette advertising should, therefore, be measured relative to external advertising.

Econometric Studies

Econometric studies of the effect of cigarette advertising on cigarette consumption are grouped into studies that use (1) time-series national expenditure data; (2) local-level, cross-sectional data; and (3) advertising bans. Table 7.5 provides a list of econometric studies and prior reviews. Each type of study and the results from previous reviews are described.

Time-Series National Expenditure Studies

Table 7.5 lists 15 econometric studies of cigarette advertising expenditure

*In a simple model, the decrease in marginal product would reduce the use of the input. However, in an oligopoly model, with response to rivals, one reaction to reduced sales is to increase advertising.

†This assumes that there is no change in the relative effectiveness of all advertising.

Table 7.5 Econometric Studies of Tobacco Advertising and Consumption

Study	Data	Major conclusions[a]
Time-series studies		
Hamilton 1972[180]	U.S. 1925–70	no effect of advertising
Schmalensee 1972[179]	U.S. 1955–67	no effect of advertising
McGuinness and Cowling 1975[181]	UK quarterly, 1957–68	small positive effect of advertising
Grabowski 1976[182]	U.S. 1956–72	no effect of advertising
Schneider et al. 1981[183]	US 1930–78	no effect of advertising
Bishop and Yoo 1985[184]	U.S. 1954–80	small positive effect of advertising
Abernethy and Teel 1986[185]	U.S. 1949–81	small positive effect of advertising
Baltagi and Levin 1986[186]	U.S. 1963–80	no effect of advertising
Johnson 1986[187]	Australian 1961–86	no effect of advertising
Porter 1986[188]	U.S. 1947–82	no effect of advertising
Chetwynd et al. 1988[189]	New Zealand, quarterly, 1973–85	small positive effect of advertising
Seldon and Doroodian 1989[190]	U.S. 1952–84	small positive effect of advertising
Wilcox and Vacker 1992[191]	U.S. quarterly, 1961–90	no effect of advertising
Valdes 1993[192]	Spanish 1964–88	small positive effect of advertising
Duffy 1995[193]	UK, quarterly, 1963–88	no effect of advertising
Cross-sectional studies		
Lewit et al. 1981[194]	7,000 youths 1966–70	positive effect of advertising
Roberts and Samuelson 1988[195]	1971–82 for 5 firms	positive effect of advertising
Goel and Morey 1995[196]	U.S. states 1959–82	positive effect of advertising
Advertising ban studies		
Hamilton 1975[197]	11 OECD countries	no effect of a ban
Laugesen and Meads 1991[198]	22 OECD countries 1960–86	negative effect of a ban
Stewart 1993[199]	22 OECD countries 1964–90	no effect of a broadcast ban
Saffer and Chaloupka 2000[177]	22 OECD countries 1970–92	negative effect of a ban
Saffer 2000[200]	102 countries 1970–95	negative effect of a ban
Prior reviews and other work		
Boddewyn 1986[201]	descriptive data	no effect of bans
Andrews and Franke 1991[202]	meta-analysis	positive effect of advertising
Smee et al. 1992[203]	literature review and 2 countries analysis	positive effect of advertising
Lancaster and Lancaster 2003[204]	literature review	no effect of advertising
Keeler et al. 2004[205]	U.S. 1990–2000 effect of MSA	positive effect of advertising
Nelson 2006[206]	international, meta-analysis	no effect of advertising

Note. UK = United Kingdom; OECD = Organisation for Economic Co-operation and Development; MSA = Master Settlement Agreement.
[a]"Positive effect" means an increase in consumption, and "negative effect" means a decrease in consumption.

studies, which use national annual or quarterly time-series data. All of these studies found either no effect or a small effect of advertising on cigarette demand. As mentioned earlier, it would be difficult to find an effect since the level of cigarette advertising is relatively high and national-level data may not provide sufficient

variance.* These studies typically use annual or quarterly data from one country, with 20 to 90 observations. Advertising usually is measured by expenditures, with control variables such as price and income included.

Chetwynd and colleagues[189] found a small effect with quarterly data that was lost when aggregation was increased to the annual level. This supports the theory that annual data have insufficient variance. Duffy[178] reviewed these studies and a few more that also use national-level advertising data. Duffy also reported that these studies found either no effect or a small effect, and concluded on the basis of these findings that cigarette advertising has no effect on cigarette consumption. An alternative conclusion, however, is that studies that use a single time series of national-level data measure the effect of advertising on consumption at a level of advertising for which little or no effect can be found, as illustrated by the industry response function in the area at N or higher in figure 7.1.

Local-Level Cross-Sectional Studies

Only three studies use cross-sectional data (table 7.5). The reason for so few cross-sectional studies is that the data are expensive and difficult to assemble. Cross-sectional data measure advertising over a range around M, as illustrated in the industry-level advertising response function at the market level shown in figure 7.2. Since external advertising primarily is national, it will have little cross-sectional variation and can be safely ignored. The study by Roberts and Samuelson[195] is somewhat different but still may be classified as cross-sectional. In their study, the cross-sectional unit is the firm. These researchers found that advertising increases market size and that market share is related to the number of brands sold by a company. These studies show that when advertising is measured over a wide range, such as with cross-sectional data, a significant positive effect of advertising is observed.

Advertising Bans

The third category of studies examine the effect of advertising bans on various aggregate-use measures. Partial advertising bans shift the function in figure 7.1 downward. Five studies of cigarette advertising bans using pooled international data sets have been published (table 7.5). Hamilton[197] used data on 11 countries over the period from 1948 to 1973 and presented a set of regressions using pooled data of countries with bans and countries without bans. The regressions show no effect from a ban. Laugesen and Meads[198] used data from 22 Organisation for Economic Co-operation and Development (OECD) countries for the period 1960 to 1986. Like Hamilton, Laugesen and Meads also found that before 1973, cigarette advertising bans had no effect on consumption. However, they found that after 1973, cigarette advertising bans have had a significant negative effect on consumption. Laugesen and Meads argued that, before 1973, manufacturers were able to increase alternative marketing efforts in response to broadcast advertising restrictions. This is unmeasured in the data set and offsets the effect of the broadcast bans. However, after 1973, more comprehensive antismoking legislation was enacted. These newer laws restricted advertising efforts to a greater degree and resulted in lower cigarette consumption. Stewart[199] conducted the third study of cigarette advertising bans. Stewart analyzed data from 22 OECD countries for the period 1964 to 1990 and found that a television advertising ban had no effect. This study did not control for other offsetting increases in advertising in other media and did not separately examine the more restrictive period after 1973.

*A flat portion of the function has a zero slope, which means a zero regression coefficient and no relationship between consumption and advertising.

One reason that the empirical results from these three studies are mixed is that the bans must be sufficiently inclusive to reduce the average effect of the nonbanned media so the industry does not compensate by increasing advertising or other marketing efforts. For example, a ban on television cigarette advertising alone may not be enough to affect total advertising, since other media and other marketing techniques can be used to compensate for the loss. Chapter 3, in the section titled "Ineffectiveness of partial advertising bans," reviews studies and examples of how tobacco companies have circumvented partial advertising bans.

The International Advertising Association (IAA) published another ban study as a report edited by Boddewyn.[201] According to tobacco industry and litigation documents, a British American Tobacco official was the report's ghostwriter.[207] The IAA report presented data on consumption in 16 nations (8 centrally planned economies and 8 free-market economies), all but one of which had adopted tobacco advertising bans or had no advertising. The study included no other controls on tobacco demand such as tobacco price or income. Price changes and income changes can have a larger effect on tobacco demand than advertising bans. Thus, the failure to control these effects makes it impossible to determine the effect of bans from this study.

Saffer and Chaloupka[177] estimated the effect of tobacco advertising bans by using an international aggregate data set consisting of 22 countries for the years 1970 through 1992. The advertising bans considered included seven media: television, radio, print, outdoor, point of purchase, movie, and sponsorship. Three ban variables were constructed. The first, a weak ban, equaled one if zero, one, or two bans were in effect. The second, a limited ban, equaled one if three or four media were banned. The third, a comprehensive ban, equaled one if five, six, or seven media were banned. A set of regressions limited to the period 1984 to 1992 showed that limited bans were not effective but that comprehensive bans were effective. The results suggest that moving from a limited ban to a comprehensive ban has a compounding effect that is consistent with the theory that limited bans allow substitution to other media. The results show that limited sets of bans are minimally effective in reducing the impact of advertising. However, comprehensive bans have a clear effect in reducing tobacco use.

Saffer[200] provided empirical research using data from 102 countries on the effect of tobacco advertising. The primary conclusion of this research was that a comprehensive set of tobacco advertising bans can reduce tobacco consumption and that a limited set of advertising bans will have little or no effect. The policy options that have been proposed for the control of tobacco advertising include limitations on the content of advertisements, restrictions on the placement of advertising, restrictions on the time that cigarette advertising can be placed on broadcast media, total advertising bans in one or more media, counteradvertising, and taxation of advertising. Saffer concluded that restrictions on content and placement of advertising and bans in only one or two media are not effective. However, comprehensive control programs, including comprehensive advertising bans, reduce cigarette consumption. Counteradvertising also can reduce tobacco use (see chapter 12). The taxation of advertising reduces total advertising and raises revenue that can be used to fund counteradvertising.

Prior Reviews and Other Work

Andrews and Franke[202] presented the results from 24 time-series studies of advertising and cigarette demand, which include 147 estimates of the advertising elasticity. They used these estimates to compute a mean elasticity and a variance for this mean. Meta-analysis assumes that all the data being analyzed come from randomized

trials. In a regression context, this means that all unobserved heterogeneity in each study was random or controlled. This is an unlikely possibility, and how robust the method is to violations in this assumption is not known in this context. Nevertheless, Andrews and Franke found a small positive effect of tobacco advertising—a weighted mean advertising elasticity of 0.060, which is significantly different from zero ($p < 0.039$). This means that a 10% increase in cigarette advertising expenditures would result in a 0.6% increase in cigarette sales. The authors also showed that the magnitude of the effect of advertising on sales (i.e., advertising elasticity estimates) declined over time in the United States and the United Kingdom—"a result which is to be expected as a product moves through its life cycle."[202]

Another meta-analysis by Nelson[206] reanalyzed the studies from the Andrews and Franke meta-analysis and included several additional ones. One criticism Nelson made of the Andrews and Franke analysis was that it included more than one estimate from the studies considered; multiple estimates from the same study are not independent. Nelson selected one estimate from each study for his meta-analysis, but the selection criteria were not well explained. The aggregate estimate of advertising elasticity from this study was not statistically different from zero. A subsequent erratum to this study disclosed that Nelson consults for a law firm that represents the tobacco industry.[208*]

A report prepared by the Economics and Operational Research Division of the UK Department of Health[203] provided an informative discussion of the econometric issues involved in estimation of the effects of advertising. The report pointed out that advertising is subject to diminishing marginal effectiveness and that studies using annual time-series data will measure the effects of advertising in a range in which marginal effects are likely to be small or zero. The report also indicated that studies of total or comprehensive bans examined across countries avoid many of the problems associated with time-series advertising studies because, in the case of ban studies, an advertising effect "will be on a larger scale and should show up more clearly." The report reviewed a number of prior time-series studies and found that enough studies reported positive results to conclude that advertising has a positive effect on consumption. In addition, the report also concluded that in Norway, Finland, Canada, and New Zealand, the banning of advertising was followed by a fall in smoking on a scale that cannot reasonably be attributed to other factors. The report also provided empirical results for Norway and the United Kingdom. Unfortunately, the analysis included lagged values of consumption as an independent variable and estimated these equations with ordinary least squares, which is known to create biased results.

Keeler and colleagues[205] estimated a demand function for cigarettes with the use of monthly data from 1990 to 2000. This was a period of significant advertising changes that resulted from the MSA. The MSA took effect in November 1998 and eliminated tobacco advertising on billboards, in transit media, and in most other outdoor venues. The researchers reported that tobacco companies had been reducing traditional media advertising in favor of other marketing techniques since 1980. They argued that the MSA resulted in a slowing of this trend, and as a result, a decrease in the reduction in cigarette sales. This was a time-series study, but since

*Erratum: "The author consults with a law firm that represents the tobacco industry. The paper was independently prepared by the author and was not reviewed by the law firm prior to submission for publication. I wish to thank two anonymous referees for helpful comments on an earlier draft. The usual caveats apply."

the primary source of advertising variation was the exogenous shift in advertising due to the MSA, this study is not in the same category as the older time-series studies reviewed above, and is more credible than those older studies. Keeler and colleagues estimated an advertising elasticity of 0.27, which is large for this type of elasticity.

Lancaster and Lancaster[204] reviewed 35 single-country studies of tobacco advertising and found that overall advertising had little or no effect on consumption. These results are consistent with the industry-level advertising response function about the point N (figure 7.1). These researchers also reviewed 21 studies of tobacco advertising bans. Here, the evidence was mixed, but the authors concluded that bans had no effect. Some of these ban studies examined only limited bans, which are not likely to have any effect.

Time-Series Studies of Smoking Initiation and Brand Choice

Besides examination of time-series expenditure data and cigarette consumption, other investigators have studied measures of smoking initiation. Pierce and Gilpin[209] examined annual age-specific rates of smoking initiation from the late 1800s through the 1970s. They note changes in these rates following the launching of novel and aggressive cigarette advertising campaigns. The early campaigns were targeted at males, and this group, but not females, showed increased initiation. In the 1920s, when women became the target of advertising (e.g., "Reach for a Lucky Instead of a Sweet"), initiation incidence rates increased for both female adolescents and adults, but not for males. Advertisements for "women's brands" (e.g., Virginia Slims) were heavily featured in the late 1960s. Girls, but not women or males of any age, showed increased rates of initiation.[209,210] The increases in initiation observed appeared to be specific to the group being targeted by the advertising campaigns.

Another analysis of adolescent and young adult initiation rates showed that after a decline in the early 1980s, there was an increase in adolescent but not young adult initiation rates. This increase coincided with R.J. Reynolds's Joe Camel campaign, perhaps reinforced by both the "Camel Cash" and "Marlboro Mile" promotions programs.[211,212] Another study[213] compared observed and expected rates of initiation of daily smoking among 9th graders (using Monitoring-the-Future data) with tobacco industry promotional expenditures. Using diffusion modeling, observed rates departed significantly from expected rates coincident with the increase in tobacco industry resources devoted to promotional activities.

A study published in 2006 examined the temporal relationship between health-theme magazine advertising for low-tar cigarette brands and sales of these brands.[214] The authors reviewed cigarette advertisements published in 13 widely read magazines from 1960 to 1990 and noted the type of low-tar brand and whether the theme of the advertisement implied a health advantage. Two types of low-tar brands were considered: (1) those (14 in all) that represented a brand extension of a regular-tar brand (e.g., Marlboro Lights) and (2) those brands (6 in all) that had always been exclusively low tar (e.g., Carlton). Advertising that carried a health theme then was computed as a proportion of all advertising for these brands and plotted together with the proportion of sales of these brands among sales for all brands.

For the brand extensions, the health theme began in 1965 and increased slowly until 1975 (around 5% of all advertising for these brands), then increased markedly until 1977 (nearly 35% of all advertising of these brands). Sales for the low-tar brand extensions were low (<5% of total) until

1976 but increased rapidly until 1982 (23%). By 1985, the health-theme advertising had returned to a low level (just over 5%), but sales remained high, reaching 25% in 1990. The pattern for exclusively low-tar brands was different. While sales also increased rapidly following a marked increase in health-theme advertising beginning in 1974, the health-theme advertising remained at nearly peak levels (30%–40%) through 1990. Sales peaked at about 15% in 1981 and declined slightly thereafter to 10% in 1990.

For both brand types, marked increases in health-theme advertising were followed by increases in sales. It appeared, however, that once the brand extensions were established, further such advertising was not necessary to retain brand share, but advertising was needed for the exclusively low-tar brands.

Further information on advertising for low-tar cigarettes appears in chapters 4 and 5.

Summary

The most definitive evidence of the influence of cigarette marketing on youth smoking would involve experimental manipulation of adolescents' long-term exposure to cigarette marketing and assessment of its impact on adolescents' initiation of smoking. However, such a study would be either unethical or unfeasible. Nevertheless, a body of experimental evidence exists about the effect of brief exposure to cigarette marketing on images of smokers, perceptions about the prevalence of smoking among adolescents, and intentions to smoke.[95–99] Further, an abundance of evidence from multiple lines of research using other study designs collectively establishes a causal link between tobacco marketing and smoking behavior.

Adolescent Psychological Needs

One type of evidence involves adolescent psychological needs. Many adolescents are motivated to smoke by the perception that doing so will help fulfill important psychological needs. Adolescents perceive that smoking will contribute to popularity and that advertising conveys this message. Those who believe the message are more likely to smoke. In addition, tobacco company documents show that marketing for cigarette brands popular with youth associates smoking those brands with popularity.

Many adolescents perceive that smoking will confer attributes associated with success with the opposite sex—toughness in the case of boys and slenderness in the case of girls. Girls are more likely to smoke if they think it will help them be thin and attractive. Cigarette marketing conveys that young women who smoke are high in sex appeal. Tobacco company documents show that several of the most youth-popular brands have been consistently and effectively associated with an image of rugged masculinity and sex appeal.

Many adolescents have a need to be rebellious and see smokers as having this characteristic. As a result, rebelliousness is a predictor of smoking initiation. At least one cigarette brand—Camel—is marketed for the rebellious.

Adolescents' needs for sensation, risk taking, and fun also are associated with smoking. Adolescents high in sensation seeking are more likely to smoke. Cigarette marketing frequently associates smoking with themes of fun and excitement. Many adolescents feel that cigarette advertising conveys that smokers will derive pleasure from smoking.

Cigarette marketing also exploits adolescents' needs to cope with depression and anxiety. Many adolescents perceive that smoking can help reduce distress. Adolescents high in stress or depression appear more likely to smoke. Those who are depressed and receptive to cigarette

advertising are particularly vulnerable to initiating smoking. Numerous tobacco company documents indicate that cigarette marketing often conveys that smoking youth-popular brands will help a person to relax or better cope with stress.

Cigarette Marketing and Image Enhancement

Because of the importance of popularity and peer acceptance in adolescence, most teenagers have a strong need for a positive self-image. Many adolescents perceive smokers to have a number of desirable traits. The perception that smoking will reinforce a desired self-image motivates those adolescents to smoke.

Both correlational and experimental studies show that exposure to cigarette marketing influences adolescents to have a more favorable image of smokers, to perceive that smoking among adolescents is more prevalent, and to have more positive intentions to smoke. The experimental studies provide particularly strong evidence of the influence of marketing. They control for other possible influences on smoking and rule out the possibility that there is a relationship between smoking and exposure to advertising simply because both are due to some third variable, such as innate curiosity about smoking.

Exposure to Cigarette Marketing and Smoking Susceptibility and Behavior

This chapter reviewed a large number of cross-sectional and longitudinal studies dealing with the relationship between various measures of exposure to cigarette marketing and several different measures of susceptibility to smoking and actual smoking. The longitudinal studies provide strong evidence of such an effect, since exposure to tobacco marketing occurs before changes in smoking behavior occur. The findings are robust and consistent. In the overwhelming majority of studies, exposure to cigarette marketing was associated with smoking behavior. This was for diverse measures of exposure including self-reported exposure to advertisements, derived estimates of adolescents' exposure, recall of specific advertisements, recognition of brands in advertisements in which brand information had been removed, a variety of attitudes toward the advertisements, beliefs about the impact of advertising, and multicomponent indices of adolescents' receptivity to cigarette advertising. Measures of exposure predicted both increases in adolescents' stated intentions to smoke as well as the actual initiation of smoking.

Tobacco companies have repeatedly asserted that peer and family influences—not their marketing practices—influence adolescents to smoke. However, many of these cross-sectional and longitudinal studies of the influence of marketing exposure measured and analyzed social influences along with tobacco marketing exposure. They generally found that marketing practices influence adolescent smoking even after controlling for peer and parental influences. Indeed, a number of the studies that used advertising and influence of peers and parents to predict later smoking or intent to smoke found that advertising exposure is a stronger predictor than peer or parental smoking.[150,154,155,160]

Yet, these studies probably underestimate the influence of marketing practices, since some marketing influence develops through peers and parents. For example, tobacco companies design marketing to influence the perception that popular people smoke specific brands. These practices influence not just one person, but entire peer groups. Because of exposure to these advertisements, some adolescent peer groups may view smoking as the "in" thing. Theses groups are then more likely to approve and

admire someone who smokes a brand that marketing tells them "in" people smoke.

Thus, evidence that an adolescent is more likely to smoke if his or her friends smoke, is, in part, due to the influence cigarette marketing has on the entire peer group. Advertising that associates a cigarette brand with popularity prepares an entire peer group to approve of those who smoke it. When adolescents correctly perceive Marlboro as a popular brand, they perceive that their peers will accept them if they smoke it.

Effects of Tobacco Advertising on Tobacco Consumption

The issues and studies relative to this line of evidence indicate, at a minimum, that empirical estimation of the effects of tobacco advertising on tobacco consumption is a complex challenge. The most potentially valid econometric strategies are either cross-sectional data with advertising measured by independent sources at a local level or international data on comprehensive advertising bans. Many econometric studies use small samples of highly aggregated national time-series data and find little or no effect of advertising. This is because the advertising data employed have little variance and are measured at a level of expenditure at which advertising has little or no marginal effect. However, a meta-analysis that pooled the results of 24 such studies did find a small, but statistically significant, positive effect of advertising on cigarette consumption. The evidence from cross-sectional studies using disaggregated local-level data does indicate an effect of advertising on consumption. These time-series and cross-sectional studies support the theory that the industry response function slopes upward and is subject to diminishing marginal effects.

The studies of advertising bans suggest that bans can reduce consumption under certain circumstances. Banning advertising in a limited number of media has little or no effect. Limited advertising bans do not reduce the total level of advertising expenditure but simply result in substitution to the remaining nonbanned media or to other marketing activities. Banning advertising in most or all available media can reduce tobacco consumption, because, in these circumstances, the possibilities for substitution to other media are limited.

Conclusions

1. Much tobacco advertising targets the psychological needs of adolescents, such as popularity, peer acceptance, and positive self-image. Advertising creates the perception that smoking will satisfy these needs.
2. Adolescents who believe that smoking can satisfy their psychological needs or whose desired image of themselves is similar to their image of smokers are more likely to smoke cigarettes.
3. Experimental studies show that even brief exposure to tobacco advertising influences adolescents' attitudes and perceptions about smoking and smokers, and adolescents' intentions to smoke.
4. The vast majority of cross-sectional studies find an association between exposure to cigarette advertising, measured in numerous ways, and adolescent smoking behavior, measured in numerous ways, indicating a robust association.
5. Strong and consistent evidence from longitudinal studies indicates that exposure to cigarette advertising influences nonsmoking adolescents to initiate smoking and to move toward regular smoking.
6. Many econometric studies have used national time-series data to

examine the association between tobacco advertising expenditures and tobacco consumption. Some of these studies found a small positive effect of advertising on consumption. Other studies failed to find a positive effect, probably because the data used had little variance and were measured at a high level of advertising expenditure at which changes in the volume of advertising have little or no marginal effect.

7. The evidence from three cross-sectional econometric studies using disaggregated local-level data indicates a positive effect of advertising on tobacco consumption.

8. The studies of tobacco advertising bans in various countries show that comprehensive bans reduce tobacco consumption. Noncomprehensive restrictions generally induce an increase in expenditures for advertising in "nonbanned" media and for other marketing activities, which offset the effect of the partial ban so that any net change in consumption is minimal or undetectable.

9. The total weight of evidence from multiple types of studies, conducted by investigators from different disciplines, using data from many countries, demonstrates a causal relationship between tobacco advertising and promotion and increased tobacco use, as manifested by increased smoking initiation and increased per capita tobacco consumption in the population.

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