Role of Media in Influencing Trajectories of Youth Smoking

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Abstract

This paper summarizes results of empirical studies on cigarette advertising and promotions, anti-smoking advertising, product placement in movies, on television and in music media, and news coverage about smoking. In addition, we provide an overview of some of the theoretical literature relevant to the study of media uses and effects. Finally, we discuss empirical findings in the context of these theories to draw some conclusions about media influences on smoking and identify issues for further research. We conclude that (a) the media both shape and reflect social values about smoking; (b) media provide new information about smoking directly to audiences; (c) media act as a source of observational learning by providing models which teenagers may seek to emulate; (d) exposure to media messages about smoking also provides direct reinforcement for smoking or not smoking; (e) the media promote interpersonal discussion about smoking; (f) the media can influence 'intervening' behaviors that may make teenage smoking less likely, and; (g) anti-smoking media messages can also set the agenda for other change at the community, state or national level. We outline priorities for further research, which emphasize the need for longitudinal studies and multi-level analyses of advertising effects, an awareness of the likely dynamic relationship between tobacco advertising and anti-smoking advertising, the importance of determining appraisal of tobacco industry

youth smoking prevention efforts, and the dearth of research on news coverage about smoking.

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Introduction

Media messages are endemic in our society, through exposure to television and radio, movies, outdoor and point of sale advertising, via newspapers and magazines, on the internet and through books, brochures and posters. In the United States, more families own a television set than a telephone (Nielsen Media Research, 1995). Given a conservative estimate of 2.5 hours of watching TV each day over a lifetime, and assuming 8 hours of sleep per night, the average American would spend 7 years out of the approximately 47 waking years we have by age 70 watching TV (Kubey & Csikszentmihalyi 1998). Young people average 16 to 18 hours of television watching per week, commencing at age 2 (American Medical Association, 1996). Adolescents can spend nearly equal amounts of time listening to the radio, although music is generally listened to while engaged in other activities (Klein et al., 1993). Over half of all 15 to 16 year olds have seen the majority of the most popular recent R-rated movies (Greenberg et al., 1987) and almost all have seen a copy of Playboy or Playgirl by the age of 15 (Brown & Bryant, 1989). In addition, the internet continues to increase in accessibility and popularity, exposing users to a wide range of information, previously not so accessible.

This paper is concerned with media messages about smoking and their impact on youth smoking. Many of these messages come in the form of paid advertising from tobacco companies, through promotions which offer accessories and clothing with cigarette brands emblazoned on them, and other communications about smoking which appear in the context of movies and in television programs and through sponsorships. Paid anti-

smoking advertising is becoming more common on television and in a range of other media, and is most often broadcast as one component of a comprehensive package of strategies aimed at influencing existing smokers to quit, non smokers not to start, and advocating for protection from secondhand smoke. In addition, the public is frequently exposed to news messages about smoking through television and radio news and current affairs programs, and articles in newspapers and magazines.

This paper aims to provide a review of the literature pertaining to media influences on tobacco, especially as these relate to youth smoking, and to summarize some of the conceptual thinking about the pathways by which media might influence the uptake of smoking among youth. The review has been undertaken as a first step toward gaining a better understanding of a range of contextual factors, including media, in influencing trajectories of youth smoking.

The review first summarizes results of empirical studies on cigarette advertising and promotions; anti-smoking advertising; product placement in movies, on television and in music media; and news coverage about smoking. The paper then gives an overview of some of the theoretical literature relevant to the study of media uses and effects. The final section of the paper provides a further discussion of empirical findings in the context of these theories to draw some conclusions about media influences on smoking and identify issues for further research.

Literature review: empirical studies

Cigarette advertising

In 1999, the tobacco industry spent $8.24 billion on advertising and promoting cigarettes (Federal Trade Commission, 2001). In the United States, tobacco advertising on billboards ended in April 1999 under the terms of the Master Settlement Agreement, but there is evidence that cigarette advertising increased in magazines since this time, including magazines with high youth readership (Turner-Bowker & Hamilton, 2000). Although Philip Morris recently announced its intention to refrain from advertising in such magazines, there is evidence that point of purchase advertising and promotions have increased since billboard advertising was banned (Wakefield et al, 2000), so that tobacco advertising is still highly prevalent and visible to teenagers.

The purpose of tobacco advertising is to imbue the product with an image that is sufficiently attractive to make people want to use it. There are a number of pathways through which advertising can increase cigarette consumption. Four direct mechanisms include a) encouraging youth to experiment with cigarettes and initiate regular use; b) increasing existing smokers level of daily consumption by acting as a cue to smoke; c) reducing existing smoker's motivation to quit; and d) encouraging former smokers to resume smoking (USDHHS, 1989). In addition, an indirect pathway which might lead to change in cigarette consumption is through the ubiquity and familiarity of tobacco advertising contributing to an environment where tobacco use is perceived to be more

socially acceptable, more normative, and less hazardous than it in fact is (USDHHS, 1989).

All forms of cigarette advertising and marketing work together to promote cigarettes to potential and existing consumers, so in a sense considering only that part of the range of marketing practices that are media-related is somewhat arbitrary. As explained by Kaufman & Nichter (1999), "modern marketing strives to attach symbolic meaning to specific tobacco brands by carefully manipulating the components of marketing: brand name, packaging, advertising, promotion, sponsorship, and placement in popular culture. The purpose of tobacco marketing is to associate its product with psychological and social needs that the consumer wants to fulfill, some of which emanate from the restructuring of social reality that advertising itself provides. Marketing is more successful when these components work in a synchronized fashion, surrounding the target consumers with stimuli from multiple sources" (p.5).

The tobacco industry has been extremely adept at creating images for cigarette brands over a long period of time, targeting advertising for different brands to women, African Americans, and youth (USDHHS, 1994, p179-184; Cummings et al., 1987; King et al., 2000; Hackbarth et al., 1995; Schooler et al., 1996; Luke et al., 2000). In addition, it has used the concern about the health risks of smoking to its advantage by promoting 'light' and 'low tar' cigarettes, leading consumers to believe they are smoking a 'safer' cigarette, whereas in fact there is no evidence that these types of cigarettes deliver less tar when smoked (ASH, UK, 2000; Pollay & Dewhurst, in press).

An early econometric study using disaggregated measures of youth exposure to advertising provided support for the contention that pro-smoking advertising significantly increases youth smoking (Lewit et al., 1981). Studies of smoking initiation using population samples convincingly demonstrate that increases in teenage smoking, but not adult smoking, correspond with specific cigarette advertising campaigns (Pierce et al, 1994; Pierce & Gilpin, 1995; Cummings et al 1995). Pollay and colleagues, using data from several large surveys of youth and adult smoking over a 20-year period, found that whenever the advertising of a brand increased, teen smoking of that brand was increased three times more than adult smoking of the same brand (Pollay, 1996).

The empirical evidence on the impact of tobacco advertising bans on smoking indicates that complete advertising bans do influence aggregate cigarette consumption (Chaloupka & Warner, 1999). Many econometric studies of partial advertising bans conclude that there is little or no effect on aggregate cigarette sales (Chaloupka & Warner, 1999). Since the advertising bans examined in these studies were partial bans, and because advertising expenditures are so high, a marginal change in expenditure will be unlikely to have any impact on aggregate sales. In addition, the tobacco industry is able to compensate for inability to advertise in one medium, by transferring advertising dollars to other media outlets, so that there is, in effect, little overall change in expenditure (Warner, 1986a; USDHHS, 1989; Pollay et al., 1996; Saffer, 1998). A recent analysis of data on 22 OECD countries from 1970-1992 concluded that *comprehensive* bans on advertising/promotion significantly reduce smoking, while limited bans have little or no effect (Saffer & Chaloupka, 1999).

There is substantial empirical evidence that children are exposed to, and remember cigarette advertising (Pierce et al., 1993; DiFranza et al., 1991). A series of cross-sectional studies have demonstrated that awareness, exposure, and liking of cigarette advertising is associated with smoking status and smoking initiation among teenagers, and are independent of other predictors of smoking such as peer,sibling and parental smoking . (O'Connell et al, 1981; Potts et al, 1986; DiFranza et al, 1991; Botvin et al 1991; 1993; Schooler et al., 1996). Brand recall and recognition is higher among teenage smokers than nonsmokers in Australia, (Chapman & Fitzgerald, 1982); the USA (Goldstein et al., 1987; DiFranza & Aisquith, 1995; McCann, 1992), Britain (Aitken et al, 1985a; 1985b; 1987; Aitken & Eadie, 1990) and Hong Kong (Peters et al, 1995).

Longitudinal studies provide more convincing evidence about the temporal relationship between cigarette advertising and smoking behavior. Alexander et al (1983), in following a cohort of schoolchildren aged 10 to 12 years over a one year period found approval of cigarette advertising to be associated among baseline nonsmokers with taking up smoking, and disapproval among baseline smokers to be associated with quitting smoking. Armstrong et al (1990) found self-reported advertising-induced urges to try smoking to be positively associated with taking up smoking at a 1-2 year follow-up. In a one-year follow-up survey of the Scottish study mentioned previously, prior awareness of cigarette advertising was related to a stronger intention to smoke at follow-up after controlling for potential confounders (Aitken et al, 1991). Using data from a cohort of 12-15 year olds in Massachusetts, baseline brand-specific exposure to cigarette advertising in magazines was found to be highly correlated with brand of initiation

among new smokers, brand smoked by current smokers and brand whose advertisements attracted the most attention (Pucci & Siegel, 1999).

Exposure to and approval of advertising also seems to work in concert with ownership of or willingness to use cigarette promotional items in influencing smoking. Teenagers have a high level of participation in ownership of cigarette promotional items (Pierce et al, 1998a; Biener & Siegel, 2000; Sargent et al, in press). A series of cross-sectional studies have shown associations between ownership of cigarette promotional items and susceptibility to smoking (Evans et al.,1995; Altman et al., 1996; Feighery et al., 1998), smoking behavior (Gilpin et al., 1997; Schooler et al., 1996) age at beginning to smoke (Unger & Chen, 1999) and cigarette consumption among youth (Sargent et al., in press). Three longitudinal studies have demonstrated that youth who own promotional items are more likely to go on to be smokers (Pierce et al, 1998a; Biener & Siegel, 2000; Sargent et al, 2000), with significant concordance between ownership of branded tobacco promotional items among teenage nonsmokers and the brand teenagers say they would choose if they did smoke (Sargent et al, in press). Redmond (1999) has shown that in years of high tobacco industry promotional expenditure, the rate of smoking initiation among US ninth graders was higher than expected. These studies imply that choosing to own or wear a cigarette promotional item may lead to a consolidation of an identity that includes being a smoker. The symbolic function of owning a cigarette promotional item may reinforce social and group identification, acting to maintain identification of the self as a smoker.

Taken together, these studies suggest that cigarette advertising and promotion likely has both predisposing and reinforcing effects on youth smoking, acting as an inducement to experiment with smoking, and reinforcing continued progression towards regular smoking among those who already have tried it. While these effects generally apply after holding constant the established influence of parental, sibling and friend's smoking, further investigation of differential effects of cigarette advertising by baseline characteristics is rare. For example, there is little study of the influence of advertising on progression across different stages of the uptake continuum – for example whether it is more strongly linked to initial experimentation, rather than progression from experimentation to regular use.

Anti-smoking advertising

Research concerned with the effects of anti-smoking advertising on teenagers has spanned a number of disciplines and methodologies. There are five basic types of studies: field experiments of persuasive mass-media interventions, some of which have occurred in concert with school-based prevention programs; population-based studies as part of the evaluation of government funded anti-smoking campaigns; ecologic studies using aggregate data on anti-smoking advertising and/or youth smoking; qualitative studies of youth appraisal of anti-smoking ads; and controlled laboratory experiments.

Field experiments

Table 1 summarizes the design and results of nine controlled experimental studies whereby youth have been exposed to persuasive anti-smoking mass media messages, sometimes in combination with school-based smoking prevention programs, and followed over time to compare differences in smoking. In some cases, due to study design, it was not possible to determine whether effects were due to the media intervention or school intervention, or a combination (eg Vartiainen et al., 1986; 1990; 1998; Perry et al., 1992). In the Midwestern Prevention Project however (Johnson et al., 1990), it was observed that effect sizes for the combined media and school intervention were nearly double those of studies of the effects of school program alone (Tobler & Stratton, 1997). Furthermore, in two trials where both strategies were compared, effects were significantly greater where anti-smoking advertising occurred (Flynn et al, 1992; 1994; 1997; Secker-Walker et al., 1997; Worden et al., 1998; Worden & Flynn, 2000; Biglan et al., 2000).

Insert Table 1 about here

Overall, these studies suggest that anti-smoking advertising can have a beneficial effect on teenage smoking, and may be strengthened by concomitant exposure to school-based smoking prevention programs. The pattern of findings from these studies suggest that anti-smoking advertising may play a greater role in preventing the uptake of smoking among teenagers, rather than promoting cessation among teenagers who already smoke, since in several studies, most effects were observed for baseline nonsmokers. Consistent

with this, effects seem more reliable when exposure occurs early, than later in adolescence, with greater effects observed in trials involving pre-teenagers and younger teenagers. However, other factors aside from smoking experience, may mediate the effects of anti-smoking advertising.

In the Vermont study, for example, greater effects were observed in preventing uptake of smoking for high risk (two or more smoking influences in their immediate environment) than low risk girls. The authors suggest that the higher risk sample were faced with making decisive choices about smoking earlier in life because of the strong smoking models in their environment and that the media messages supporting nonsmoking decisions may have provided protective effects at this critical juncture. By contrast, lower risk students may not have faced these decisive choices until later in adolescence, after the intervention period had ended.

In addition, since smoking among high risk girls was relatively more greatly reduced than among high risk boys, gender may be an additionally important variable which mediates the effect of media messages. This may be because girls saw more of the ads than boys, or because the message content of the ads (how to manage social relationships without being a smoker) may have been of greater utility to girls than boys. Alternatively, girls age into puberty earlier than boys, so these effects could have been largely due to the ads portraying information during a critical period of their adolescent development, which was only later to be experienced by boys, at a time when the intervention was coming to completion.

Thus, gender and immediate social influences may mediate potential effects of anti-smoking advertising, as well as age and previous smoking experience. Results from the controlled study in Norway also point to the mediating role of the social environment, leading the authors to conclude that emotional reactions to campaigns are mediated through interpersonal discussions by the attitudes and opinions of significant others and by social norms regarding smoking.

Evaluation of anti-smoking campaigns as part of government-funded tobacco control programs

Evaluation of state and national government-funded anti-smoking advertising campaigns provide a rich source of information about the effects of such advertising on teenagers. However, it is acknowledged that the media campaign is only one part of the entire anti-smoking effort, which additionally encompasses community-based initiatives such as school smoking prevention programs, worksite cessation programs, local policy enactment and enforcement and greater access to cessation services. Furthermore, many of the state tobacco control programs have been funded by a percentage of the cigarette tax, leading to an increase in the price of cigarettes and a necessity to interpret changes accordingly.

Early studies from Australia suggested that mass-media anti-smoking campaigns could reduce population smoking among adults (Pierce et al, 1986; Pierce et al, 1990; Macaskill et al, 1992). The early evidence was gathered from an evaluation of a campaign

broadcast in Sydney, Australia, which encouraged smokers to quit and to set the agenda for health professionals to reinforce the importance of not smoking. Melbourne, Australia, was used as a non-campaign comparison community. In the intervention community, a significant decline in prevalence of 2.8% was observed, compared with no change in the control community (Pierce et al, 1986). When a similar campaign was later commenced in the control community, smoking prevalence trend data from 1981 showed that there was an immediate drop in smoking prevalence in both communities associated with the start of the respective campaigns, and a lesser decline thereafter (Pierce et al, 1990).

In the United States, the first statewide anti-smoking mass media campaign was conducted in Minnesota from 1986, as a result of government funding of approximately $2 million per year. Advertising designed to increase youth awareness of the negative social consequences of smoking and to correct normative expectations for smoking among adolescents were broadcast on television and radio and displayed in newspapers and on billboards. From 1986 to 1990, reported exposure to anti-smoking advertising was significantly higher among 9th graders in Minnesota than the control state of Wisconsin, but there were no changes in smoking-related beliefs (Murray et al, 1994) or behavior (Murray et al., 1992). The investigators suggest that the lack of effect may have been due to the lack of ongoing and substantive school-based smoking prevention programs, and speculated that both media and school programs may be required to influence youth smoking.

Table 2 summarizes information about ongoing statewide comprehensive tobacco control programs in the United States that had media campaigns as an important element up to 1999. The California Tobacco Control Program (CTCP), funded by Proposition 99 from 1989, was the first ongoing comprehensive statewide tobacco control program in the United States.

Insert Table 2 about here

An early evaluation of the media campaign involving a series of cross-sectional surveys of school students in grades 4 through 12 in California demonstrated a significant increase in recall of the media campaign, attitudes more unfavorable towards smoking, a decrease in intention to smoke and a decline in 30-day smoking prevalence (Popham et al., 1994). However, there was no unexposed control group for comparison purposes. As indicated in Table 2, the CTCP has been associated with greater declines in per capita cigarette consumption and adult smoking prevalence than the rest of the USA, especially during the early program period when funding was highest.

From cross-sectional surveys conducted within California, standardized 30-day smoking prevalence did not change among 12 to 17 year olds from 1990 to 1993 (9.2%), but from 1993 to 1996, increased significantly from 9.2% to 12.0%, coincident with the reduced amount of tobacco control funding and the increased ratio of tobacco industry to tobacco control funding (Pierce et al, 1998b). In addition, there was an increase in the percentage of 12 to 14 year olds who were susceptible to becoming smokers (from 34.5% in 1993 to

42.0% in 1996). Comparison of data from the school-based Monitoring the Future Surveys shows that although smoking increased in California between 1993 and 1996 in both 8th (relative increase of 16%) and 10th graders (relative increase of 6%), this was less than was observed for 8th (increase of 29%) and 10th graders (increase of 23%) in the rest of the United States (Unger et al., 1998). The relative increase in 30-day smoking among 12th graders was lower in California than for the rest of the United States from 1991 to 1996 (Johnson, 1997).

The Massachusetts Tobacco Control Program (MTCP) was established in October 1993 and has the highest level of per capita funding of all US states. The mass media component of the campaign has emphasized the health effects of smoking and passive smoking, as well as prevention messages aimed at youth. Per capita cigarette consumption declined with the start of the program to an extent greater than that expected from a short-term price increase, suggesting that the media campaign was an important component in this change (Harris et al., 1996). Furthermore, adult smoking prevalence has significantly declined since the start of the program, compared with other US states (Harris et al., 1996; Biener et al., 2000).

From 1993 to 1996, , the relative change in smoking prevalence in Massachusetts teens compared with their counterparts in the rest of the US was in the opposite direction for 8th graders (1.9 percent *decrease* in Massachusetts compared with a 25.7 percent increase for rest of US), and has been minimized for 10th graders (16.3 percent increase for Massachusetts compared with 23.1 percent increase for the rest of the US) and 12th

graders (7.4 percent increase for Massachusetts compared with 13.7 percent increase for US) (Briton et al., 1997). More recent data confirm this trend. From 1995 through 1997, smoking prevalence among all Massachusetts students changed from 35.7 to 34.4 percent (a relative *decrease* of 3.6 percent), compared to a change from 34.8 to 36.4 percent nationally (a relative *increase* of 4.5 percent) (CDC, 1999). Surveys also show a decline in lifetime cigarette use among 7th to 9th graders in Massachusetts (Massachusetts Department of Education, 1998; Soldz et al., 2000). Of most interest, comparisons with national data from the MTF surveys show a relative decline of 4.6 percent in lifetime cigarette use for 8th graders in Massachusetts (from 52.2 to 49.8 percent), against a national relative *increase* of 9.5 percent (from 45.3 to 49.3 percent) (Briton et al, 1997).

A recent study used data from a four-year longitudinal population sample of Massachusetts youth aged 12-15 in 1993 to specifically examine the impact of anti-smoking advertising on smoking behavior (Siegel & Biener, 2000). In the four year period of the campaign, Massachusetts spent more than $50 million or $8 per capita on its media campaign. Among younger adolescents (aged 12-13 at baseline), recall of anti-smoking advertising on television in the past 30 days was significantly associated with a lower rate of progression to established smoking (self-report of smoking 100 cigarettes) at a four year follow-up, after controlling for age, gender, race, baseline smoking status, smoking by parents, friends, and siblings, television viewing frequency and exposure to non media campaign related anti-smoking messages. However, exposure to television anti-smoking advertisements had no effect on progression to established smoking among

older adolescents (aged 14-15 at baseline), and there were no effects of exposure to radio or billboard advertising.

Baseline exposure to anti-smoking advertising was not associated with subsequent differences in seven of eight smoking-related knowledge and attitude variables. However, youths exposed to anti-smoking advertising were 2.3 times more likely to report at follow-up that less than half the kids at their high school were smokers. In this cohort study, the relationship between exposure to anti-smoking advertising and this variable, denoting an accurate as opposed to inflated perception of youth smoking prevalence, was stronger for those aged 12-13 at baseline than for older adolescents (Siegel & Biener, 2000). This pattern of results suggests that the protective effect of anti-smoking advertising may in part be mediated by reducing perceived youth smoking prevalence (at least two of the ads aimed to show that smoking was not the norm), which itself is known to have a strong influence on youth smoking initiation (Sussman et al., 1988; Chassin et al., 1984; USDHHS, 1994). These results are consistent with indications from earlier research that anti-smoking advertising may have more demonstrable impact on younger than older teens.

Unlike the other statewide comprehensive programs, the Florida Tobacco Pilot Program (FTPP) funding was provided through the provisions of the settlement between the state and tobacco companies (Wakefield & Chaloupka, 2000). The so-called “Truth” campaign began in April 1998, was aimed at teenagers aged 12 to 17 years, and placed particular emphasis on engendering unfavorable attitudes towards the tobacco industry. The

program also fostered community partnerships with all 67 Florida counties, school-based initiatives, an education and training initiative, enhanced enforcement of youth tobacco access laws and a law that penalized youth for possession of tobacco.

Media tracking surveys of teenagers demonstrated high rates of campaign awareness, and specific ad awareness in the first six weeks of the campaign, which persisted to one year (Sly et al., 2001a). In addition, over the first year of the campaign, there was change in attitudes consistent with the intention of campaign messages, and decreases in adolescent intentions to smoke and smoking behavior among Florida youth, compared with youth in other states with low levels of anti-smoking activity (Sly et al., 2001a). In addition, in a follow-up study of Florida youth aged 12-17 years, those scoring at intermediate and high levels on an index of "Truth" advertising impact, were less likely to initiate smoking than youth who could not confirm awareness of the television advertisements (Sly et al., 2001b).

Furthermore, in surveys undertaken by the Florida Department of Health, the prevalence of 30 day cigarette use among middle school students significantly declined between 1998 and 1999 from 18.5% to 15.0% (decline of 18.9%) and among high school students from 27.4% to 25.2% (decline of 8.0%) (Bauer et al., 1999). The trends observed in Florida are substantially larger than the modest relative declines observed (of 6.9% and 1.4% for middle and high school students respectively) between 1998 and 1999 from the Monitoring the Future surveys (University of Michigan News and Information Service, 1999). A recent study indicated that these declines among Florida youth continued

through 2000, and additionally, that the percentage of committed nonsmokers significantly increased (Bauer et al., 2000).

Two other states have been running statewide tobacco control programs for several years – Arizona has been in the field since 1996 and Oregon since 1997. Oregon has elected to run anti-smoking ads already developed in other states that pre-test well, thereby allocating the bulk of media funding to broadcasting, rather than ad development. However, Arizona specifically developed and directed its media advertising to pre-teens and teens, as well as pregnant women and only in 1999 began including adults as a target group for media (Wakefield & Chaloupka, 2000). For both states, recall of media elements of the program by teenagers has been high (Oregon Health Division, 1999; Eisenberg et al., 1998). A rating evaluation of the Arizona ads by 1,831 6^{th} to 12^{th} graders in Arizona indicated that many of the ads were perceived as being relevant to them and reduced their intention to smoke, especially among existing nonsmokers (Burgoon, 1999). Trends in tobacco use by adolescents in Oregon mirrored national trends for the first two years following commencement of the program (Oregon Health Division, 1999) and most recent state figures indicated a substantial and significant decline in 8^{th} grade smoking between 1998 and 1999 (Associated Press, 2000), which was greater than national trends, although different survey methods were used, so these figures are still inconclusive. The extent of decline in per capita consumption following the introduction of the Oregon Tobacco Education and Prevention Program (Pizacani et al, 1999) is highly consistent with what has been observed in California and

Massachusetts. However, in Arizona, follow-up data are not yet available to track change in teenage smoking.

With few exceptions, this body of research has been concerned with determining whether a statewide comprehensive tobacco control program is associated with reduced cigarette consumption and lower smoking prevalence among adults and teenagers. To a great extent, the overriding aim of determining the impact of the overall program on population smoking has been pursued at the expense of more fine-grained research which might have been focused on the advertising itself, and upon individual differences in responsiveness to advertising messages. The study by Siegel and Biener (2000) is one of the few to have gone beyond these overarching aims, in taking a closer look at individual differences.

Overall, the conclusion from the studies of government funded anti-smoking campaigns is that they do reduce adult and youth smoking (Wakefield & Chaloupka, 2000; Institute of Medicine, 2000). Aggregate per capita consumption declines in response to the onset of campaign activities and does so in a magnitude greater than that expected on the basis of a price increase alone. However, because adolescent smoking comprises only a small percentage of overall aggregate consumption, these results are generally interpreted as being more indicative of adult change rather than, although not excluding, change in teenage smoking behavior. However, cross-sectional and longitudinal population survey research adds additional evidence that these types of campaigns can have enduring effects

on reducing teenage smoking. Importantly, a salient finding from this literature is that campaigns seem to have more influence on younger, than older, teens.

Comparative effectiveness of anti-smoking themes

Plainly, not all anti-smoking advertising is equal. A growing body of research has begun to explore the types of anti-smoking message themes that might best resonate with youth (Goldman & Glantz, 1998; Balch & Rudman, 1998; Worden et al., 1998; Pechman & Goldberg, 1998; Perrachio & Luna, 1998; Teenage Research Unlimited, 1999; Hill et al., 1999; Wakefield et al., 1999; Harrison Health Research, 1998). This research has produced mixed findings, probably due to the different methodologies involved, but some consistencies emerge.

Advertisements which elicit strong emotional arousal, typically those that graphically portray the adverse consequences of smoking, often rate highly among teens and adults, and are associated with increased intention not to smoke (Teenage Research Unlimited, 1999; Hill et al., 1999; Wakefield et al., 1999; Harrison Health Research, 1998). Ads highlighting the deceptive and misleading conduct of the tobacco industry typically require a more 'sophisticated' target audience with additional experience in understanding these messages (Teenage Research Unlimited, 1999; Pechmann & Goldberg, 1998). Ads with a theme emphasizing that teens need to make a choice about whether or not to smoke generally have lowest ratings among youth (Teenage Research Unlimited, 1999). Thus, the Philip Morris 'youth smoking prevention campaign', which

exclusively uses the better types of ads, are probably ineffective in motivating youth to 'stop and think' about smoking.

Another reason for inconsistent research findings is that advertising effectiveness is also influenced by the way in which the message is executed – for example, factors such as casting, lighting, sound, voiceovers, the number of frames, the setting and the wardrobe may all influence the 'take home' message of the advertisement, its memorability, personal relevance and persuasiveness. Furthermore, in the real world setting, ads are viewed in the context of television or radio programs, and this can influence how they are perceived (Aylesworth & MacKenzie, 1998). Also, advertising is received and interpreted in a context and this will differ according to the novelty of the message. Newly commenced anti-smoking advertising campaigns may have relatively high salience in some states investing for the first time in anti-smoking ads, but for states that have had anti-smoking advertising for years, rotation and careful scheduling of messages may be necessary to maintain message salience and avoid advertising 'wear out'. In addition, some messages may be more complex than others and may require a longer duration or higher frequency of exposure to engage the target audience as intended. Thus, research on the effectiveness of different messages themes in attempting to partition out one aspect of advertising as if all other factors that may influence impact are constant, which is clearly not the case. Further research in this field is needed.

Comparative analyses of anti-smoking advertising and cigarette advertising

From 1967 to 1970, prior to the ban on broadcast tobacco advertising in the United States, television networks were required by the Federal Communication Commission's Fairness Doctrine to broadcast one anti-smoking advertisement for approximately every three tobacco advertisements, and an exposure of one anti-smoking ad to every four tobacco ads was achieved. Over this period, nearly $200 million in commercial advertising time (in 1970 dollars) was donated for this purpose (Warner, 1979), equivalent to approximately $292 million per annum in 2000 dollars. Several empirical studies have found that, over the period these anti-smoking ads were broadcast, per capita cigarette consumption declined by over 10%, a trend that had occurred only once before in the century, when the health hazards of smoking were first publicized by the Surgeon-General in 1964 (Warner, 1979; Warner 1986a; Schneider et al, 1981; Baltagi & Levin, 1986). Furthermore, analysis showed that these changes involved teenagers (Lewit et al., 1981). When cigarette advertising was removed in 1971 and the anti-smoking ads were removed with them, consumption resumed an upward trend. In the late 1990's, the advertising and marketing expenditure of the tobacco industry has markedly increased in real terms, so that an anti-smoking expenditure equivalent to $1 billion per year would likely be required today to replicate the comparative exposure ratio of anti-smoking advertising to cigarette advertising achieved during the late 1960's.

Apart from this 'natural experiment', relatively few studies have sought to evaluate the comparative effects of different levels of exposure to anti-smoking advertising and cigarette advertising.

Pechmann and Ratneshwar (1994) exposed 7th graders in California to anti-smoking advertising, cigarette advertising or control advertising embedded in a magazine for adolescents. Later, they participated in an ostensibly unrelated study in which they read trait information about a peer who was either identified or not identified as a smoker. Youth's evaluative judgements of the peer and their thoughts and inferences about the person were then assessed. Anti-smoking ads were found to lower perceptions of a teenage smoker's common sense, personal appeal, maturity and glamor. In contrast, exposure to cigarette ads resulted in more favorable thoughts about the teenage smoker. Pechmann & Knight (cited in Pechmann, in press) found that just one anti-smoking advertisement was able to offset the impact of three cigarette advertisements, which would otherwise have enhanced perceptions of a teenage smoker's social stature, poise, popularity and vitality.

It seems conceptually plausible that anti-smoking advertising and cigarette advertising might compete with one another for the attention of potential and existing smokers. Saffer & Chaloupka (1999) and Levy & Friend (2000) discuss advertising response functions in attempting to portray the critical points where advertising is most effective, where additional exposures are subject to diminishing marginal returns, and how these thresholds might be modified by other influences. Advertising response functions suggest that advertising has very little effect until it reaches a certain critical level of exposure, or threshold, after which there are large pay-offs for increasing investment in the campaign (Rao & Miller, 1975; Ackoff & Ernshoff, 1975). This is consistent with the

point made by Pechmann (1997, p.195) that anti-smoking ads must have "adequate 'share of voice' to break through ad clutter, attract attention and persuade".

Saffer and Chaloupka (1999) and Levy & Friend (2000) posit that the ratio of cigarette advertising to anti-smoking advertising changes the relative effectiveness of each. Thus, cigarette advertising may increase the threshold of anti-smoking messages required to effectively influence smoking behavior. In addition, there is evidence that tobacco companies increase their marketing efforts, at least at the point of sale, in states where comprehensive tobacco control programs exist (Slater et al, unpublished), in an attempt to offset the effects of the anti-smoking campaign. Thus, the two may be in a dynamic relationship, and are not independent from each other.

Portrayal of smoking in movies, television programs, magazines and music media

Teenagers are three times more likely than adults to be frequent movie-goers (Terre et al., 1991). It is estimated that the average teenager goes to the movies approximately once each month and watches two feature movies per week on television or videotape (Veronis et al., 1996). In addition, adolescents are avid consumers of magazines, which carry both cigarette advertising and fashion images depicting smoking.

Portrayals of smoking in popular films occur with much more frequency than expected on the basis of smoking prevalence (Hazan & Glantz, 1995; Stockwell & Glantz, 1997). The rate at which tobacco appears per minute of film reached a minimum during the

1980's and increased during the 1990's to rates comparable to those observed in the 1960's (Stockwell & Glantz, 1997). Of a random sample of the top 20 highest grossing films each year from 1990-1996, an average of 5 minutes per film involved a tobacco-related incident (including implied or actual consumption of tobacco, tobacco paraphernalia, talking about tobacco, and discussion about the dangers of tobacco use), of which only 43 seconds involved an anti-smoking message (Stockwell & Glantz, 1997). Tobacco use occurred in two-thirds of children's G-rated animated films from 1937 through 1997, and in all such films released in 1996-97 (Goldstein et al., 1999). Several studies have found that smokers are depicted more positively than nonsmokers and that Hollywood's portrayal of smoking tends to ignore the negative consequences and correlates of smoking (McIntosh et al., 1998; Stockwell & Glantz, 1997). A recent study found that movies aimed at young audiences were less likely to carry negative messages associated with tobacco use than were movies aimed made for mature audiences (Escamilla et al., 2000)

Although portrayal of tobacco in fictional television programs is less frequent, there is evidence that it was increasing during the early 1990's (Hazan & Glantz, 1995b) after a period of decline during the 1980's (Cruz & Wallack, 1986; Diener, 1993). Tobacco portrayal also occurs in music lyrics and music videos. One study of music videos broadcast on network television found tobacco use to be present in 12% of country music videos and 26% of those broadcast on MTV (DuRant et al., 1997). Furthermore, style and fashion magazines with high youth readership show models and personalities

smoking in their editorial pages, especially fashion spreads, and there is evidence that this practice has increased (Amos, 1992).

Tobacco portrayal in films has often been a form of 'product placement' commonly used by commercial marketers to promote brands (Wasko et al., 1993; Russell, 1998). This can occur in television programs, radio shows, music videos, magazines, video games, plays, songs and even novels. As Hadju (1988) estimated, movies in the 1980's contained, on average, 30-40 minutes of screen time involving product promotions, translating into approximately one-third of a typical movie. Product placement can assist in offsetting the costs of film-making and distribution and can be a highly efficient way for advertisers to associate a product with desired qualities and situations (Wasko et al, 1993). An additional motivation for tobacco companies to use films has occurred as other avenues for positioning their products become unavailable through tighter government controls on tobacco advertising and promotion (Chapman & Davis, 1997). Although the Tobacco Institute claims that payments for specific brand placements ended in 1990 (Colford, 1990), the frequency of smoking in movies has dramatically increased since then (Stockwell & Glantz, 1997). In late 1997, California Senator John Burton held hearings on the use of tobacco in films (Vanzi, 1997) and Vice President Al Gore convened a meeting of entertainment leaders to discuss smoking in the movies (US Newswire, 1997). Soon after, the Entertainment Industries Council (EIC) launched an initiative aimed at reducing the gratuitous use of tobacco in films (Madigan, 1997). Interviews undertaken in the Spring of 1998 with a range of film actors, directors, producers and writers showed surprisingly little awareness of product placement and poor

awareness of the EIC initiative, but highlighted the use of smoking to elucidate aspects of a character and the role of actor's own smoking status as a determinant of smoking on film (Shields et al, 1999). Irrespective of whether sophisticated product placement of cigarettes continues, filmmakers are likely to make autonomous decisions to include portrayal of smoking in movies for reasons of 'artistic licence'.

The depiction of smoking in movies has been argued by some as a possible reason for increased smoking initiation among adolescents in the 1990's. Some argue that popular films should be considered as important as parents and teachers as models of values, beliefs and behaviors (Terre et al., 1991). Distefan and colleagues (1999) argue that movie stars have the potential to be even more powerful role models than parents and teachers because of the high visibility of their behavior on and off screen and their larger-than-life status.

When smoking is portrayed as normative, teenagers are more likely to overestimate smoking prevalence, which may increase their predisposition for taking up smoking. A recent study found that having a favorite movie star who smokes on and off screen is associated among teens with susceptibility to become a smoker (Distefan et al., 1999).

All of the research undertaken so far about the way in which tobacco is portrayed in movies has focused on quantitative assessment, such as minutes of exposure to tobacco images (Stockwell & Glantz, 1997), and adult perceptions and ratings of movie images and scenes involving tobacco (Goldstein et al., 1997; Stockwell & Glantz, 1997;

McIntosh et al., 1998; Escamilla et al., 2000). An important step in understanding the influence that smoking in movies may have on teens is to explore how teenagers perceive and appraise portrayal of tobacco in movies. As Chapman & Davis (1997) explain, the appearance of a cigarette in a movie "does not have one or even a small number of fixed meanings that can be unproblematically lifted into any context to produce the same meaning for any audience. Rather, depending on context and character, cigarettes can be used to signify a wide range of meanings, some of which might actually promote *negative* associations with smoking." Thus, it is important to determine what kind of messages teens take away from movies about tobacco.

Pechmann and Shih (1999) have undertaken what appears to be the only experimental study to date that has assessed how on-screen smoking might influence young viewers. These investigators compared the responses of ninth graders to movies with smoking scenes left intact with those where the scenes were professionally edited out. Compared to nonsmoking scenes, smoking scenes positively aroused young viewers (as measured on a 7-point scale from 'boring' to 'exciting'), enhanced their perceptions of smoker's social stature, and increased their intent to smoke. However, showing teenagers an anti-smoking advertisement before the movie nullified these effects. Viewing a movie with the smoking scenes professionally edited out did not change viewer's liking of the movie.

Amos and colleagues (Amos, 1992; Gray et al., 1996; Gray et al., 1997; Amos et al., 1998) have undertaken research examining the impact of cigarette imagery in fashion magazine pictures. They found that inclusion of a cigarette influenced how pictures were

rated by teenagers, and by smokers and nonsmokers (Amos et al., 1998). Smoking images were rated as more 'druggy', wild and depressed, and nonsmoking images as more healthy, rich, nice, fashionable, slim and attractive. However, smokers and nonsmokers rated themselves in the same way as they differentiated between smokers and nonsmokers in the photographs, so that for smokers, smoking-related attributes were considered desirable. This effect was strongest for males aged 15-16, than for females or younger and older adolescents. The magazine image studies emphasize that perception varies with observer characteristics. In addition, what a cigarette signifies was found to vary considerably in different images, depending on the prominence of the cigarette, presence of other cues such as types of clothes and background, and the 'strength' of the image (Gray et al., 1997; Amos et al., 1998).

Apart from this magazine research, there has been no work to investigate the mediating role of viewer characteristics in determining differential viewer effects in electronic and print media images. As pointed out by Solomon & Englis (1994), since movie or television audiences do not identify these forms of entertainment as persuasive communications, product placements are not identified as commercial messages. This means that images about smoking may not generate counter-arguments as they might for advertising messages, so that the persuasive impact of the communication may be enhanced. Further research in this area is needed.

News coverage on smoking

Television and radio are the media to which most teenagers are exposed, but newspapers frequently set the agenda for what is reported later in the day on television, so that the synergy between print and electronic news is important, and newspapers serve as an accessible proxy for all news reporting.

While news coverage would be unlikely to directly influence teenage tobacco use, there is good reason to expect that it may have an indirect influence, by setting the agenda for discussions about tobacco among parents, older siblings and friends, in schools and in other community activities. The news media has enormous influence over the way in which issues are presented for consideration by the public. If it were possible to quantify all news media coverage of tobacco, it would almost certainly be the case that in aggregate, this coverage would routinely eclipse even the most intensive coverage gained through formal counteradvertising campaigns (Stevens, 1998; Chapman, 1999). Some of the most potent examples of news media reporting have been highly memorable – for example, presidential candidate Bob Dole's foot-in-mouth saga over tobacco policy (Davis, 1996), the tobacco industry testifying before a congressional subcommittee that tobacco is not addictive, and Sixty Minutes coverage of Jeffrey Wigand's story (which was eventually made into the film "The Insider"). Some of the news coverage material is planned as part of a media advocacy strategy to support anti-smoking media campaigns and/or the passage of tobacco control legislation (Wallack, 1994; Stevens, 1998). News reports that bring attention to or complement an anti-smoking campaign may act to increase interpersonal discussion about relevant issues, which can provide additional benefit.

There have been two community trials involving elements of media advocacy about tobacco within the context of a broader set of strategies designed to influence youth smoking. Both of these, the Midwestern Prevention Project (Johnson et al., 1990; MacKinnon et al., 1991; Pentz et al 1989a; 1989b) and Project Sixteen (Biglan et al., 2000), are summarized in Table 2. The design of these intervention studies did not permit disaggregation of the effects of the media component from other intervention elements.

News coverage may have an influence not only because of the frequency of reporting about tobacco issues, but through framing stories in particular ways. "Framing" refers to the context in which a story is presented – elements such as the background, tone and slant of the article. This is important because it is known that people are highly sensitive to contextual cues when they make decisions, formulate judgements or express opinions (Iyengar, 1991). Framing of the way in which news stories are crafted to define the problem of tobacco not only suggests to policy-makers and the public why tobacco is important, but suggests appropriate solutions to the tobacco problem. In this way, the media not only tells people what issues to think about in relation to tobacco control, but how to think about them (Menasche & Siegel, 1998). For example, an analysis of newspaper coverage of the tobacco settlement in the front section of the Washington Post found that tobacco was framed as a 'youth issue' in 55% of articles, but as a deadly product in none of the articles (Lima & Siegel, 1999).

There is some evidence from other fields that media portrayal influences public perceptions. Using time series analysis, Fan (1996) showed that change in public perception of drugs being the most important problem facing the United States (from 5% in 1985 to 60% in 1994) was explained by increases in the news media describing drugs as 'a crisis', whereas other types of discussion about drugs contributed negligibly. In the reverse direction, public opinion about drugs was a weak but significant contributor to press coverage. In addition, there has been other work that has linked news coverage about crime and violence to inaccurate beliefs about violence, attitudes about criminal sentencing, fears of personal safety and satisfaction with law enforcement (Gerbner et al., 1980; Roberts & Doob, 1990; Graber, 1980).

The way in which the media frame issues for public consumption may also influence behavior. At least short-term changes in self-reported crack and cocaine use by 12th graders was observed following extensive news coverage of two star athletes who died after using crack cocaine in the mid 1980's (Fan & Holway, 1994). News coverage about binge drinking was found to be related to teen disapproval of binge drinking and decline in binge drinking behavior from 1978 to 1996 (Yanovitsky& Stryker, 2000). Laugesen & Meads (1991) in New Zealand showed that cigarette consumption, measured by weekly purchases of tobacco from a selected number of tobacco outlets, was significantly related to the weekly number of news stories about tobacco, although the effect was short-liv5 ed. They estimated that a doubling of news coverage had approximately the same impact as a 10% increase in price. To date, apart from the work involved in the ASSIST evaluation, there has been relatively little work which has sought to systematically

monitor the amount and type of news stories about tobacco despite this being called for (Wakefield & Chaloupka, 1998; Chapman, 1999), and no studies have assessed how news coverage might influence teenage smoking-related beliefs, attitudes and behavior. This is an area that is ripe for further research.

The tobacco industry is highly successful in creating 'controversy' about tobacco issues through effective use, and perhaps manipulation, of news media. News coverage about tobacco has been found to differ in Australian newspapers (Chapman, 1984; 1989) and in newspapers for schools in the United States (Balbach & Glantz, 1995; DeJong, 1997), according to whether the newspaper is owned by individuals or groups associated with tobacco companies, with fewer tobacco control stories likely to be published. Similarly, magazine acceptance of cigarette advertising appears to influence the likelihood of whether magazines will run articles about the risks of smoking (Amos et al., 1991; Warner, 1985) and whether articles about passive smoking label the research as 'controversial' (Kennedy & Bero, 1999). Tobacco company internal documents reveal well-orchestrated disinformation campaigns, often using industry 'front groups' to cast doubt on the findings of scientific reports about passive smoking (Ong & Glantz, 2000). There is relatively little research that has attempted to link to what extent youth perceive that there is 'controversy' about such issues, and explores what this might do to their perceptions about risk, and ultimately, their likelihood of taking up smoking. However, the literature is clear that both youth and adults do not really understand the risks, and underestimate the addictiveness, of smoking (Slovic, 1998; Weinstein 1999; Slovic, 1999; Slovic, in press), so that misinformation will be likely to further confound risk

perceptions. Additional study of information that could potentially cause youth to maintain, or further underestimate the risk of smoking and passive smoking, and how this might translate into changes in the likelihood of smoking uptake, is needed.

Theoretical approaches to understanding media influence

The consequences of media dissemination of images, ideas, themes and stories are commonly discussed under the rubric of media effects. Media effects research encompasses the study of how the media influences knowledge, opinion, attitudes and behavior among individuals, groups, institutions and communities, and also examines effects flowing in the opposite direction – from audiences to media. This research framework regards audiences as active seekers and users of information, rather than passive recipients. Because of their relevance to public health efforts to guide social and behavioral change, this section first considers four media effects perspectives: knowledge gap, agenda setting, cultivation studies, and risk communication.

Four general theoretical perspectives on media effects

The knowledge gap hypothesis proposes that an increasing flow of information into a social system (from a campaign, for example) is more likely to benefit groups of higher socio-economic status (SES) than those of lower SES (Tichenor et al., 1970). This conceptual framework was important because it emphasized that media have a differential influence on audiences that may be moderated by social and environmental

factors. While early work provided support for the general contention, subsequent studies found that knowledge gaps were not intractable and could be minimized by using different channels of communication via groups and institutions, and tailoring message content (Finnegan & Viswanath, 1996).

Another field of media effects research has been concerned with the mass media's role and influence in setting the public agenda of important problems and issues. An axiom of this approach is that mass media may not be so successful in telling us *what* to think, but they are very effective in telling us what to think *about*. Kosicki (1993) suggest that there are three streams of agenda-setting research: public agenda-setting, which examines the link between media portrayal of issues and priorities as assigned by the public; policy agenda-setting, which explores the connection between media coverage and the legislative agenda of policy-making bodies; and media agenda-setting, which focuses on factors that influence the media to cover certain issues. More recent refinements within agenda-setting theory have encompassed the notion that mass media *do* have a significant impact on *what* we think. This line of enquiry stems from the field of semiotics, or the science of symbols, signs and codes and the meanings they convey in a variety of social contexts. As early as 1959, Levy (1959) proposed that people buy products for what they mean as well as for what they do. According to this more recently incorporated view (Finnegan & Viswanath, 1996), the media provide ways of thinking about specific issues by the signs and symbols used to define the issues – thus, health and social problems are social constructions, defined symbolically through media images and messages, and built by various community groups, institutions and advocates. The context of a television

program or movie, for example, can provide a social context for a particular product (such as a cigarette), and the product, in turn, adds to the social and cultural atmosphere of the program. Much of the linkage between the movie or television program and the product is non-conscious and affective transfer from the program to the product is hypothesized to occur (Russell, 1998).

Russell (1998) hypothesizes that the construct of 'audience connectedness' defines intense relationships between the audience and a television program that extend beyond the television watching experience into individuals' personal and social lives. Highly connected audiences are more susceptible to the consumption images presented in the television programs, so that the degree of connectedness moderates the effectiveness of product placement efforts (Russell, 1998). Although highly connected audiences are influenced by the products portrayed in 'their' show, they do not necessarily perceive the commercial intent of the technique. Russell (1998) further suggests that each individual-program relationship can be conceived as being on a continuum from no involvement to fanaticism (Russell & Puto, 1999. Understanding and evaluating these differences may be crucial in assessing the true impact of advertising and other media based marketing efforts, such as product placements (Russell, 1998).

A third perspective, cultivation theory, is concerned with the impact that mass media may have on perceptions of 'reality'. Gerbner's cultivation theory is based on the premise that television images cultivate dominant tendencies of a culture's beliefs and ideologies. Cultivation theory suggests that cumulative exposure to particular media messages is

likely to encourage the audience to develop a consonant world view (Gerbner et al., 1980). In cultivation theory, the amount of viewing is considered to be a primary variable in television's impact on behavior. Heavy television viewers are less selective in their viewing, engage in habitual viewing, and experience a good deal of sameness of content. According to cultivation theory, general concepts of social reality develop in heavy television viewers. Thus, for example, heavy television viewers, since they are exposed to more television violence, significantly overestimate the prevalence of violence in society. Light viewers are more likely to have many other sources of information that take up time and displace television viewing time.

One of the criticisms of cultivation theory is that it conceptualizes television exposure at the general level and does not discriminate between different types of programs (Potter, 1993; Rubin et al., 1988). Another criticism is that the direction of causality is unclear – although heavy viewers may develop a particular perception of the world, this perception may also determine their viewing habits and behaviors. Finally, there has only been limited empirical application of the theory, with mixed results (Van Evra, 1998).

In contrast to cultivation theory which places emphasis on television content, uses and gratifications theory is concerned with the actual motivations of viewers, the uses they make of television, and the needs they have that might be satisfied by the media (Rubin, 1993). Thus, it looks at what people do with the media, rather than what the media do to them. According to uses and gratifications theory, there are four main uses of the media: to obtain information and knowledge; for diversion (including stimulation, relaxation or

emotional release); for social integration (including overcoming loneliness, or allowing parasocial relationships with television characters); and for withdrawal (to provide a barrier or avoid chores) (Finnegan & Viswanath, 1996). In this model, the audience selects and uses content that will best meet their needs, and the same program may gratify needs in different audience members. There is distinction between instrumental and ritualistic viewing. Instrumental viewing refers to a goal directed use of the media, where there is greater involvement. Ritualized viewing is more frequent and nonselective.

Uses and gratifications theory has been criticized by some for its assumption that use of the media is voluntary and it does not recognize that users do not always have a choice about what is viewed (Kubey & Csikszentmihalyi, 1990). Furthermore, viewers may have many different needs at the same time, which may be satisfied by a wide range of programs (Van Evra, 1998).

Developmental level is also important in a uses and gratifications approach – it influences not only the media choices that are made, but also how people interpret media content. According to primary socialization theory, television can be instrumental in helping with resolution of the developmental tasks of adolescence by providing direct learning, as a coping mechanism, for stimulating fantasies, or interpersonal discussion of options (Kelly & Donohew, 1999). Arnett (1995) proposes that media is a secondary factor in the socialization process of adolescents, but may be a primary factor in cases where the traditional primary factors are lacking, such as parents, siblings, and peers. In general, teenagers have much greater control over their media choices than over socialization

from parents, their school and their community. This results in more self-socialization and potentially a lack of integration in adolescent socialization as they receive conflicting messages from different sources. The theory suggests that the primary socialization process influences the effects of media through selection (choices of media and program types), selective perception (how media messages are interpreted), and exposure norming (interaction with primary socialization sources after exposure can change interpretation of media messages) (Kelly & Donohew, 1999). It may well be that the media is more influential now than even 10 years ago, due to lower parental involvement with children.

Van Evra's (1998) integrative model of media effects suggests different media effects depending upon use of media (information vs diversion); perceived reality (real vs unreal); amount of viewing (heavy vs light) and information alternatives (few vs many). Thus, a maximum effect might be expected when viewing for information, where the content is perceived as real, there is a heavy viewing pattern, and there are few information alternatives. Van Evra (1998) also posits that developmental level, race, gender and other factors determine use made of television, reality perceived, amount viewed and information alternatives. Thus, there is a complex interaction of viewer characteristics, use and amount of viewing, perceived reality and information alternatives that are proposed to mediate effects.

A fourth media effects research perspective is that of risk communication. At the individual level, researchers emphasize the cognitive mechanisms by which individuals are attend to and interpret information about risk, and whether and how this influences

their behavior (Slovic et al., 1981; Weinstein, 1984). Theoretical bases for this research stems from the Health Belief Model, the Theory of Reasoned Action (for example, perception of personal risk susceptibility to and severity of smoking-related illness) and social cognitive theory (for example, self-efficacy for quitting smoking) (Finnegan & Viswanath, 1996). At the community level, risk communication studies focus upon the interaction of populations and social institutions in the formulation and management of public opinion and policy making about risk. The theoretical basis for this field of study is from borrowed the agenda-setting perspective and also from research into the definition and framing of public issues.

In the public health literature, it is accepted that conceptually, the media does more than directly educate its audience. Mass media can also support (reinforce old messages, support health changes, encourage maintenance of health changes or keep public health issues on the agenda), promote (publicize products and services) and play a supplementary role by being part of a larger and complimentary community-based program of tobacco control activity (Flora et al, 1989). Theory suggests that mass media are more effective if they stimulate interpersonal communication (Flay & Sobel, 1983; Flay, 1987; Rogers & Storey, 1987). Thus mass-media campaigns that stimulate interpersonal communication and contribute to mobilizing social support for behavior change may improve the likelihood of behavioral effects. In mass media research, opinion leaders have been assumed to play an important role in receiving, interpreting and communicating messages to those around them (Katz, 1957). Thus, although media may assist the dissemination of new information, interpersonal discussion is instrumental

in persuading people to make changes to behavior. Mass media campaigns can also stimulate purposive information seeking.

In summary, these differing perspectives on media effects emphasize that individuals vary in the way they watch television and use other forms of media. Because of this, and due to other differences between audiences, different individuals perceive different messages as being salient within the same communication or set of communications. In addition, interpersonal factors can mediate the messages received and interpreted from media sources.

Theoretical perspectives relevant to persuasive communication

The study of advertising has predominantly been influenced by theories from social psychology (Thorson, 1996). Early models, which focused on processes within the individual, were labeled hierarchies of effect (Lavidge & Steiner, 1961; McGuire, 1978; Preston, 1982) and suggested that consumers process information from advertisements through an ordered series of stages. For example, McGuire (1985) suggests that, in order to be influenced by a message, the audience must be exposed to the message, pay attention to and understand the message, and develop a cognitive or affective response to the message. These types of models assume that failure at any of the steps will lead to no response to the advertising, and that attitudes and behaviors in response to advertising are developed consciously and rationally (Thorson, 1996).

In the 1970's, an influential model of advertisement processing was the Fishbein & Ajzen (1975) multiattribute model. This attitude-based model suggested that a consumer's attitude toward any brand or service is determined by summing the consumer's evaluative response toward each individual product attribute, multiplied by a subjective estimate of the probability that the brand in question actually possesses the attribute. According to this model, an ad changes brand attitude either by changing a person's perception of the probability that a brand has some attribute, or by changing a person's evaluative beliefs about the attribute. Another group of models influential at this time focused on the influence of advertising on memory (Srull, 1983; 1984), laying a foundation for the use of memory by advertising practitioners as an index of the effectiveness of advertising.

Since the early 1980's however, the advertising research literature has been influenced by thinking about the level of involvement with advertising. Various models conceptualize involvement in slightly different ways, as central rather than peripheral processing (Petty & Cacioppo, 1986), systematic rather than peripheral processing (Chaiken, 1980) or brand rather than non-brand processing (Gardner et al., 1985). A dominant model, the elaboration likelihood model (ELM), is a dual-process model of attitude change (Petty & Cacioppo, 1986), which has implications for persuasive communications, such as advertising. The ELM suggests that attitude change can be either central route (based on effortful information processing activity aimed at uncovering the central merits of an issue) or peripheral route (based on low effort attitude change processes). The route used depends upon level of motivation and ability to assess central merits of a message. Thus, when motivation or ability to process a message is low, attitudes are more likely to be

changed by relatively simple associations, such as classical conditioning or heuristics retrieved from memory. Attitudes formed via this route are hypothesized to be less enduring and less likely to lead to long term behavior change.

As shown by Petty et al. (1986) people exposed under low involvement conditions agree with a message more if there are more arguments, while people under high involvement conditions agree with a message more if the arguments are more compelling. Thus, at the low end of the elaboration continuum, it is the quantity of cues that affects the degree of persuasion, while at the high end of the continuum, it is the quality of the argument that affects the amount of persuasion.

There are also affective models of advertising reception. Some of these assume that emotion operates indirectly on brand attitudes via attitude toward the advertisement (Edell & Burke, 1987; MacKenzie et al., 1986). Others suggest that emotion becomes associated through conditioning with other elements in the advertisement, including memory for the whole advertisement and attitude toward the brand. Srull (1983) suggests that when consumers are asked to evaluate brands as they process ads, moods induced by the ads affect brand attitudes via mood state association. Previous research has shown a confident memory advantage exists for negative messages (Reeves et al, 1991) and that inducing negative mood in the target group increases the likelihood of central processing of information (Eagly & Chaiken, 1993). This framework has implications for the line of research that seeks to investigate appraisal of ‘types’ of anti-smoking ads, as discussed later.

Conclusions

Overall, it can be seen that in the public health literature, the alignment between theory and empirical studies has generally been poor. This is probably due to the fact that much of the empirical literature is sourced from researchers who do not have a background that spans consumer processing, psychology and advertising, and are unfamiliar with the literature. However, much of the progress in implementing planned statewide anti-smoking campaigns has only been made in the past decade, following a previous decade of progress focused on school and community interventions. At least in the case of government funded anti-smoking campaigns, those who would evaluate campaign messages have only a small influence over the selection, development, and placement of anti-smoking advertising, and theory testing takes a firm second place to determining whether the campaign is having an impact on population smoking prevalence, by way of meeting the demands of public accountability for campaign expenditure. Nevertheless, population monitoring researchers in California and Massachusetts have made excellent use of their data to investigate media influences, such as tobacco marketing and anti-smoking advertising, on youth. However, understanding anti-smoking messages that are more or less effective with youth has received mixed informed attention and more research is required, although high emotional arousal does appear to be an important ingredient. Economists have also played an important role in comparative studies of the influence of tobacco advertising across countries and over time. Analysis of news media about tobacco issues is in its infancy and much remains to be learned (Chapman, 1999). Most of the published research that has studied placement of tobacco messages in

television programs and movies has been virtually theory-free, and this field is ripe for further investigation, perhaps along the lines proposed by Russell (1998).

Pathways of media influence

Although this paper has for the most part separately discussed different types of media in relation to youth smoking, it is a truism that teenagers are exposed to all of these types of media and that the entire media environment needs to be considered. It is possible that consistent messages about tobacco from different media channels may have an amplified effect on youth smoking, rather than being purely additive. While there is much to be learnt, there is nevertheless much that we already know about the role of the media in influencing youth smoking. Considering the theoretical perspectives on media effects and the empirical evidence base for the influence of the media on youth smoking, we draw the following conclusions about pathways by which advertising (both pro and anti-smoking), product placement in media, and news coverage about smoking might influence youth smoking.

First, it seems that media both shape and reflect social values about smoking. The emergence of anti-smoking campaigns has occurred because governments believe that the public requires adequate information, additional motivation, and accessible assistance to quit smoking or not to start smoking. In turn, campaigns are a very visible reminder to the public about the undesirability of smoking. The extent and framing of news reporting

about smoking issues can also be clearly seen as both a reflection of, and reinforcer for, community beliefs and attitudes about smoking and tobacco companies.

Secondly, media provide information about smoking directly to audiences. Cigarette advertising alerts consumers to new brands on the marketplace. Anti-smoking advertising provides insights about previously little-known health risks of smoking and publicizes the availability of smoking cessation services. Pharmaceutical company advertising lets smokers know about the availability of new medications, such as nicotine replacement therapy and buproprion, to assist with cessation. News reports publicize new laws and policies applying to smoking.

Third, the media act as a source of observational learning by providing models which teenagers may seek to emulate. Thus, cigarette ads use glamorous women (Virginia Slims), tough men (Marlboro) and friendly fun-loving cartoon characters (Camel) to build a brand image that might appeal to potential customers. Television programs and movies portray particular lifestyles and issues, which may be highly involving to teenagers, so that product placements, or even incidental use, of tobacco in these contexts may be highly appealing. These factors may be important in mediating the perceived prevalence of smoking, a factor that is strongly linked to increased risk of smoking uptake among teenagers. On the other side of the equation, anti-smoking advertising may significantly reduce perceived smoking prevalence among teenagers and affect other normative influences, like the acceptability of smoking in indoor public places.

Exposure to media messages about smoking also provides direct reinforcement for smoking or not smoking. Thus, exposure to cigarette advertising and promotions may act as a cue for a smoker to have a cigarette, or may even prompt a relapse among someone who is in the process of quitting. Exposure to anti-smoking advertising may reinforce nonsmoking in a person who has recently quit, or can reinforce an intention not to smoke in future.

A considerable body of theory and empirical research suggests that media promotes interpersonal discussion about smoking, which in turn affects ultimate impact on attitudes and behavior. Thus, the views and behaviors of peers, parents and close friends may moderate media messages about smoking. It would be possible in principle to examine interaction effects between baseline characteristics and cigarette advertising recall and appraisal, to determine whether, for example, very high levels of peer influence increase the likelihood of cigarette advertising precipitating experimentation with smoking and/or more rapid progression towards regular smoking. Alternatively, there may be protective effects offered by clear parental disapproval of smoking, especially for teenagers at particular ages, so that cigarette advertising is less appealing – in effect, so that there is interruption of the positive imagery the ads attempt to portray. In contrast, having peers who are smokers may 'undo' any potential protective effects of anti-smoking advertising.

Related to this, media can also influence other 'intervening' behaviors that may make teenage smoking less likely. For example, anti-smoking advertising, by making the

undesirability of smoking more salient, may reduce adults' and older siblings' or friends' willingness to supply cigarettes to younger teenagers. In addition, such advertising may encourage more parental disapproval of smoking, which, in turn, may reduce the likelihood of smoking uptake by teenagers.

At a more macro level, anti-smoking media messages can also set the agenda for other change at the community, state or national level. Making the health effects of smoking and passive smoking more salient may garner support among the public and policy-makers for other tobacco control policies, such as cigarette price increases, restrictions on smoking in public places and on tobacco advertising and promotions, and more aggressive enforcement of youth access laws. Each of these may have independent effects on smoking, and may interact with anti-smoking advertising to influence youth smoking.

Any influence exerted by the media on youth smoking interacts with a range of other individual, family, peer, and community-level factors. Clearly the family is important, because this is the context in which rules about, and habitual patterns of, media usage are mostly established. Parents may impose limits on how much and what type of programs on television their children might watch, they may make rules about whether their children may view movies classified for older viewers, and they may disapprove of their children owning cigarette promotional items. They, and perhaps older siblings, may be avid consumers of newspapers and magazines, thereby facilitating access by youth to news stories about tobacco, and/or magazine advertisements for cigarettes. Thus, parents

may be active mediators of youth exposure to messages about smoking. In families with heavy television and movie viewing habits, they may be more likely to perceive smoking as normative (Gerbner et al., 1980).

The family is also likely to moderate the way in which media messages are received and appraised. For example, some parents may actively seek to engage their children in discussion about anti-smoking advertising, as well as television programs and movies, and newsworthy events and issues that may involve tobacco. Parental and sibling smoking behavior and attitudes to smoking may influence the processing of media messages about smoking. As previously alluded to, strong parental disapproval of smoking may confer a protective effect on youth, by raising the threshold of influence from exposure to cigarette advertising and promotions. Alternatively, permissive parental and sibling attitudes about smoking may lower this threshold and/or may raise the threshold of influence from exposure to anti-smoking advertising. If parents or siblings smoke, the availability of cigarettes in the household may facilitate youth acting on temptations to try a cigarette, perhaps after having watched a movie where a favorite move star smokes.

Peer influence is also likely to be an important moderator of media effects. To the extent that persuasive media messages may elicit discussion, those with whom a youth discusses what was seen, will likely have an important effect on eventual appraisal of the message. Thus, if many close friends are experimenting with or are already regular smokers and

discount anti-smoking advertising, all other things being equal, the child may be more likely to also discount the advertising message.

There are also likely to be cultural differences in consumption of different types of media. For example, teenagers in Finland are much more likely to read the newspaper than American teenagers and tend to use media in general for informational purposes rather than entertainment purposes, the prime concern of American teens (Burton et al, 1990). African Americans spend more time watching television than Whites, but patterns of use by Hispanics have only recently become a subject of study (Romer & Kim, 1995). Cultural differences in identification with different smoking-related media messages are also likely, and help to explain the positioning of different cigarette brands for different racial and ethnic groups.

School-based smoking prevention programs can improve the likelihood that anti-smoking advertising or community-based activities that include news media advocacy about tobacco can reduce the uptake of smoking, and that effects seem more robust when exposure occurs during pre-teen or early teenage years, as opposed to later ages. This may be due to a range of factors, such as developmental age, and likelihood of already having experimented with smoking, as discussed previously.

Tobacco policy is clearly linked to the extent to which media messages about smoking may be influential. There is evidence that increases in tobacco tax and media anti-smoking campaigns may operate at least in an additive, if not synergistic way, to reduce

tobacco consumption. Strong tobacco control laws may assist youth to perceive smoking as non-normative, and may reduce the pervasiveness of tobacco advertising and promotional messages. The extent to which cigarette advertising is permitted through state or local laws may also influence the effectiveness of anti-smoking advertising.

Areas for further research

On the basis of the preceding discussion, the following research areas are emphasized as priorities for further study.

a. Is there an age or developmental stage window of optimum influence for tobacco advertising and marketing on smoking uptake and does this vary by other important personal characteristics such as gender, race/ethnicity, smoking intentions and past smoking experience? To what extent do family and peer relationships and smoking habits mediate receptivity to tobacco advertising and marketing strategies? Studies that use a longitudinal approach with regular follow-up from pre-adolescence to late adolescence are required to better assess the temporal relationship between tobacco advertising and marketing exposure and smoking outcome, exploring whether there are differential effects by baseline characteristics. This research might, for example, be able to identify constellations of baseline characteristics that interact with a critical level of advertising and marketing exposure to result in a rapid uptake trajectory. In contrast, it may be possible to identify factors that may protect against such a trajectory. This kind of research should also include a focus upon advertising for

specific brands and look for changes in uptake of those brands by gender and race/ethnicity.

b. A similar series of questions can be asked about the differential influence of anti-smoking advertising and a longitudinal design with multiple follow-up would again be informative. This research could also examine the effect of 'competing' exposures of anti-smoking advertising and tobacco advertising and marketing on youth smoking uptake, to determine under what circumstances and for which individuals, anti-smoking advertising could have most beneficial impact. Also, are there teen smokers who may perceive that anti-smoking messages do not apply to them because they do not label themselves as smokers, or consider their level of smoking unlikely to be harmful?

c. What strategies are used by the tobacco industry to offset the potential effects of anti-smoking campaigns and other tobacco control strategies? For example, is there evidence of more intensive advertising and marketing efforts in states with ongoing anti-smoking campaigns? Is there evidence of industry involvement in disseminating misinformation through news reports and the like? Monitoring of marketing efforts, news reports, and key informant interviews in a sample of communities in states with and without ongoing anti-smoking campaigns could assist in pursing this research agenda.

d. What characteristics of anti-smoking advertisements most lead teenagers to seriously stop and think or engage in discussion about smoking? And what characteristics of ads are associated with low levels of cognitive engagement or interpersonal communication? What kind of influence do ads primarily aimed at adults have on teens? For example, do ads promoting nicotine replacement therapy have an unintended effect on teens in giving a message that quitting is easier than it actually is? Additional audience studies which test a wide range of advertising themes as well as executional styles are required.

e. What strength and configuration of anti-smoking advertising efforts might best reduce youth smoking? To what extent do other tobacco control policies interact with anti-smoking efforts, once variation in tobacco advertising and marketing is controlled? Is there a multiplicative or additive relationship between anti-smoking advertising and other tobacco control policies in effects on youth smoking, or are there thresholds involved for optimum effect? Can teen-directed anti-smoking advertising have an impact on youth smoking in the absence of broader effects to change the normative environment for smoking through advertising aimed at reducing smoking among adults? A multi-level analysis could be informative in answering these questions. Such a design would use a nation-wide school-based sample of teenage respondents, onto which archival media market records of anti-smoking advertising are mapped, as well as state and local tobacco control policies and local observations of tobacco advertising and marketing activities.

f. How do teenagers appraise the range of youth smoking prevention efforts presently being undertaken by tobacco companies? When compared with state and national funded anti-smoking advertisements, how do tobacco company youth prevention ads rate? What effects do tobacco company promotional efforts to portray themselves as good corporate citizens, such as those by the Philip Morris group of companies, have on teenage perceptions of the tobacco industry in general and their views about tobacco in particular? Monitoring of youth awareness and appraisal of such advertising and other efforts could be informative in this regard.

g. Given that restrictions on tobacco advertising are becoming more common, and that it is known that companies respond to restrictions by using other marketing strategies, what new marketing strategies are emerging which may influence teenagers? A monitoring system involving routine point-of-purchase observation and scanning of magazines and other media outlets, or one that used volunteer smokers to alert tobacco control advocates to newly encountered marketing efforts could provide early warning of new strategies and raise the need for an assessment of their attractiveness to youth.

h. How do teenagers perceive the different types of smoking portrayals that appear in movies and what messages do they take away from viewing? Importantly, what viewer characteristics might predispose teenagers to take away favorable impressions of smoking when it is portrayed as such in a movie setting? Are there measures that

can reliably be taken to nullify potentially favorable impressions, such as broadcasting anti-smoking ads prior to the movie?

i. What is the relationship between the extent and tone of news coverage on tobacco issues, whether this be through newspaper reports, magazine stories or electronic news, on teenager's smoking perceptions, intentions and behavior? Does favorable tobacco control news coverage amplify any effects of anti-smoking advertising on reducing youth smoking and conversely, does coverage unfavorable to tobacco control reduce effects?

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Table 1: Summary of experimental trials involving anti-smoking advertising and teenagers

Name of project	Nature of intervention	**Target group**	**Study design**	**Main Outcomes**
North Karelia, Finland (Vartiainen et al., 1986; 1990;1998)	C = No intervention; I1 = peer-led social influence school program +adult-focused mass media campaign + community activities; I2 = teacher-led social influence school program +adult-focused mass media campaign + community activities.	7th graders aged 12-13 years	Quasi-experimental design with matched schools in two counties, starting 1978	4 yr f.u: Smoking prevalence sig lower in I groups; 8 yr f.u: Smoking initiation lower in I group for baseline nonsmokers, no difference in quit rates for baseline smokers; 15 yr fu: as above.
Minnesota Health Health Program (Perry et al., 1992)	C = multicomponent school program I = as above, plus mass media on heart health, including smoking cessation	6th graders	Quasi-experimental design with matched schools in another state	3 yr fu: I students had sig lower smoking prevalence, but unable to separate effects of school program and media
Stanford Five City Project (Fortmann et al 1994; Winkelby et al., 1993)	C = No intervention I = media advocacy and some anti-smoking advertising aimed mainly at adults during 1980-1985	12-14 year olds	Quasi-experimental design with matched communities, cross sectional surveys	From 1979 to 1990, prevalence of daily smoking for 12-24 year olds did not differ in I and C communities
Vermont Study (Flynn et al., 1992; 1994; 1997; Secker-Walker et al., 1997; Worden et al., 1996; 1998; Worden & Flynn, 2000)	C = school program only I = school program + TV and radio anti-smoking ads broadcast for 5 months in year 1 and for one month in years 2-4, more messages targeted at high risk girls	5th-7th graders	Quasi-experimental design with two matched pairs of school communities	4 and 6yr f.u: I students had sig lower smoking status, past week smoking and daily smoking; Sig relative reduction in outcomes for high risk teens, especially girls
Southeastern US (Bauman et al., 1988; 1991)	I1 = radio anti-smoking ads I2 = as above, plus ad to encourage participation in non-smoking sweepstakes I3 = as above, plus TV ad to encourage participation in sweepstakes	12-14 year olds	Households surveys of teens in 3 non-overlapping media markets in SE USA, followed up at 2 years	No differences in smoking behavior at follow-up
Southern California (Flay et al., 1988; 1995)	C1 = no intervention C2 = health information only control I = social influences school program + television intervention	7th graders	Quasi-experimental design with student follow-up twice during 7th grade and once during each of 8th, 9th, and 10th grade	Strong immediate positive effects on mediator variables such as knowledge of smoking consequences, perceived smoking prevalence and efforts to resist trying cigarettes, partial decay at 2 yr fu, but still sig different; No sig effects on smokingbehavior
Midwestern Prevention Project (Johnson et al., 1990; MacKinnon et al., 1991; Pentz et al., 1989a; 1989b)	I = multi-component school and community program to resist illicit drug use, including reducing smoking, media component involved news coverage	Middle and junior high school students	Single group design using longitudinal follow-up at 1, 2 and 3 years	1, 2 and 3 yr fu: Reduced rates of past week and past month smoking; No control group, so difficult to attribute causation to media, although effect sizes almost double effects of school programs alone
Project Sixteen (Biglan et al., 2000)	C = school intervention I = school + community intervention, including	7th and 9th graders	Matched pairs of schools assigned to the	At completion of I and at 1 yr fu: I students had sig lower rates of past week

	paid anti-smoking ads on radio, newspaper articles and posters		2 conditions and followed up 5 times until one year after intervention	smoking
Norway (Hafstad et al., 1996; 1997; Hafstad & Aaro, 1997)	C = no intervention in county I = county has anti-smoking TV ad, cinema ad, newspaper ads and posters mailed to schools. Campaign aimed mainly at girls, emphasizing mismatch between being a smoker and independence, appearance and concern for environment	14-15 year olds	Two matched counties, using cohort of teenagers sampled from household survey, followed up at 6-12 months, 3 years	3 yr f.u: Sig reduction in odds of being a smoker for I group comp with C group for boys and girls; Reduction in odds of smoking for baseline smokers applied equally to males and females; Reduction in odds of smoking for baseline nonsmokers applied only to girls

C=Control; I=Intervention

Table 2: Summary of state tobacco control campaign approaches and reported effects on youth smoking

	California: 1989-	**Massachusetts: 1993-**	**Arizona:**	**Oregon**	**Florida**
Per capita program spending (in US 1999 dollars)	1989-1993: $3.27 1993-96: $1.78	1994-97: average $7.09 (Abt Associates, 1998)	1996-98: average $3.89 (Bialous & Glantz, 1999)	1997-99: $2.59 (Oregon Health Division, 1999)	1997: $2.61 1998: $4.73 (Givel & Glantz, 1999)
Program components	1989-1996 (average): Mass media 17% Local lead agency grants 26% Competitive grants 22% School-based programs 31% Administration and evaluation 5% (Pierce et al., 1998)	1996-97: Mass media 33% Local lead agency grants for cessation, education, advocacy 43% School programs 15% Statewide services eg. training and quitline 5% Research/evaluation 4% (Abt Associates, 1998)	1997-98: Mass media and sponsorships 54% Local lead agency grants for school education, cessation, protection from ETS 25% Info clearinghouse & quitline 5% Statewide projects, admin and evaluation 16% (Bialous & Glantz, 1999)	1997-99: Public awareness and education 27% Local lead agency grants 38% Statewide/regional projects for quitline, tribal programs 16% School programs 12% Coord/evaluation 7% (Oregon Health Division, 1999)	1998-99: Mass media 37% Education/training 23% Youth and community programs 21% Enforcement 12% Evaluation 6% (Givel & Glantz, 1999)
Program focus	Adults Teenagers Protection of nonsmokers from ETS	Adults Teenagers Protection of nonsmokers from ETS	Pre-teenagers Teenagers Pregnant women Adults from mid-1998	Adults Teenagers Protection of nonsmokers from ETS	Teenagers
Evaluation elements	Ongoing cross-sectional population surveys of adults and teens; Cohort study of teens; Tracking of per capita consumption.	Ongoing population surveys of adults and teens; Cohort studies of teens and adults; Tracking of per capita consumption.	Surveys of recall and appraisal of campaigns; Tracking of per capita consumption; Population surveys of teens and adults.	Standardized reports on placement of mass media, quitline calls; Tracking of per capita consumption; Surveys of adult and teen smoking	Teen & adult surveys to assess recall of campaign and beliefs and attitudes; School surveys to assess smoking behavior.
Mass media campaign recall and recognition	High levels of campaign awareness among adults and teenagers. (Pierce et al., 1998c; Popham et al., 1994; Howard-Pitney et al., 1998)	Increasing majority of adolescents have seen and heard campaign advertising and recognize campaign theme (Briton et al., 1997)	1998: 2/3 teens, pregnant women & adults reported seeing advertising in last 30 days (Eisenberg et al., 1998)	74% of adults and 84% of teens recall at least one campaign advertisement (Oregon Health Division, 1999)	Sept 1998: 28% teens reported seeing one ad each day, 66%, > 1 week. Center for Study of Population, 1998) Jan 1999: 48% adults aware of Truth campaign (Florida Dept Health, 1999)

Per capita consumption	Significant decline compared with baseline consumption and by comparison with rest of USA and greater than expected from price increase alone (Pierce et al., 1998c; Glantz 1993; Hu et al., 1995a; 1995b)	Significant decline during 1993-1996 compared with baseline period of 1990-1992 and for rest of USA, greater than expected for price increase alone (Harris et al., 1996; Biener et al., 2000)	Decline of 5.4% in 1995 after adjustment for stockpiling of lower-priced cigarettes - due to price increase only, since program did not start until 1996 (Hogan et al., 1996)	Significant decline compared with baseline consumption and by comparison with rest of USA (Pizicani et al., 1999)	Unknown
Adult prevalence	Rate of decline exceeded that of rest of USA from 1989 to 1993, but was less than for rest of USA in 1993-1996 (Pierce et al., 1998b)	Relative decline of 9% from three years before program to first three years of program, which was greater than 3% decline for rest of USA (Harris et al., 1996; Biener et al., 2000)	Change data not yet reported.	Relative decline of 6.4% to 21.9% in 1998, but no national comparison (Oregon Health Division, 1999)	Change data not yet reported.
Teen smoking	Within-state surveys show no change in 12-17 year old prevalence from 1990-93 and increase from 1993-96, and increase in nonsmoker susceptibility (Pierce et al., 1998b) Among 8^{th} and 10^{th} graders, relative increase in smoking prevalence from 1993 to 1996 was less than other US states (Unger et al., 1998)	Relative increase in 30-day prevalence < for rest of US for 8^{th} and 10^{th} graders from 1993 to 1996 (Briton et al., 1997); Relative increase for 9^{th} to 12^{th} graders < for rest of US from 1993-97 (Division of Adol School Health, 1999); Relative decline in lifetime use for 8^{th} graders compared to increase for rest of USA (Briton et al., 1997)	Change data not yet reported.	Among 8^{th} and 11^{th} graders, same as national trends for first two years of campaign (Oregon Health Division, 1999)	From February 1998 to 1999, relative declines in 30 day prevalence for middle and high school students (Bauer et al., 1999; 2000) were greater than national trends (University of Michigan News, 1999)