The Last Straw? Cigarette Advertising and Realized Market Shares among Youths and Adults, 1979-1993,

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The authors test the hypotheses that parameters of advertising sensitivity for adolescents are significant and perhaps larger than those for adults. Cigarette brand shares of advertising voice are found to be significantly related to realized market shares, with advertising sensitivity being about three times larger among teenagers than among adults. This result is robust to various analytic assumptions and converges with strategic analysis, consumer behavior theory and research, econometric metaanalyses, historical research, and corporate documents. The authors argue that cigarette competition between firms is predominated by the battle of brands for market share among the young, and assertions to the contrary, without supporting evidence, should be treated with scholarly skepticism.

Cigarette advertising has long been a subject of substantial academic, economic, and political interest. A fundamental concern has been the role of cigarette advertising in influencing cigarette primary demand (total consumption) and, particularly, the smoking behavior of children and adolescents. It is estimated that approximately one billion packs of cigarettes worth more than $1 billion are consumed annually in the United States by minors less than 18 years of age (DiFranza and Tye 1990). The younger the age of sampling and uptake (i.e., regular smoking onset), the greater the likelihood of chronic use as adults (Chassin et al. 1990). The World Health Organization now estimates that, of adolescents who continue smoking throughout their lives, “half will be killed by tobacco ... we can expect 200 million to 300 million children and adolescents under 20 (world-wide) currently alive to eventually be killed by tobacco” (Voelker 1995, p. 203). Thus, smoking uptake by minors has been the subject of two recent book-length literature reviews by the U.S. Surgeon General (U.S. Department of Health and Human Services [hereafter USDHHS] 1994b) and the Institute of Medicine (Lynch and Bonnie 1994) and has been the motivator for recent initiatives of the Food and Drug Administration describing nicotine addiction as a pediatric disease and nicotine as a design feature of cigarette products (Hwang, Freedman, and Frisby 1995; Kessler 1995a, b; Schwartz 1995).

Cigarette advertising attracts public and academic attention in part because there is so much of it. For 1993, total cigarette-industry advertising and promotional spending in the United States was over $6 billion, and it is still growing (Hwang 1995). Nonetheless, advertising is not the only contentious element of the industry’s marketing mix. Others have reported on product aspects, such as filter design and package labeling (Davis, Healy, and Hawk 1990; Gori 1990; Henningfield, Kozlowski, and Benowitz 1994); nicotine as a product design feature (Hilts and Collins 1995; Mahan 1994; Slade et al. 1995); product additives (Freedman 1995); and packaging graphics (Beed and Lawson 1992; Cunningham and Kyle 1995; Pollay 1994c). Other reports cover promotional aspects, such as advertising informativeness (Pollay 1991, 1993a), tar and nicotine data in advertising (Cohen 1995), targeting of minority groups (Blum 1989; Pollay, Lee, and Carter-Whitney 1992), sports sponsorship as access to television (Blum 1991; Ledwith 1984), and product placement in films (Bergman 1989; Hazan, Lipton, and Glantz 1994; Magnus 1985). Still others report on distributional aspects, such as sales of single cigarettes (Klonoff et al. 1994), unsupervised vending machines (Davis 1991), distribution near schools (Barovich et al. 1991), retail display advertising (Cummings, Scandria, and Lawrence 1991; Hilts 1995; Kennedy 1970), and free product sampling (Davis and Jason 1988).

Of all the recent advertising events, probably none have provoked more comment and controversy than the “Smooth Character (Joe Camel)” campaign for R. J. Reynolds’s
Camel brand, and there are several reports that this cartoon character was widely recognized by young children (DiFranza et al. 1991; Fischer et al. 1991; Konrad 1991). The use of trademarks for identification purposes only and does not imply endorsement by the Journal of Marketing, the authors, or their universities or employers, such as the USDHHS.

**Advertising Age** reported its own survey results, with Camel brand recall rates of 90% among children 8 to 13 years of age (Levin 1992). David Kessler (1995b, pp. 10–12), the Commissioner of the Food and Drug Administration, described the campaign as "irrelevant, humorous and sophomoric" and reported that even the researcher hired by R. J. Reynolds found children to be as familiar with Joe Camel as with Ronald McDonald. That effort modified Fischer and colleagues' (1991) procedures, yet it was still found that "Joe Camel had relatively high recognition compared to several trade characters," because more than 50% of children 3 to 6 years of age correctly matched the Joe Camel trade character with cigarettes (Mizerski 1995, p. 66). Other researchers have reported even higher recognition rates of 86% for 8-year-old children (Henke 1994).

This has led to health advocates and even marketing professionals expressing a great deal of concern about the potential consequences of the Camel campaign, because young children are "neither legally capable of using nor fully able to understand the potential risks associated with the product's use" (Mizerski 1995, p. 61). As one adman wrote: "Those of us in the marketing business know exactly what he's up to; we should be the first to denounce him" (DesRoches 1994, p. 23). The standard response of the cigarette industry to concerns about children and cigarette advertising has been to insist that "kids just don't pay attention to cigarette ads ... our advertising] purpose is to get smokers of competitive products to switch ... [which is] virtually the only way a cigarette brand can meaningfully increase its business" (R. J. Reynolds 1984, p. 89). This position is unconsciously echoed by others (e.g., Boddewyn 1986, 1989).

To explore the validity of this important assertion, our research focuses on interbrand competition, not starting behavior or aggregate smoking rates. We examine the market shares of various cigarette brands to discover the extent to which these are related to the relative intensities of previous and current advertising for these brands, "share of voice," reasoning that "even in mature markets, relative advertising is important for gaining sales" (D'Souza and Rao 1995, p. 39). As the president of the American Association of Advertising Agencies, John O'Toole stated, "Share of voice ... almost always corresponds to share-of-market" (Harris 1991, p. 24).

Recent surveys have found that the brand choices of adolescent smokers were heavily concentrated on those brands with the largest advertising budgets (Centers for Disease Control and Prevention [hereafter CDC] 1992, 1994). To study this phenomenon in greater detail, we determine the relationship between share of advertising voice and brand share of sales with standard market share econometric methods and assumptions, such as the distributed lagged effects of advertising on sales. We study the interbrand competitive effects of cigarette advertising for the market as an undifferentiated whole and with adolescents and adults as separated segments of the market.

Before presenting our research, we briefly review previous econometric studies while focusing on those reporting results from brand-level cigarette data. Next, we develop hypotheses and present both those inherent in industry assertions and alternative ones suggested by theoretical, strategic, and behavioral analyses, as well as by evidence from the tobacco trade itself. We then present our methods and results, which are followed by further discussion.

**Econometric Studies**

Previous efforts to study the role of cigarette advertising on sales have often been fraught with methodological difficulties that yield results that are sometimes inconclusive and/or contentious, particularly so for highly aggregated data. Many measurement and estimation problems in these econometric studies tend to produce ambiguous results with uncertain implications (Arbogast 1986; Chapman 1989; Franke 1994). Common obstacles include lack of both experimental control and systematic variation of the key variables; limited ranges for the key variables being observed; identification problems; treatment of lagged and durable effects of advertising; use of inappropriate criteria, such as total sales, rather than something more specific, such as brand shares, the number of starters, or quitting rates; the omission of key variables, such as antismoking public health programs; and the (mis)specification of key variables and their roles. At best, relating aggregate sales to aggregate advertising can only measure the marginal impact of the often small changes in actual aggregate advertising spending.

The most serious problem, however, is not methodological, but interpretive. At best, these types of studies estimate point elasticities of demand around current spending levels. If the elasticities were large, the firms would have a strong incentive to spend more. Therefore, we expect that discovered point elasticities around current spending levels should be low if spending is close to optimal. Too often, the equivocal results or small observed elasticities illogically are used politically to support the position that cigarette advertising bans would have no effect on consumption. Generalizing from studies of small variation to a total ban is clearly fallacious. As an analogy, consider an agronomist with meager results from a study of small variations of rainfall on plant growth concluding that these plants would be unaffected by a total drought. Analysts recognize that this is an inappropriate conclusion and generalization. "The non-significance and small magnitude of the estimated elasticities do not speak to the effects of a total ban on cigarette advertising" (Franke 1994, p. 39).

Despite the diversity of databases and time spans analyzed, the models employed, the covariates considered, and the methodological problems previously alluded to, Andrews and Franke's (1991) metanalysis of this large body of literature shows a significantly positive elasticity of demand with respect to advertising. Their review does not deal with the few cross-sectional studies or estimates based on survey results, but rather the many time-series analyses of industry
aggregate sales as a function of aggregate advertising and other variables, such as price. There were 48 such studies, which collectively covered the period from 1933 to 1990. Of these, 25 were based on U.S. data, another 13 were from the United Kingdom, with the remainder from other countries. The weighted mean advertising elasticity appeared to decline over time but was positive and significantly different from zero, as was the income elasticity. The calculated negative price elasticity meant that all three elasticities were in the directions that basic economic theory posits. Other meta-analyses and international literature reviews reach the same conclusion that advertising and its regulation has an influence on primary demand (Laugesen and Meads 1991; Smee et al. 1992; Toxic Substances Board 1989; USDHHS 1989a).

**Brand-Based Studies**

The majority of econometric studies of cigarette advertising and sales use aggregate data. “Only a few studies have examined the relationship between brand advertising expenditures and brand consumption, a vital component in the discussion of the effects of cigarette advertising” (Wilcox 1991, p. 63). Using data at the brand level can produce inferences and insights not obtainable from more aggregate data and this “improved understanding can lead to more effective regulations” (Wilcox and Richards 1990, p. 153).

In an early pioneering paper, Telser (1962) used brand-based data from 1912 to 1960 for various purposes, estimating (1) the returns to advertising brand by brand, (2) the dynamics of competitive rivalry using advertisement spending, (3) the depreciation of advertising capital (goodwill), and (4) repeat purchase parameters. The fourth is of strategic interest, because it measures “the fraction of sales they [the firms] retain from year to year” once a brand “obtains a cohort of customers by means of advertising” (Telser 1962, p. 483).

Peles (1971) discussed data for 22 brands representing all six U.S. firms for the period between 1953 and 1965. His models consider brand advertising expenditures for all other brands and show that advertising increases demand for cigarettes and that advertising’s effects carry over into future years with an advertising goodwill decay rate estimated at between 35% and 45%.

Schnabel (1972) studied cigarette-industry data for 18 brands from 1948 to 1963 by using Koyck’s (1959) depreciation of advertising goodwill and found a depreciation rate of 27 to 35%. Brands with large shares of advertising earned proportionately large market shares, which suggests no substantial economies of scale.

Another study of economies of scale for advertising examined 14 unnamed brands for the period between 1953 and 1970 with equations that included parameters for competitive advertising, as well as current and accumulated “advertising capital” (Brown 1978). This study concludes that advertising is a significant barrier to entry, which puts new brands at a disadvantage, including new brands introduced by the established firms. It also finds that the returns to advertising fell the longer a brand had been on the market, though this finding could be specific to the era studied—when the industry was dramatically transformed by new brands offering the technological innovation of filters.

Recently, Holak and Reddy (1986) examined ten brands over the period 1950–1979 to compare industry behaviors before and after the cessation of broadcast advertising. They conclude that the withdrawal of cigarette advertising from broadcast media changed the competitive dynamics of the industry. The broadcast ban appears to have had the effects of decreasing advertising elasticity, increasing price elasticity, increasing brand loyalties substantially, and in general acting as a barrier to competitive entry.

Holak and Tang (1990) studied 12 brands over the period 1952–1979 to explore the *product evolutionary cycle*, an alternative to the more familiar *product life cycle*. They found a causal relationship between advertising and sales for Marlboro, Viceroy, Winston, L&M, Kent, and Salem brands, with more ambiguous results for the older unfiltered Camels and Pall Malls.

Wilcox and Richards (1990) related separately the 1949–1985 sales for five brands (Kool, Salem, Winston, Benson & Hedges, and Marlboro) to brand advertising activity, price, and other variables. They found advertising expenditures to be significantly and positively associated with sales for four of the five brands—all save Winston. An expansion of this analysis to ten brands representing five of the six U.S. firms adds Newport to the list of brands for which advertising was significantly related to sales and concludes that “advertising is perhaps a fairly important marketing tool” (Wilcox 1991, p. 65).

**Hypotheses**

Industry Assertions and Null Hypotheses

Despite the metanalysis (Andrews and Franke 1991) indicating that elasticity of cigarette advertising is positive, some persist in believing that cigarette advertising is of little consequence, at least with respect to young children (e.g., Boddewyn 1989; Reid 1989; Ward 1959). Arguing that cigarettes are a so-called mature industry, it is claimed that cigarette advertising and promotional activity affects only brand-switching behavior among established adult smokers. These sort of testifiers would have us believe that by neither intent nor effect does cigarette advertising influence young people, reassure and retain existing smokers who might otherwise quit, or induce current smokers to smoke more—several of the ways that advertising might conceivably influence primary demand.

The assertion that cigarette advertising has little or no effect on the young is the basis for our null hypotheses. We postulate two such null hypotheses, one more stringent than the other. The more stringent H₁ asserts that there is no effect on teenagers whatsoever, whereas a less stringent formulation, H₂, posits that advertising effects on teenagers, if evident, are significantly smaller than those on adults. Expressed more formally,

\[ H₁: \text{Brand choices among teenagers are unrelated to cigarette advertising} \ (i.e., \beta_{\text{teens}} = 0, \text{where} \beta_{\text{teens}} \text{is a coefficient of advertising sensitivity for teenagers}). \]
Some reasons to doubt the mature market classification: 
(i.e., $\beta_{\text{mature}} = 0$). First, no industry evidence supports the classification of cigarettes as a mature market. This classification from the product-life-cycle typology is at the cornerstone of the contention that cigarette advertising in both intent and effect only influences brand loyalties and switching among existing smokers. To the best of our knowledge, no corporate documents have ever been produced in litigation or research that indicate that the mature market classification is an element in the industry’s own strategic analyses. There was no evidence to support the mature market opinions expressed by industry-nominated experts such as Ward (1989) or Reid (1989).

Second, the classification of cigarettes as a mature market is simplistic and fails to recognize the special nature of the industry. Many marketing and advertising textbooks do not even mention the product-life-cycle concept. When discussed, it is appropriately treated as a pedagogical generalization, not an axiomatic “fundamental law” with invariant implications, which tobacco industry spokespersons allege it to be (e.g., Reid 1989). Even as a generalization across other industries “the empirical evidence of the existence and pervasiveness of the product-life-cycle concept is quite uneven” (Lilien, Kotler, and Moorthy 1992, P. 513). The industry is unique in not only the addictive and deadly nature of its products (USDHHS 1988) and the associated publicity and marketing problems that these present, but also in its oligopolistic structure and legislative history and constraints.

Third, empirical evidence contradicts the classification. The cigarette industry fails the diagnostic tests indicative of mature markets, such as diminished profitability and advertisement spending. Furthermore, O’Toole, an advertising industry spokesman, states that advertising strategies for mature products “always specify the competitive brand from which the volume will be taken” (Colford 1986, p. 8, emphasis added). The industry fails this diagnostic test, too. J. Walter Thompson’s senior researchers who tried to apply this concept to the cigarette industry suggest that other researchers should “forget the product life cycle concept” (Dhalla and Yuseph 1976). They find that whether considering product class (e.g., cigarettes), product form (e.g., filter cigarettes), or brand (e.g., Winston), “it is not possible to validate the model at any of these levels of aggregation” (p. 103, examples in original).
tudes toward smoking held by their peers)” (Bonnie and Lynch 1994, p. 34).

Fourth, advertisements use appealing imagery. Depicting vigorous people in pristine outdoor environments or cigarette brand names in promotional association with sporting events, cigarette advertisements typically feature veritable pictures of health (Pollay 1991, 1993a; USDHHS 1994b, pp. 179–84). The imagined themes of cigarette advertisements (e.g., independence, adventure seeking, social approval, success and sophistication, healthfulness) are known to appeal to young people. The theme of independence, so captured by the Marlboro Man or Virginia Slims, is particularly resonant with the characteristic need of adolescents for autonomy and freedom from authority. Moreover, some of the models in cigarette advertisements appear particularly youthful (Mazis et al. 1992). The visual experience of this imagery, in contrast to verbal assertions, tends to “bypass logical analysis” (Cohen 1990; Puto and Wells 1984).

Fifth, the industry initiatives, past and present, must be considered. The tobacco industry has long displayed a strategic interest in the youth market (Pollay 1995; USDHHS 1994b, Chapter 5). Since the 1940s, the industry’s interest in the youth market has been manifest in the planning documents, market research activities, copy and creative preferences, and media plans for at least some brands. Marketing mixes have placed cigarette advertisements on billboards near schools and malls, and on after-school radio spots and television programs with effective reach into youth markets. The time preferences of the television advertising schedules of the 1960s correlated with the proportions of teenagers delivered in the audience, not that of adults (Pollay 1994a, b). R. J. Reynolds’s 1973 “Research Planning Document on Some Thoughts About New Brands for the Youth Market” describes programs for appealing to “learning smokers,” including adjusting the pH (acidity) to control the rate of nicotine absorption and appealing to anti-establishment sentiments (Schwartz 1995). Philip Morris considered targeting female teenage nonsmokers identified as “vulnerables,” because their friends and/or parents smoked and because they “shared many of the same values as the smokers” (Udow 1976, p. 7664).

Copy concepts for many brands have long focused on images of independence, with the industry knowing that autonomy and self-reliance is a dominant psychological need of adolescents (USDHHS 1994b). Trial evidence shows that the success of starter brands is the result of carefully planned and executed strategies, guided throughout by extensive research (Pollay and Lavack 1993). Many research documents, strategy statements, copy platforms, and media plans specify targets beginning at 15 years of age. R. J. Reynolds’s Canadian affiliate commissioned the customization of the “Youth Target Study ‘87” and obtained extensive data on subjects as young as 15 years of age. The popularity of their starter brand is attributed to their belief that “very young starter smokers choose Export A [cf. Camel] because it provides them with an instant badge of masculinity, appeals to their rebellious nature and establishes their position amongst their peers” (Pollay and Lavack 1993, p. 268–69). Its major competitor targeted 15-year old adolescents in its media plans and did not use smoking as a target audience criterion, thereby paying equally to reach both underage smokers and/or nonsmokers.

Some reasons to expect greater advertisement sensitivity among adolescents than among adults (i.e., $\beta_{\text{teen}} > \beta_{\text{adult}}$). Even if we conjecture that the U.S. firms base their strategies on a mature market concept, do not pursue the profit-maximizing strategies of attending to quitters and starters, no longer show the strategic interest in the young that is evidenced by their history, and behave differently from their Canadian subsidiaries, there are still several remaining reasons to believe that cigarette advertising and promotion has consequential effects among the young and that these effects might be more substantial than among adults. Both consumer behavior and psychology experts (e.g., Cohen 1990; Fishbein 1977) judge it highly implausible that cigarette advertising has no such effects. Their view is supported by the considerable evidence reviewed in two recent surveys of the research literature on cigarette advertising and the young by the U.S. Surgeon General (USDHHS 1994b, Chapter 5) and the Institute of Medicine of the National Academy of Sciences (Lynch and Bonnie 1994, Chapter 4).

First, identity formation and advertising attentiveness—adolescence is a time of identity formation, which makes teenagers especially attentive to both advertising and peer group influences for cues concerning symbols of adulthood and acceptance. Although adolescents pay only scant attention to warnings (Fletcher et al. 1995), they use advertising imagery as a window into the adult world. “Teens are also more susceptible to the images of romance, success, sophistication, popularity, and adventure which advertising suggests they could achieve through the consumption of cigarettes” (Nichter and Cartwright 1991, p. 242). Even brief cigarette advertisement exposures in laboratory settings can result in more favorable thoughts about smokers, enhance attitudes, increase awareness, and change brand preferences of the young (Hoek, Gendall, and Stockdale 1993; Pechmann and Ratneshwar 1994). “Cigarette advertising’s cultural function is much more than the selling of cigarettes. Its collective images represent a corpus of deeply rooted cultural mythologies that are not simply pieces of advertising creativity, but icons that pose solutions to real, experienced problems of identity” (Chapman and Fitzgerald 1982, p. 494). This was seen by the National Association of Broadcasters when it assessed an industry attempt at self-regulation. “The adult world depicted in cigarette advertising very often is a world to which the adolescent aspires.... To the young, smoking indeed may seem to be an important step towards, and a help in growth from adolescence to maturity” (Bell 1966, pp. 30–31).

This is consistent with consumer behavior knowledge reflected in textbooks and journals. “Teenagers have become increasingly aware of new products and brands. They are natural ‘triers’” (Loudon and Della Bitta 1993, p. 151). Because teenagers have a great deal of uncertainty about themselves and because they want to belong and find their own identity, they “actively search for cues from their peers and from advertising for the right way to look and behave”: they become “interested in many different products” that
can express their needs for "experimentation, belonging, independence, responsibility, and approval from others" (Solomon 1994, pp. 503–504). By high school, possessions and "badge products," such as cigarettes, are used as instruments for defining and controlling relations between people (Stacey 1982). In contrast, adults are not so caught up in processes of identity experimentation and discovery and the related searching of their environment for consumption items symbolic of aspirational identities. Their longer histories, particularly as smokers, likely gives them less interest in, and greater resistance to, the temptations of most new brands and/or advertising campaigns.

Second, adolescents are persuasion-coping novices. As consumers, the young tend to be more brand conscious, less price conscious, and less experienced in counterarguing against advertising and selling tactics (Brucks, Armstrong, and Goldberg 1988; McNeal 1992). Although there is only modest empirical evidence about the exact nature of persuasion knowledge at different ages, Friestad and Wright (1994, p. 7) note that teenagers, who are "novices in coping with advertising or selling encounters[,] may recognize only simple, superficial patterns in these events and have little proficiency with self-regulatory processes ... [and] coping strategies." It follows that "persuasion coping novices and people with considerable coping expertise may be influenced differently by the same persuasion attempt" (p. 13).

Third, previous research must be considered. "Young people know advertising better, appreciate brand-stretching advertising more," and possess an ideal self-image that is a better match to images created for cigarette brands than do adults (Rombouts and Fauconnier 1988, p. 317; see also Aitken et al. 1987). A recent study (Pierce and Gilpin 1995a; Pierce, Lee, and Gilpin 1994) reports data indicating that smoking rates among young women increased sharply in the late 1960s, coincident with the launch of Virginia Slims and other "female" brands. More recently, the three most commonly purchased brands among adolescent smokers in 1993 were the three most heavily advertised brands, and the changes in adolescents' brand preference for Marlboro and Camel between 1989 and 1993 did not appear to be explained by changes in overall market share for these brands so much as by changes in brand-specific advertising expenditures (CDC 1994).

Fourth, consider addiction and brand loyalty. Teens are a strategically important target audience, because brand loyalty is often developed during this time and this creates a "barrier-to-entry for other brands not chosen during these pivotal years" (Solomon 1994, p. 504). "This is a time when brand loyalties may be formed that could last well into adulthood"; The young are a "perpetually new market ... thus a marketer must not neglect young consumers who come 'on stream' if the company's brand is to have continued success in the older-age market" (Loudon and Della Bitta 1993, pp. 152–55, citing Moschis and Moore 1981). Previous econometric results have led to conjectures that "loyal and addicted buyers ... selectively screen out information about health hazards as well as competing advertising information" (Holak and Tang 1990, p. 25). In addition, we expect that the addictive nature of nicotine fosters high levels of brand loyalty and product dependence. The young have far less habituation to a specific brand because of their much shorter histories as smokers.

Fifth, segments have differential strategic attractiveness. Strategic analysis indicates that the cigarette firms should be far from indifferent to the dynamic phenomena of starting or quitting. The high rate of people quitting smoking and dying means that sales for this industry would drop precipitously were it not for a continuing influx of new starters. Concerned smokers who contemplate quitting are known in the trade as prequitters (Pollay and Lavack 1993). Profit-maximizing firms naturally want to reassure these customers to retain them. The cigarette industry is also well known for its phenomenally high brand loyalty, the highest of all consumer product categories (e.g., Alsop 1989). A relatively low rate of brand switching is evident, typically 10% or less (Cohen 1990, p. 239; Federal Trade Commission 1985; Gardner 1984; Siegel et al. 1996). There is nominal switching within brand families (e.g., from Brand X milds to Brand X lights), which is of little consequence to the firm's net profit. High brand loyalty resulting from the nicotine "satisfaction" of those addicted makes it difficult and expensive to convert competitors' customers. Most of the brand switching that does occur is by older, health-concerned, or symptomatic smokers trading down, typically within a brand family, to products with lower tar and nicotine labeling, in the misguided belief that those products are safer. As a result, the net present value of gaining the trade of these older customers is low compared with the value inherent in attracting young starters, the vast bulk of whom will be highly brand loyal for many years (Tye, Warner, and Glantz 1987).

This strategic situation has been evident to the industry for some time. In 1973, R. J. Reynolds' research and development officers wrote, "Realistically, if our Company is to survive and prosper, over the long term, we must get our share of the youth market" (Schwartz 1995). More contemporary corporate documents echo this idea in stating that "young smokers represent the major opportunity group for the cigarette industry," and "if the last ten years have taught us anything, it is that the industry is dominated by the companies who respond most effectively to the needs of younger smokers" (Pollay and Lavack 1993, p. 267).

Our alternative hypotheses, paralleling the industry's previous null hypotheses, are therefore:

\[ H_3: \text{Brand choices among teenagers are related to cigarette advertising (i.e., } \beta_{teen}) \]

\[ H_4: \text{Brand choices among teenagers are significantly more affected by cigarette advertising than are those among adults (i.e., } \beta_{teen} > \beta_{adult}) \]

The Data

Our data consist of market shares among adults and teenagers for five years between 1979 and 1993 (1979, 1986, 1989, 1992, 1993). Our analysis was based on information for nine brands, because some of the surveys measured only these brands specifically: Benson & Hedges, Camel, Kool, Marlboro, Merit, Newport, Salem, Virginia
Slims, and Winston. In addition, we have a time series of the advertising expenditures for each of the nine brands for each year in the period 1974–1993. The shares among teenagers are obtained from survey data, whereas those among adults are obtained from sales figures.2

Adolescent Brand Preference

The prevalence of smoking of each brand among adolescents was obtained from the following national surveys.

The National Health Interview Survey (NHIS), 1978–1980. The NHIS is a household survey of a nationally representative sample of the civilian, noninstitutionalized population of the United States and is administered by the National Center for Health Statistics and CDC. The 1978, 1979, and 1980 NHIS questionnaire asked current smokers to name the brand they smoked most often. Although the NHIS is usually administered only to persons 18 years of age and older, the 1978–1980 surveys included 17-year-old respondents, which provides an opportunity to estimate brand preference among adolescents. To increase the sample size, we used the combined data for the years 1978–1980. The total sample size for 17-year-old smokers was 243.

The 1986 Adult Use of Tobacco Survey (AUTS). The AUTS is a telephone survey of a nationally representative sample of the civilian, noninstitutionalized population of the United States; the respondents were 17 years of age and older; and the survey was administered by CDC’s National Center for Chronic Disease Prevention and Health Promotion (USDHHS 1989b). To estimate adolescent brand preference for 1986, we used data for current smokers 17 to 18 years of age, because the sample size for 17-year-olds alone was too small to provide stable estimates. The total sample size for smokers 17 to 18 years of age was 100.

The 1989 Teenage Attitude and Practices Survey (TAPS). Data on knowledge, attitudes, and practices regarding tobacco use were collected from a national household sample of adolescents 12 to 18 years of age through a computer-assisted telephone interviewing system, administered by CDC and the National Cancer Institute (Allen et al. 1993). The 865 respondents who reported that they usually bought cigarettes themselves were asked the brand they usually smoked. We used data from the 554 respondents 12 to 17 years of age to determine brand preferences among adolescents.

The 1992 Gallup Poll. This was a national telephone survey of adolescents 12 to 17 years of age and included a question on current brand preference (Gallup 1992). The sample size of current smokers who provided brand preference information was 165.

The 1993 Teenage Attitudes and Practices Survey-Il. This survey, jointly administered by CDC, National Center for Health Statistics, and the Robert Wood Johnson Foundation, used a methodology similar to the 1989 Teenage Attitude and Practice Survey, and involved both a follow-up of the 1989 respondents and a cross-sectional survey of approximately 5000 new respondents 10 to 15 years of age (USDHHS 1994a). We obtained estimates of adolescent brand preference from the sample of respondents 12 to 17 years of age. The sample size of current smokers who provided brand preference information was 438.

Adult Market Share

The adult market share for individual brands was obtained from Maxwell’s consumer reports for each year (Maxwell 1980, 1989, 1994). Although sales to children are included in the aggregate data, this inclusion is unlikely to substantially affect the estimates of market share among adults. Nevertheless, we adjusted the estimates of adult market share for each year and brand by using adolescent brand preference data to subtract the estimated proportion of cigarettes smoked by adolescents. We used national data to estimate the average amount smoked by adults and adolescents and subtracted adolescent consumption volume to adjust the adult market share data.3 To estimate the average amount smoked by adults and adolescents, we used data from the National Household Survey on Drug Abuse for the years 1979, 1985, 1988, 1990, 1991, and 1992.4

Brand-Specific Advertising

We obtained brand-specific advertising expenditures for the years 1974–1993 from Competitive Media Reporting (1993, 1994). This group reported annual expenditures by brand in each of the following medias: magazine, newspaper, Sunday supplement, and outdoor. We used total expenditures over all four medias. Data collected before 1988 do not include newspaper advertising expenditures, but this change in the reporting system affects all brands measured. The data do not, however, include costs of sponsorships, sampling, or other promotional activities, nor the costs of advertising de-

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2To check the validity of using prevalence-based survey data to estimate market shares, we compared the overall market shares predicted from the prevalence of self-reported brand use in the 1986 Adult Use of Tobacco Survey (AUTS) to the sales-based market shares reported by Maxwell (1989) for 1986 for the 28 brands examined in the AUTS. These two measures were highly correlated (r = .99). For the nine brands examined in our study, we compared survey-based data for adults with sales data for the years 1979, 1986, and 1987. The difference between survey and sales estimates seemed to be random, with no correlation to advertising level (r = .03). Regressing these survey data against sales shows a strong correlation (r = .98), with only two outlying data points, both for Marlboro, which tip the regression slope to the perfect diagonal to a value of 1.1. These analyses reassure us that survey data on the prevalence of brand use is a reasonable proxy for sales-based market share data. Nonetheless, we subsequently examine the robustness of our findings by an analytical replication that omits the Marlboro data.

3For each brand, total cigarette sales were reduced to adult shares by subtracting the estimated teenage cigarette sales volume, calculated as the product of teenage market share, the number of teenage smokers, and the average amount smoked by teenagers. The adult market share in any year is each brand’s sales in proportion to the total for all brands.

4This survey, which was administered by the National Institute on Drug Abuse until 1992, is now administered by the Substance Abuse and Mental Health Services Administration (USDHHS 1993).
sign and production. Expenditures were adjusted to 1992 dollars using the Consumer Price Index (IMF 1994).

The data for the nine brands show a substantial range of values for advertising share of voice and realized market shares among adolescents and adults (see Table 1).

Methodology

Most previous modeling of advertising effects have used sales as a dependent variable. Because the dependent variable of interest here is market share, we employ an attraction model wherein a brand’s market share is equal to its attraction relative to all others. More formally, the market share $\text{MS}_i^t$ for brand i ($i = 1, 2, ..., m$) in the period t and segment s is given by

$$\text{MS}_i^t = \frac{A_{i}^{s}}{\sum_{j=1}^{m} A_{j}^{s}}$$

where $A_{i}$ is the attraction of brand i in period t and segment s. Such a formulation satisfies the logical-consistency requirements of market share models (Naert and Bultez 1973); that is, predicted market shares are nonnegative, and the sum of estimated market shares is bounded by zero and one. A general specification for the attraction function is

$$A_{i}^{s} = \prod_{k=1}^{K} f_k(X_{ik}^{s})^{\beta_k},$$

where

- $X_{ik}^{s}$ is the value of the kth explanatory variable, $X_k$, for brand i (e.g., brand advertising) in period t,
- $f_k$ is a monotone transformation on $X_k$ and
- $\beta_k$ is a parameter to be estimated.

Two possible specifications for the attraction function are the multiplicative competition interaction (MCI) model and the multinomial logit (MNL) model. Cooper and Nakaniishi (1988, pp. 35–36) recommend using the latter specification to model advertising’s impact on market share, because the predicted elasticity can capture threshold effects. We follow this advice and specify the attraction function as follows:

$$A_{i}^{s} = \exp (\alpha_i + \beta \text{Adstock}_i + \epsilon_{it}),$$

where

- $\alpha_i$ is a parameter for the constant influence of brand i,
- Adstock$_i$ = advertising goodwill of brand i in period t,
- $\epsilon_{it}$ = an error term, and
- $\beta$ = an advertising-sensitivity parameter.

Two nested models are estimated. In the first, M1, a single $\beta$ parameter is used in the attraction function to model the impact of advertising on brand share. The second model, M2, captures the differential impact of advertising on adolescents and adults with the following attraction function:

$$A_{i}^{s} = \exp (\alpha_i + \beta_s \text{Adstock}_i + \epsilon_{it}),$$

where $\beta_s$ equals the segment-specific, advertising-sensitivity parameter. Thus, two different advertising coefficients are estimated in M2 as opposed to a single coefficient in M1. If our hypotheses are supported, we expect M2 to fit the data better than M1 and $\beta_{teen}$ to be greater than zero and, perhaps, greater than $\beta_{adult}$ in model M2.

Advertising Measures

A simple method of measuring the impact of advertising on sales is with a current effects model, in which current market shares are presumed to depend solely on current advertising expenditures. However, because several arguments can be made for why advertising’s effect on sales may be distributed over time (Hannsens, Parsons, and Schultz 1990, p. 214), we employ a parsimonious method to capture the impact of the advertising expenditures of the previous period. Suppose that advertising for brand i in period $t$, Ad$_{it}$, affects its market share for subsequent periods and, in turn, that market shares in a given period are affected by previous, as well as present, advertising. In the spirit of the Koyck-type models used to study the advertising-sales relationship (Koyck 1959), the effective advertising, or Adstock at time $t$, where the brand subscript i has been dropped for convenience, can be written as

$$\text{Adstock}_t = b_0 \text{Ad}_{t-1} + b_1 \text{Ad}_{t-2} + \ldots$$

Although estimating separate coefficients for each period is not possible without a large number of data points, we can make the simplifying assumption that the coefficients
show an exponentially decaying pattern over time (Clarke 1976). Equation 4 can then be written as

\[ \text{Adstock}_i = b_0 \lambda \text{Adstock}_{i-1} + b_0 \lambda^2 \text{Adstock}_{i-2} + \ldots , \]

where \( 0 < \lambda < 1 \). Writing out the expression for \( \text{Adstock}_{i-1} \) and subtracting it from Equation 5 yields

\[ \text{Adstock}_i = (\text{Adstock}_{i-1}) \lambda + b_0 \text{Ad}_{i-1} . \]

Equation 6 can be further simplified by assuming \( b_0 = 1 - \lambda \), thereby yielding

\[ \text{Adstock}_i = \lambda \text{Adstock}_{i-1} + (1 - \lambda) \text{Ad}_{i-1} . \]

When defined in this manner, the \( \text{Adstock} \) measure parsimoniously captures the advertising history and is analogous to the brand-loyalty measure used in brand choice models estimated on scanner data (e.g., Guadagni and Little 1983). Adstock is initialized equal to the brand’s share of advertising expenditure in the first period for which advertising data is available (i.e., 1974). For any value of \( \lambda \) the Adstock measure for every other period is calculated by using Equation 6 successively on each brand’s advertising share.

**Model Calibration**

The models are estimated by ordinary least squares regression after applying the log-centering transformation to the data (Cooper and Nakashima 1988) for each period \( t \). The regression equation used to estimate the parameters of M1 is specified as follows:

\[ \text{MS}_i^* = \alpha_i + \sum_{j=1}^{m} \alpha_j d_j + \beta (\text{Adstock}_i - \text{Adstock}_{i-1}) + \epsilon_i^* , \]

where

- \( \text{MS}_i^* = \log (\text{MS}_i^* | \text{MS}_i^*) \), \( i = 1, 2, \ldots, m \);
- \( \text{MS}_i^* \) is the geometric mean of \( \text{MS}_i^* \);
- \( d_j = 1 \) for brand \( j \) and 0 otherwise;
- \( \epsilon_i^* = \epsilon_i - \bar{\epsilon}_i \); \( \bar{\epsilon}_i \) is the arithmetic mean of \( \epsilon_i \) over \( i \) in period \( t \); and
- \( \text{Adstock}_i \) is the arithmetic mean over \( i \) of Adstock in time period \( t \).

Model estimation is carried out in two steps. In the first, we pick a value for smoothing constants \( \lambda \) and calculate Adstock for all periods. These advertising measures are then used in estimating M1 and M2 with the procedure previously described.\(^5\) Repeating the process with different \( \lambda \) values enables us to select the best-fitting model on the basis of the adjusted R\(^2\) criteria.

**Results**

We used \( \lambda \) values ranging from 0.0 (the current effects model) to 0.9 in increments of 0.1 and found that a smoothing constant of .8 or .7 provided the best fit for M1, whereas \( \lambda = .3 \) provides the best fit for M2.\(^6\) Because our main focus is not the magnitude of the advertising carryover coefficient, we examined the differences between M1 and M2 for both \( \lambda = .7 \) and \( \lambda = .3 \). In Table 2, we report the parameters obtained in estimating the two models.

A comparison of columns A and B represents a conservative test of the null hypothesis, because \( \lambda \) has been chosen to maximize the fit of M1. A more appropriate comparison, perhaps, is of columns A and D. Finally, as a test of the null hypothesis, we can also compare columns C and D. All three comparisons show that M2 fits better than M1 (incremental F-ratios significant at the .01 level), which supports the hypothesis that \( \beta_{teen} (12.51/10.48) > \beta_{adult} (5.33/3.06) \). A t-test of the difference between \( \beta_{teen} \) and \( \beta_{adult} \) yields a t-statistic of 2.62 \( (p < .01) \) for \( \lambda = .7 \) and 3.36 \( (p < .01) \) for \( \lambda = .3 \). Advertising sensitivity among adolescents is not only substantial, but is also significantly larger than that among adults. In our best fitting model, M2 for \( \lambda = .3 \), \( \beta_{teen} \) is 3.42 times larger than \( \beta_{adult} \). Even if our estimate of \( \beta_{teen} \) is 10% higher because of our use of survey rather than sales data, \( \beta_{teen} \) is still significantly larger than zero and \( \beta_{adult} \). Under this conservative assumption, \( \beta_{teen} \) is still two to three times larger than \( \beta_{adult} \).\(^7\)

**Modeling the Imitation Effect**

A plausible supplemental hypothesis is that advertising may have an indirect effect on the young by directly effecting adult smoking behavior, which adolescents imitate. According to this view, therefore, brand market shares among teenagers might be explained substantially by incorporating an imitation effect into the model. To do this we rewrite Equation 3 as

\[ \lambda_i^* = \exp (\alpha_i + \beta_i \text{Adstock}_i + \beta_{teen}^T \text{Imit}_i + \epsilon_i) , \]

where

- \( \text{Imit}_i \) = market share of brand \( i \) among adults in period \( t \),
- \( \beta_{imit} \) is imitation response parameter, and
- \( \delta^T = 1 \) if \( s = \text{teenager} \) and 0 if \( s = \text{adult} \).

Other terms and parameters are as defined in Equation 3. To the extent that teenagers imitate adults, we expect that brand market shares among adults are a good predictor of the corresponding market share among teenagers (i.e., \( \beta_{teen} > 0 \)). In addition, if the impact of advertising on teenagers occurs\(^6\) The results indicate that the best-fitting value actually lies in the range from \( .7 < \lambda^* < .8 \). A finer grid-search may be used to locate this value were this the focus of our research. On the basis of a reviewer comment, we fixed the decay parameters for the adult group at .7 and .3, respectively, and varied the parameter for the teenage group (\( \lambda \)) from .1 to .9 in increments of .1. The results supported our main hypothesis (i.e., the relationship \( \beta_{teen} > \beta_{adult} \)).

\(^7\) Because our formulation does not account for the possibility that both advertising and sales are jointly affected by other factors, a reviewer suggested we test whether advertising is exogenous to market share using lagged values of advertising as an instrumental variable (IV) for Adstock. We operationalized the instrumental variable as Adstock\(_{i-1}\) and used Hausman’s (1978) specification test for the difference between \( \beta \) and \( \beta_{IV} \). The results did not reject the null hypothesis of advertising exogeneity.
only through an imitation effect, we expect the advertising coefficient to be nonsignificant in this formulation. We reestimated M2 with the enhanced specification of Equation 9. The advertising carryover parameter \( \lambda \) was fixed at .7. \( \beta_1 \) was estimated as -.027 and was statistically nonsignificant (\( t = -.51; p < .62 \)). Similar results were obtained with the carryover coefficient fixed at \( \lambda = .3 \). Taken together, these results reject the notion that the advertising impact on adolescents we observe is indirect and due to imitation behavior.

**Elasticity Analysis**

A clearer picture of differences in advertising response across segments is obtained by calculating segment-specific advertising elasticities, which are the ratios of the relative change in market share corresponding to a relative change in advertising. For the MNL formulation used in this study, the expressions for elasticity are given by

\[
\varepsilon_{\text{teen}} = \beta_{\text{teen}} (1 - MS_{\text{R}}) \text{Adstock}_{\text{R}} \\
\varepsilon_{\text{adult}} = \beta_{\text{adult}} (1 - MS_{\text{R}}) \text{Adstock}_{\text{R}}
\]

An average brand, with a 10% market share and an Adstock level of 10%, has elasticities \( \varepsilon_{\text{adult}} = .28 \) and \( \varepsilon_{\text{teen}} = .94 \), where \( \lambda = .3 \). In other words, a 10% increase in the Adstock variable results in approximately a 3% increase in market share among adults and approximately a 9.5% share increase among teenagers. As before, when compared to adults, adolescent are estimated to show a threefold sensitivity to advertising.

**Robustness of Results**

The main focus of this work, the relationship \( \beta_{\text{teen}} > \beta_{\text{adult}} \), seems robust. It is supported by alternative formulations of the model, wherein each segment is allowed to display different decay parameters (see footnote 5). Using the Multiplicative Competitive Interaction model specification, we also reestimated the models reported in Table 2 and found nearly identical results to those based on the preferred MNL specification. Finally, to explore the effect of using survey data for brand shares for adolescents, we reran our analysis for \( \lambda = .3 \), without Marlboro data. Despite the loss of degrees of freedom and the omission of the single most popular brand among teenagers, our results still indicate that \( \beta_{\text{teen}} > \beta_{\text{adult}} \). For this case, both \( \beta_{\text{teen}} \) and \( \beta_{\text{adult}} \) are significant, with \( \beta_{\text{teen}} \) 2.77 times larger than \( \beta_{\text{adult}} \)—a close approximation to the findings we report in Table 2. Under many varied analytic conditions this data rejects the industry's null hypotheses of little or no effect among the young (H1 and H2) and supports H3 and H4, the alternative hypotheses, which anticipate a substantial relationship between brand market shares among adolescents and brand advertising during the past and present.

**Discussion**

To our knowledge, this is the first study to examine the relationship between the intensity of brand-level cigarette advertising and the separate effects on brand market shares realized among adults and adolescents. Using standard techniques to analyze market share, we modeled the impact of cigarette brand advertising on realized market shares to allow for current and historical effects of advertising and for effects of brand advertising relative to total advertising in the competitive set. The results, which are robust under many assumptions, support our hypotheses that (1) brand choices among teenagers are significantly related to cigarette advertising and (2) the relationship between brand choices and brand advertising is significantly stronger among teenagers than among adults. The greater advertising sensitivity among teenagers is in part due to scale (i.e., high fractions of teenagers concentrated on highly advertised brands), and in part due to dynamics (i.e., teenagers' brand choice patterns responding to changes in advertising intensity). Furthermore, the impact of advertising on brand choices among the young apparently cannot be dismissed as teenagers imitating adult brand choices. These results reject the null hypotheses of little or no relationship between advertising and cigarette sales among the young.

**Limitations**

Further research could seek to validate our results with new data without the less-than-ideal aspects of our data set. Three such aspects are subsequently discussed, with comments as to how these aspects might have affected our ability to discover results.
Survey data. Information on adolescent brand preferences was obtained from survey data, whereas information on adult brand preferences was based on sales data. The primary difference between the two is that survey-based data can measure share as a proportion of all people, which may not be exactly the same as the proportion of total consumption if different brands are smoked at substantially different rates. However, we found an extremely high correlation between prevalence-based market share estimates and sales-based market shares, which suggests that using survey data to estimate market shares is reasonable and unlikely to have seriously influenced the results of our model. Even if deflated to account for any possible bias in using survey data, our results remain substantial and statistically significant.

Unequal age distributions. The age distribution of respondents in the five surveys used to obtain adolescent market share data was not identical in all the years studied, and brand preferences might vary by age, even within the relatively narrow range of teenage years. If so and if the older teenagers providing our data for some years behave more like adults than the younger ones, this would have the effect of biasing results toward adolescents who seem less distinct from adults. If so, this limitation works against our finding that \( \beta_{\text{teen}} > \beta_{\text{adult}} \), and the potential bias suggests that the true advertising sensitivity among teenagers would be even greater than that observed here, particularly for the younger ones.

Advertising only. Our data set included only advertising expenditures. Brand-level cigarette promotion and merchandising expenditure data were not available. Thus, we are unable to comment directly on the differential effects of brand-level sponsorships, contests, catalogues, and in-store merchandising expenditures on realized market shares among adults and adolescents.

Consistency With Previous Research

Our finding of a small effect of advertising intensity on market share among adults from 1979 to 1993 is consistent with some previous research. Holak and Reddy (1986) evaluate the effect of brand-specific advertising on brand sales before and after the 1970 advertisement ban. Their study reveals that advertising elasticity for eight of ten brands decreased in the postban period and that there was no significant effect of advertising for any of the brands after the ban. The finding of an adult advertising elasticity of .28 is consistent with the mean advertising elasticity of .22 found in a metaanalysis of many studies in many industries (Assmus, Farley, and Lehmann 1984). Finding a teenager advertising elasticity that is about three times larger than the adult’s is consistent with the idea that new users of any product are less fixed in their ways than older habitual users. Our findings about greater advertising sensitivity among the young are consistent with the basic observations that their brand choices are highly concentrated on the brands most heavily advertised (CDC 1992, 1994). Our results display a similar pattern to those found by California’s Operation Storefront. “Heavy advertising in stores exactly matches the brand preferences of children who smoke ... but the ad prevalence does not match adult smoker preferences” (Hilts 1995, B10). Our results are also consistent with European research “suggesting that adolescents are more susceptible to tobacco advertising than are adults” (Rombouts and Fauconnier 1988, p. 308). They are consistent, too, with a review of the effectiveness of antismoking advertising on underage smoking (Pechmann, forthcoming) and the historical coincidence of the timing of youth initiation rates with major campaigns (Pierce and Gilpin 1995b). They are also consistent with the conclusions of the Surgeon General’s Report (USDHHS 1994b) that cigarette advertising puts children at greater risk by influencing young people’s perceptions of the pervasiveness, image, and function of smoking—all of which are psychosocial risk factors.

On Attracting Young Consumers

We examine brand-level cigarette advertising and its relation to brand choices among adolescents and adults, but do not directly examine the impact of advertising on smoking initiation among the young. Further research might expand on the approach presented here to model specifically the relationship between brand-based cigarette advertising and the young’s initiation to smoking various brands. Although our study does not deal with data on product adoption or starting behaviors, our results nonetheless provide evidence that smoking behaviors of adolescents are demonstrably related to previous and current cigarette advertising. With the recent literature reviews, this suggests that marketing, particularly in its promotional aspects, plays a role in the epidemiology of pediatric nicotine consumption and the subsequent diseases (see Table 3). If the perceptions, attitudes, and beliefs governing brand choice are influenced by cigarette advertising, it seems implausible that those same brand perceptions, attitudes, and beliefs have no influence whatsoever on consumption in general. It is impossible to advertise a specific brand without also simultaneously advertising cigarettes as a product class. As the Philip Morris Marketing Vice President famous for managing Marlboro’s success states, “A cigarette company’s ads are not just competing with ads for other brands. You are competing with every other advertiser in America for a share of the consumer’s mind” (Watside 1974, p. 133). Advertising that makes a cigarette brand attractive inevitably also makes cigarette smoking attractive, at least the smoking of that brand.

Public Policy Implications

Our study has some important public policy implications. The most important stems from our finding that, whether or not intended, cigarette advertising is significantly related to adolescents’ smoking behavior. Because advertising influences the use of cigarettes among a consumer group to whom selling cigarettes is illegal, the government has a legitimate interest in regulating cigarette advertising. Our results also suggest that regulating cigarette advertising may be an effective policy intervention for influencing smoking behavior among adolescents. The authors of the Institute of Medicine’s literature review recommend that this be done at federal, state, and local levels, though it would require repealing current preemptive federal legislation (Bonnie and
Lynch 1994). (For more on legislative options with respect to tobacco advertising, see Blum and Myers 1993; Burns 1994; Pytte 1990.)

The Last Straw?—An Implication for Marketing Scholars

Metanalysis has shown cigarette advertising elasticity to be positive. Strategic analysis indicates that new users who subsequently become addicted and loyal clientele offer greater expected net present value than do brand switchers. Historical analysis shows the industry’s strategic interest in adolescents to be long-standing. Analysis of contemporary corporate documents shows a continuing interest in capturing the young, among whom virtually all starting occurs. Content analysis of advertising shows that cigarette advertising imagery largely consists of pictures of health and images of independence, which are known by the industry to resonate with adolescent needs for autonomy and freedom from authority. Behavioral analyses show that cigarette advertising constitutes a psychosocial risk factor. Our market share analysis adds to the existing literature by showing that teenage smoking behavior is not only related to previous and present advertising, but also that this relationship is about three times stronger among teenagers than among adults.

Given the preponderance of evidence that cigarette advertising plays a meaningful role in influencing the perceptions, attitudes, and smoking behavior of the young, it is appropriate for scholars to treat the hypotheses of no effects on youth with substantial skepticism. The disciplines of academic research and scientific inquiry require that we reject hypotheses that lack evidence to support them, especially when multiple lines of evidence support alternative hypotheses (Pollay 1993b). The present research and the mass of related work already in hand in no way obviates the need and desirability of additional studies, but the mass and direction of evidence indicates that balanced scholars should doubt industry assertions of there being no effects on the young until they are supported with evidence and analysis comparable to what supports the alternative hypotheses. Although objective scholars may reasonably presume there to be some impact of cigarette advertising on adolescents, further research can contribute to improving our understanding of the processes by which this impact in realized—the when, where, why, how, and to whom types of questions (for a well-articulated research agenda, see Warner et al. 1992).

| TABLE 3 |
| An Outline of Marketing’s Role in the Epidemiology of Pediatric Nicotine Addiction¹ |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| **Corporate**                   | **Transmissions**              | **Contagions**                  | **Infections**                  |
| (Strategic Goals)              | (Tactics and Tools)            | (Perceptions and Predispositions) | (Adoptions)                     |
| Need New Users                 | Target New Users               | Judgments of Prestarters        | Get New Users                   |
| Strategic Analysis             | Promotional Budgets $16,000,000/day | More Brand/Product Awareness    | Number of Starters $3,000/day   |
| Replace the dying              | $6,000,000,000/year            | More Brand/Product Attractiveness | $1,000,000/year                |
| Replace quitters               | Imagery Employed               | Brand and Product Badge        | Ages                           |
| Switchers fickle and frail     | Pictures of health             | Effects                        | Most when 12–15 years of age   |
| High share of youth ⇒         | Slim fashionability            | Peer and social approval        | Getting younger                 |
| High share overall             | Cartoon dudes                  | Independence                    |                               |
| Seek Friendly Familiarity      | Some youthful models           | Sexiness                       | Vulnerable Segments             |
| Normalize Smoking              | Media Plans                    | Maturity                       | Low self-esteem                 |
| for more social acceptance    | 15-year-olds and up            | Judgmental Bias: Incidence     | White > Black                   |
| among targets                  | Nonsmokers included            | % of adults who smoke           | Poor > Affluent                 |
| among peers                    | Street Saturation              | % of peers who smoke           | TGIF > Leaders                  |
| among parents, etc.            | Outdoor, transit,              |                                 | Skids > Wimps                   |
| Corporate Documents,           | shelters, taxi tops, store     |                                 | Total Sales to Minors           |
| Plans and Actions              | windows, etc.                  |                                 | $1,000,000,000,000 packs        |
| Canada                         | Intensive Distribution         |                                 | > $1,000,000,000/year           |
| Strategy                       | Signage and displays           |                                 |                               |
| Research                       | Point-of-sale merchandising    |                                 |                               |
| Creative Media                 | miscellaneous: push plates,    |                                 |                               |
|                                | baskets, clocks, change        |                                 |                               |
|                                | trays, ash trays, etc.         |                                 |                               |
|                                | Vending machines               |                                 |                               |
|                                | Product Sampling               |                                 |                               |

Conclusions

Because brand shares of advertising voice are significantly related to subsequently realized market shares, cigarette advertising appears to influence the smoking behavior of adolescents. This finding is robust to various assumptions regarding the carryover of advertising effects from period to period and accounting for the possibility that the behavior of adolescents is an imitation of adults who have been influenced by advertising. Notably, the effect is substantially larger among adolescents than among adults by a factor of about three. The battle of the brands for market share is waged largely among the young, for it is a brand's success among the young that leads to greater brand sales and profit in the long term.

Because of the many behavioral, strategic, historical, theoretical, and empirical lines of argument and research to which our results add, the preponderance of logic and evidence indicates that cigarette advertising is an important influence on the smoking behavior of the young. Scholars should treat the assertion that cigarette advertising has little or no effect on adolescents as naive or disingenuous.

REFERENCES


