

# **Advertising and tobacco consumption**

**Analysis of the effects, with particular  
reference to children and adolescents**

Report for the  
Federal Ministry of Health

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# Table of contents

## Summary

- 1. Introduction**
- 2. Questions considered**
- 3. Epidemiology of tobacco consumption in Germany**
- 4. Risk factors associated with tobacco consumption**
  - 4.1 Contextual factors
  - 4.2 Personal factors
- 5. Advertising strategies**
  - 5.1 Advertising goals
  - 5.2 Advertising methods
  - 5.3 Advertising strategies
  - 5.4 Advertising messages
- 6. Models for measuring the effects of advertising on smoking commencement**
  - 6.1 Cognitive-affective models
  - 6.2 Learning theory models
  - 6.3 Shaping of self-image
- 7. Influence of advertising**
  - 7.1 Perception and recall
  - 7.2 Cognitions and attitudes
  - 7.3 Needs and motivations
  - 7.4 Self image
  - 7.5 Social interaction within the peer group
  - 7.6 Receptivity to tobacco advertising and the experimentation phase
  - 7.7 Smoking initiation
  - 7.8 Econometric studies of the connection between advertising expenditure and tobacco consumption
- 8. Effects of advertising bans**
  - 8.1 Norway
  - 8.2 Finland
  - 8.3 New Zealand
  - 8.4 France
  - 8.5 Germany in comparison with Norway, Finland, New Zealand and France
  - 8.6 Possible effects of an advertising ban in Germany –  
Effects on the advertising industry and acceptance of the ban by the public
- 9. Brief comments on the questions considered in this report**

## Bibliography

## Summary

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This report, commissioned by the Federal Health Ministry, investigates the effects of advertising on the consumption of tobacco products, with particular reference to children and adolescents. The analysis of the complex effect mechanisms is based on an examination of the empirical data available, together with psychological theories and models which can explain the connections between advertising and tobacco consumption.

The available epidemiological data show that per capita consumption of tobacco for the total population of Germany in 1996 was 1 862 g. The prevalence of regular smoking among over-15s in 1995 was 28.3%. The prevalence of occasional and regular smoking among 14-25 year-olds in 1993 was 44%. Overall, more men smoke than women, but in adolescence the figures are evenly balanced. Most young people who have smoked were under 14 years of age when they first tried. These figures demonstrate that smoking in Germany continues to be widespread and that, in view of the associated health risks, something needs to be done about it. This applies in particular to children and adolescents, since many studies have shown a strong positive correlation between experimentation with tobacco in adolescence and regular smoking as an adult.

Scientific research has identified a whole series of risk factors for regular smoking in adolescence. Easy availability of cigarettes, e.g. from vending machines, and relatively low prices compared with available income, encourage smoking. Smoking is more prevalent among the lower social classes. The strongest smoking predictor is the presence of same-age smokers in the peer group. A stormy parent-child relationship and a bad climate at school are also risk factors. Personal factors, apart from the critical age of adolescence and early experimentation, are positive attitudes to smoking, positive intentions to smoke and poor performance at school. Smoking also correlates positively with consumption of alcohol and illegal drugs.

Advertising can be considered to be a further risk factor. Close analysis of advertising goals, methods, strategies and messages gives the lie to the tobacco industry's argument that advertising is aimed solely at adults and with the sole purpose of persuading them to change brands. In particular, Richard Pollay, a Canadian Professor of Marketing, has shown that the tobacco market is not a saturated market nor a stable one, since smokers are constantly quitting smoking or dying of diseases caused by smoking. Out of all consumer goods, brand loyalty is highest for cigarettes. Minors form the easiest target group from which to attract new smokers. The tobacco industry has been targeting young people for decades, as evidenced by various internal documents (such as those that have come to light in connection with court cases) and by scientific analyses of particular advertising campaigns and their effects. Adverts often invoke themes to which young people are particularly susceptible, such as the craving for independence. The imagery portrays smoking as an expression of independence, a rite of passage towards adulthood, a social facilitator, a positive social norm and non-dangerous to health. Marketing-mix strategies combine indirect advertising (e.g. brand transfer and sponsorship) with direct advertising (e.g. sales promotion measures and commercials) in order to achieve a synergistic effect.

Theoretical models from the fields of communication science and psychology can be used to provide a better understanding of how advertising affects experience and behaviour. Communication theory views advertising as information that is broadcast, that is absorbed and processed by the recipient, and that leads to observable behaviour, in this case tobacco consumption. Psychological models are concerned with how cognitive-affective processes

and learning processes, in particular model-based learning, influence young people's smoking behaviour. The "planned behaviour" theory explains the intention to act as the result of attitudes towards the action in question and of subjective norms. It can be shown that advertising influences social norms, in contributing towards a situation where smoking is regarded as desirable in society and in the peer group. Social-cognitive learning theory claims that the behaviour of models is closely imitated when such behaviour visibly produces a desired benefit. Advertising messages, such as the image of autonomy, suggest to the consumer that he can gain independence through smoking and not solely through his own endeavours. This has the result of weakening the consumer's own self-effectiveness and strengthening a desired self-image. It has been shown time and again that the probability of smoking commencement increases whenever there is a discrepancy between the current and the ideal self-image.

The effects of advertising on experience and behaviour are extremely complex. It has been well demonstrated empirically that even young children are aware of cigarette advertising and have a good recall of adverts. They are more familiar with certain characters in advertisements than adults. The images used in advertising exert a much stronger effect on adolescents than on adults, since adolescents, who are still in the identity-formation phase, react very sensitively to symbols of adulthood. Several studies demonstrate a positive correlation between the ability of adolescents to recall a particular advert or trademark and intention to smoke, commencement of smoking or extent of smoking. Adolescents who are predisposed to smoking tend to overestimate the proportion of smokers in their own age-group and the social benefits of smoking, and to underestimate the risks. Compared with adults, adolescents generally have less well developed cognitive capabilities and coping strategies for resisting the advertisers' ploys.

Empirical studies indicate not only that advertising reaches young people but also that the more that young people actively participate in advertising campaigns, the much more likely they are to experiment with smoking. The American researcher John P. Pierce has shown, using historical analyses, that after major advertising campaigns there is an increase in the proportion of young people taking up smoking, i.e. becoming regular smokers. The effects were sex-specific when campaigns were aimed at particular target groups: if the campaign's advertising messages were aimed at women, the smoking initiation rate among women rose.

Econometric studies provide further evidence of the link between advertising and tobacco consumption. It has been shown that an increase in the advertising budget for individual brands led to increased consumption of these brands by both adolescents and adults, albeit to different degrees: adolescents responded three times more strongly than adults to changes in advertising expenditure.

As part of a package of health policy measures to reduce the number of smokers and the amounts of tobacco smoked, some countries have introduced bans on the advertising of tobacco products. In some cases these have been in force for more than 20 years. Epidemiological data demonstrate that the introduction of an advertising ban leads to a reduction in tobacco consumption and prevalence rates. A longitudinal comparison of average per capita tobacco consumption in Norway, Finland, New Zealand and France from the introduction of these countries' advertising bans until 1996, with the figures for Germany over the same period, shows a substantially greater reduction of consumption in all these countries compared with Germany. Norway's reduction in per capita consumption is twice as great as Germany's, Finland's and France's reductions are more than three times as great, while New Zealand's reduction is 50% greater.

However, isolating and measuring the influence of the ban on advertising within the overall package of anti-smoking measures is fraught with methodological difficulties. Nevertheless, a whole series of respected medical societies, as well as the scientific journal "Science", assume that the data are so conclusive as to justify a package of health policy measures that includes bans on advertising.

# 1. Introduction

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At the European level, a number of proposals have been submitted in recent years for the adoption of a directive imposing a total ban on tobacco advertising in the Member States of the European Union. These proposals have opened up an intensive health policy debate on the effects of such a measure.

Against the background of the latest proposal for such a directive at the end of 1997, the Federal Health Ministry commissioned this report on the state of knowledge regarding the effects of tobacco advertising on the consumption of tobacco products, with special reference to young persons.

The most recent relevant studies on this theme were to be examined and evaluated within a space of a mere two months. We would not have been able to do this without the help of various colleagues, to whom we offer our thanks:

- Meri Paavola and Silvianna Ratte, as well as Dr Erkki Vartiainen from the European Network on Young People and Tobacco (Helsinki, Finland), helped in the literature search and made relevant studies available to us.
- Dr Martina Pötschke-Langer from the Deutsche Krebsforschungszentrum Heidelberg provided us with the results of her own literature search.
- Peter Lang from the Bremer Institut für Präventionsforschung and Sozialmedizin also made literature available to us.
- Dr Ulrich Eicke, Lübeck, provided us with his own studies on this theme.
- Gerhard Christiansen from the Bundeszentrale für gesundheitliche Aufklärung Köln made a special analysis of the "Drug affinity study".
- Burckhard Junge from the Robert-Koch-Institut Berlin provided us with the latest epidemiological data on smoking behaviour by Germans and was always available to help us with any special epidemiological questions.

Finally, our thanks go to Silja Knolle (final year psychology student) for her enormous contribution in researching the literature.

Kiel, March 1998

Reiner Hanewinkel, Johannes Pohl

## 2. Questions considered

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The report examines the effects of tobacco advertising on the consumption of tobacco products. It is based on the 1993 report of the "Gesellschaft für sozialwissenschaftliche Forschung in der Medizin"/"Bremer Institut für Präventionsforschung und Sozialmedizin" (GESOMED/BIPS). In this context, our analysis focuses especially on the more recent literature.

The report was constructed in October/November 1997. The questions considered were the following:

1. Can it be demonstrated that tobacco advertising influences children and adolescents in their attitudes towards smoking and their smoking behaviour?
2. Does tobacco advertising have an influence on total tobacco consumption and on smoker rates (prevalence, or smoking commencement), or only on the establishment of brand preferences? Does advertising help to increase/maintain total consumption levels, and do bans or restrictions on advertising help to reduce total consumption?
3. Can national and international studies demonstrate a link between advertising bans/restrictions and smoking prevalence, and on what additional factors do the trends depend? Or do they demonstrate that there is no such influence?
4. Compared with other factors (parents, peer group, etc.), how important, qualitatively and quantitatively, is the (socio-)psychological influence of advertising in motivating children and adolescents to start smoking and become regular smokers?

The more recent literature is presented, based on the GESOMED/BIPS (1993) report. The analysis and overall evaluation is based on the empirical data, viewed against the background of psychological theories and models which can help to explain the links between advertising and tobacco consumption.

Relevant publications were sought in the scientific data banks PsychLit, Psyndex, Medline, SOMED, ECONIS, SOLIS and FORIS, using the keywords "Rauchverhalten Jugendlicher" (Smoking behaviour by adolescents), "Zigarettenwerbung" (Cigarette advertising) and "Verbot von Tabakwerbung" (Banning of tobacco advertising). The search was confined to studies published between 1993 and 1997, since older studies have already been presented in the GESOMED/BIPS (1993) report. Of course, important older studies are also considered in the report. We were also able to make use of other people's searches conducted in the context of their own research projects into the smoking behaviour of adolescents.

The report is structured as follows:

Chapter 3 presents recent epidemiological data on tobacco consumption in Germany. Chapter 4 describes risk factors for tobacco consumption. Chapter 5 deals with the methods, strategies and messages of tobacco advertising. Chapter 6 deals with communication theory models and psychological models for assessing the effects of advertising. Chapter 7 begins by presenting empirical findings on the effects of advertising on various areas of experience and behaviour, then goes on to present important results of recent research into the influence of advertising on the susceptibility of adolescents to experiment with smoking or take up smoking, and closes with a description of the only econometric meta-analysis conducted to date on the correlation between advertising expenditure and tobacco consumption by adolescents, compared with adults. Chapter 8 presents longitudinal data

from four countries which have introduced strict bans on tobacco advertising, and compares smoking prevalence and average annual per capita tobacco consumption in these countries with the corresponding data for Germany over the same period of time. The report concludes with a brief summary of the findings.

### 3. Epidemiology of tobacco consumption in Germany

Tobacco was already being consumed by Indian tribes in America at least 2 500 years ago. It was introduced to Europe after Christopher Columbus discovered the New World in 1492, after which it spread rapidly to the rest of the world during the sixteenth and seventeenth centuries. Nothing could stop it – not even the introduction of the death penalty for tobacco consumption in countries such as Turkey in 1605 or Japan in 1638, where smoking was punishable by beheading, hanging or quartering (Hess, 1989).

Despite the health damage that both active and passive smoking can cause, epidemiological studies show that smoking remains widespread in Europe and in Germany (Glantz & Parmley, 1995; Leuenberger, Schwartz, Ackermann-Liebrich, Blaser, Bolognini, Bongard et al., 1994; Peto, Lopez, Boreham, Thun & Heath, 1994; Peto, Lopez, Boreham, Thun & Heath, 1996). Junge (1997) lists the epidemiological studies of smoking behaviour in Germany conducted in the 1990s (see Table 1). Some of the studies differ substantially from others in terms of structure, questions asked and sample size. The smoking prevalence rates varied, depending on age sample and sex, between 19% and 44%, but were nevertheless relatively stable within these groups in the period between 1990 and 1995.

The percentage of smokers normally relates not to the entire population irrespective of age, but only to that part of the population aged 15 and above. According to the 1995 microcensus (Federal Statistical Office, 1996), which is by far the largest epidemiological survey in Germany, 28.3% of this age cohort are smokers, namely 35.6% of the males and 21.4% of the females.

**Table 1.** Percentage of smokers in the old (West) and new (East) Federal Länder in the 1990s (Junge, 1997).

Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Year	1990	1990	1990	1991	1991	1991	1992	1992	1992	1993	1994	1995	1995	1995
No.	21.600	2.200	2.000	2.000	2.000	5.600	2.800	337.000	4.500	3.000	2.500	7.800	3.300	342.000
Age (Years)	12-39	14+	16+	16+	16+	25-69	25-69	15+	12-39	12-25	18-59	18-59	15+	15+
Smokers (%)														
males West	39	36	38	-	-	39	-	36	-	41	40	42	37	35
males East	44	-	-	38	43	-	40	39	44	38	38	45	42	37
females West	37	21	22	-	-	28	-	22	-	35	35	30	22	22
females East	34	-	-	25	26	-	21	20	34	27	25	29	23	19

**Note:**

Study 1: Herbst, K., Schumann, J. & Wiblishauser, P.M. (1993). Repräsentativerhebung zum Konsum and Mißbrauch von illegalen Drogen, alkoholischen Getränken, Medikamenten und Tabakwaren – Untersuchungen in den neuen Bundesländern 1992. Bonn: Bundesministerium für Gesundheit.

Study 2: Bundeszentrale für gesundheitliche Aufklärung (Publisher) (1992). Aktionsgrundlagen 1990. Teilband Rauchen. Köln.

Study 3: Bundeszentrale für gesundheitliche Aufklärung (Publisher) (1992). Rauchen, Alkoholkonsum und Medikamentenmißbrauch in den neuen Bundesländern. Köln. Telephone survey.

Study 4: Bundeszentrale für gesundheitliche Aufklärung (Publisher) (1992). Rauchen, Alkoholkonsum und Medikamentenmißbrauch in den neuen Bundesländern. Köln. Telephone survey.

Study 5: Bundeszentrale für gesundheitliche Aufklärung (Publisher) (1992). Rauchen, Alkoholkonsum und Medikamentenmißbrauch in den neuen Bundesländern. Köln.

Study 6: Die Gesundheit der Deutschen – ein Ost-West-Vergleich von Gesundheitsdaten (1995). Berlin: Robert-Koch-Institut.

Study 7: Die Gesundheit der Deutschen – ein Ost-West-Vergleich von Gesundheitsdaten (1995). Berlin: Robert-Koch-Institut.

Study 8: Statistisches Bundesamt (Publisher) (1994). Fachserie 12: Gesundheitswesen, Reihe S. 3: Fragen zur Gesundheit 1992. Stuttgart: Metzler-Poeschel.

Study 9: Herbst, K., Schumann, J. & Wiblishauser, P.M. (1993). Repräsentativerhebung zum Konsum und Mißbrauch von illegalen Drogen, alkoholischen Getränken, Medikamenten und Tabakwaren – Untersuchungen in den neuen Bundesländern 1992. Bonn: Bundesministerium für Gesundheit.

Study 10: Bundeszentrale für gesundheitliche Aufklärung (Publisher) (1994). Die Drogenaffinität Jugendlicher in der Bundesrepublik Germany – Repeat survey 1993/1994. Köln.

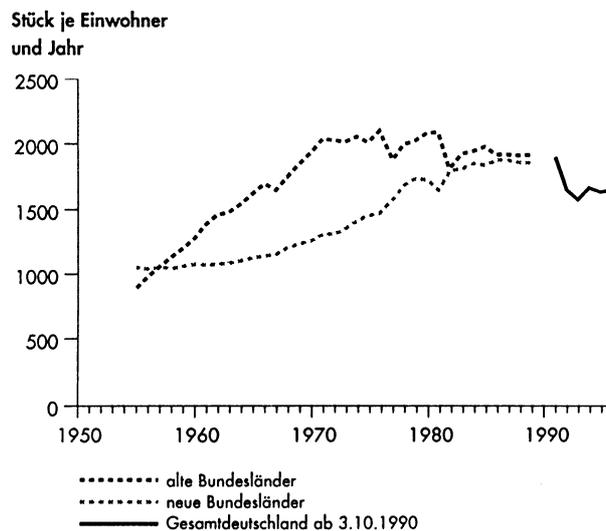
Study 11: Herbst, K., Kraus, L., Scherer, K. & Schumann, J. (1995). Repräsentativerhebung zum Gebrauch psychoaktiver Substanzen bei Erwachsenen in Germany – Telephone survey 1994. Bonn: Bundesministerium für Gesundheit.

Study 12: Herbst, K., Kraus, L. & Scherer, K. (1996). Repräsentativerhebung zum Gebrauch psychoaktiver Substanzen bei Erwachsenen in Germany – Written survey 1995. Bonn: Bundesministerium für Gesundheit.

Study 13: Bundeszentrale für gesundheitliche Aufklärung (Publisher) (in process of being printed). Aktionsgrundlagen 1995. Köln.

Study 14: Statistisches Bundesamt (Publisher) (1996). Fachserie 12: Gesundheitswesen, Reihe S. 3: Fragen zur Gesundheit 1995. Stuttgart: Metzler-Poeschel.

Information on the smoking behaviour of the population can also be deduced from the tobacco products statistics. Cigarette consumption in Germany in 1996 rose by just under 1% compared with 1995 – equivalent to approximately 1.2 billion extra cigarettes (Junge, 1997). Figure 1 shows per capita consumption of cigarettes in Germany over a period of 40 years.



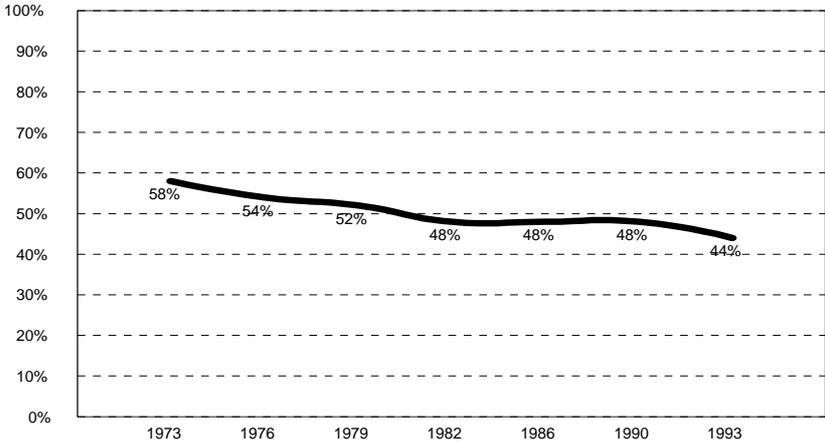
Key to graphic	
Stück je Einwohner und Jahr	Cigarettes per inhabitant per year
alte Bundesländer	Old Länder
neue Bundesländer	New Länder
Gesamtdeutschland ab 3.10.1990	All Germany from 3.10.1990

**Figure 1.** Per capita cigarette consumption in Germany (Junge, 1997).

Every three years since 1973 epidemiological surveys regarding the “drug affinity” of adolescents and young adults have been conducted for the Bundeszentrale für gesundheitliche Aufklärung (Federal Centre for Health Education) (BZgA). The last such survey was published in 1994 (BZgA, 1994). It is a representative survey, the last one of which comprised 2 000 respondents from the old Länder and 1 000 respondents from the new Länder. Figure 2 shows the trend of the percentage of (occasional and regular) smokers among 14-25 year-old adolescents and young adults over a 20-year period.

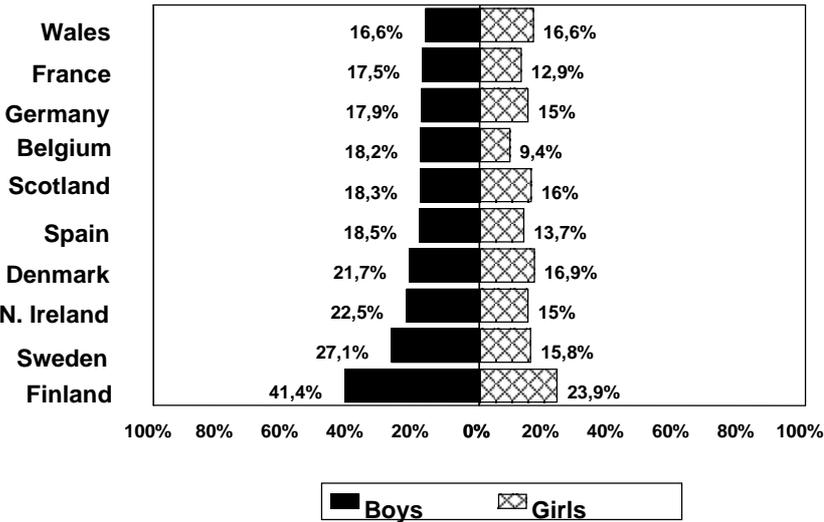
There has been a clearly observable change in the number of young smokers. While 58% of 14-25 year-olds were smokers in 1973, this figure had fallen to 44% by 1993. The

percentage of never-smokers rose from 14% to 32% over the same period. This reduction in the percentage of smokers has, however, not been constant. After a clear reduction in the number of young smokers between 1973 and 1982, the figures remained stable at a high level in the 1980s. Even in 1993, almost one in two 14-25 year-olds smoked. According to this survey, 62% of 12-25 year-olds and 68% of 14-25 year-olds have smoked at some time, whether this was something they did regularly in the past or whether it is something that they still do occasionally or regularly.



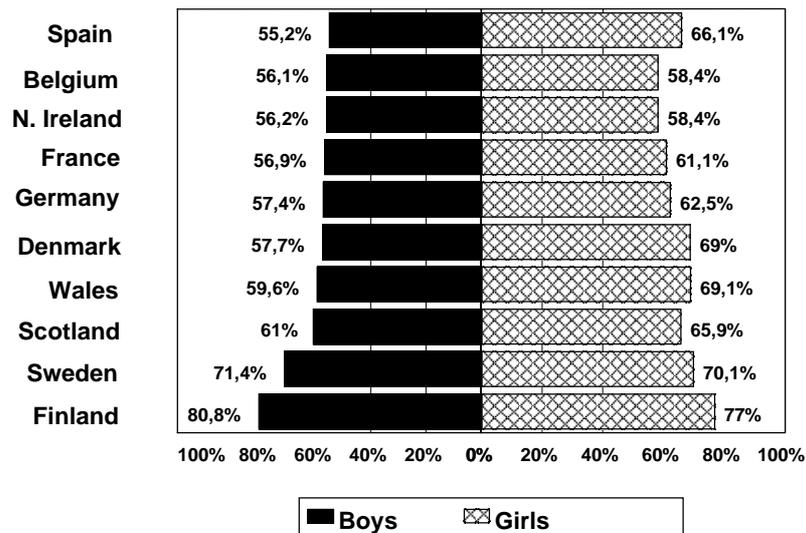
**Figure 2.** Changes in smoking behaviour. Percentage of smokers among 14-25 year-olds in Germany (BZgA, 1994).

A study submitted by the World Health Organisation (King, Wold, Tudor-Smith & Harel, 1996) is presented in Figures 3 and 4. It provides information about the ages at which smoking initiation normally begins. In most countries of Europe, round about 20% of young males have had their first experience of cigarette smoking by the age of 11. The percentage of young females who have tried smoking by the age of 11 is much lower.



**Figure 3.** Percentages of 11-year-olds in Europe who have already smoked (Age-related prevalence according to King et al., 1996).

It is noticeable that the figures gradually even out. By the age of 15, at least as many girls, percentage-wise, as boys have tried smoking. In eight of the ten countries surveyed, the percentage of girls who have tried smoking by that age is higher than the percentage of boys. By then, the majority of adolescents apparently have experience of smoking.



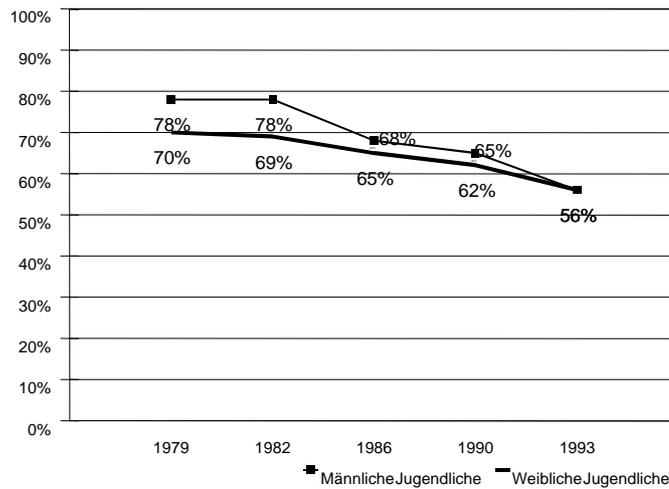
**Figure 4.** Percentages of 15-year-olds in Europe who have already smoked (Age-related prevalence according to King et al., 1996).

Those who registered a positive smoking balance tended to have lifestyles characterised by particular values, interests and attitudes (rejection of traditional values such as success, good health, satisfaction, thrift; a positive attitude towards certain adult behaviours such as smoking and drinking, not showing weakness, looking like an adult, seeking fun, adventure, independence; leisure-time activities involving bars and discos and watching action films and sex films; greater dissatisfaction with present living conditions).

Conforming with these figures, a survey by Simon, Bühringer and Wiblishauser (1992) of more than 10 000 representatively selected persons showed that 37% had had their first cigarette between the ages of 10 and 15. Similarly, Ashton and Stepney (1982) indicate an average age of 12 for smoking commencement.

The BZgA "Drug affinity study" (1994) also reports on the age of smoking commencement. A large proportion of the young people with experience of smoking had begun before the age of 14. Among the 12-25 year-olds, the average age at which the first cigarette was tried was 13.8 years. Longitudinal analysis reveals a positive trend in the 14-25 age-group, whereby the percentage with first experience of smoking below age 14 was lower in 1993 than in 1979 (see Figure 5).

The lower the age of smoking commencement, the higher the probability that the subject will go on to become a regular smoker (Meier, 1991). Meier assumes that 60% of the regular smokers had already begun smoking by the age of 13. 90% of those who commenced later had their first cigarette before age 20. The probability of becoming a smoker once the age of adolescence has passed, for example after the age of 20, is therefore relatively low (Kandel & Logan, 1984). At the same time, early initiation into smoking is the strongest single predictor for continued regular smoking (Chassin, Presson, Rose & Sherman, 1996; Dryfoos, 1990; Stanton, McClelland, Elwood, Ferry & Silva, 1996). On the basis of all these findings it is clear that, in order to prevent smoking, an important objective must be to prevent early initiation into smoking, so that smoking does not turn into a regular habit at a young age.



**Figure 5.** Adolescents who were younger than 14 when they tried their first cigarette, as a proportion of all adolescents who have smoked at some time (BZgA, 1994).

Key to Figure 5	
Original text	Translation
Männliche Jugendliche	Male adolescents
Weibliche Jugendliche	Female adolescents

Charting the exact course of smoking over the longer-term is difficult, since extensive longitudinal studies would be needed. Purely cross-sectional studies cannot provide the answers, since psycho-social factors in the different age cohorts could have influenced the basic probability of smoking (v. Stünzner, 1994). Tölle and Buchkremer (1989) indicate that smoking increases in the years of adolescence and young adulthood, levels out between ages 20 and 50, and thereafter declines. Many smokers quit smoking in middle age. According to a study by Mittag and Onnen (1991), the percentage of ex-smokers rises as follows: 7% among under-20s, 9% among 20-29s, 13% among 30-39s, and 17% among 40-49 year-olds.

Smoking is more widespread among the lower than the higher social classes (Flint & Novotny, 1997). The data from the German cardio-circulatory prevention study (Schwarzer, 1996; Fuchs & Schwarzer, 1997) show that males who gained their "Abitur" (roughly: A-levels) smoke only half as frequently as males with only basic secondary education. This correlation was also noted by Borgers (1988), who studied 125 different occupational groups. Even in adolescents, the difference is already apparent. Semmer, Cleary, Dwyer, Fuchs and Lippert (1987), for example, in the Berlin-Bremen study, showed that the prevalence of regular smoking among seventh and eighth grade students (i.e. age roughly 13 and 14) in the *Gymnasium* (roughly: grammar school) was 7%, compared with 35% in the *Hauptschule* (roughly: secondary modern school). The same findings were replicated in our own study of 1 637 students in Schleswig-Holstein (Hanewinkel, 1997).

The results of the epidemiological studies can be summarised as follows:

1. Approximately 28.3% of over-15s smoke.
2. There is a gender difference: overall, more men smoke than women.
3. The majority of young persons who have experience of smoking were under 14 years of age when they first tried it.
4. In middle adolescence, the percentages of girls and boys who have smoked at some time are approximately equal.
5. The earlier that experimentation with smoking begins, the greater the probability of the habit stabilising and of the subject becoming a regular smoker in adulthood.
6. Smoking is more widespread in the lower than in the higher social classes.

## **4. Risk factors associated with tobacco consumption**

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Various processes help to dictate whether a person smokes, does not smoke or no longer smokes. Obviously, the motives that come into play will be different for an adolescent smoking his first cigarette than for an adult who has already been smoking for decades (Schwarzer, 1996). According to Flay (1993), the smoking career can be divided into five separate phases:

1. First comes the preparation phase, when knowledge, convictions and expectations are formed regarding cigarette consumption and the related functions (image of self as a glamorous, independent, mature person; improved concentration, less stress, improved social relationships).
2. Next comes the entry phase, in which the opportunity to smoke arrives and the first experiments with smoking are made (one to three occasions).
3. Depending on experiences in the entry phase (taste, dizziness, nausea, boosting of social status, etc.), the subject may move on to the experimental phase, during which he/she smokes repeatedly, but not regularly, over an extended period. Smoking during this phase is typically situation-specific, for example it might occur only at parties.
4. In many cases there then follows the regular consumption phase, during which the subject smokes regularly, for example every weekend, or every day on the way to school.
5. In the final phase, nicotine addiction can result.

Intensive investigations have been conducted into the risk factors that may predict whether a person will go through the various phases of the smoker's career. In this connection, risk factors are those variables associated with increased probability of regular smoking in later life. In contrast, protective factors are those variables which increase the probability of not experimenting with smoking. Discussion of the relative significance of risk factors and protective factors in connection with the development of substance consumption habits and various other forms of dysfunctional behaviour occupies an important place in the more recent literature (Coie, Watt, West, Hawkins, Asarnow, Markman et al., 1993; Dryfoos, 1990, 1991; Florsheim, Tolan & Gorman-Smith, 1996; Institute of Medicine, 1994; Rutter, 1994; Yoshikawa, 1994).

The subsequent sections of this chapter outline the current state of knowledge regarding risk factors specifically relating to tobacco consumption. Protective mechanisms are not discussed, since these are not the subject of this report and much less is known about the protective factors than about the risk factors for tobacco consumption (Durlak, 1995). Included in this overview are the results of various research groups who have investigated in depth the risk factors for the consumption of psychotropic substances (Bry, McKeon & Pandina, 1982; Clayton, 1992; Hawkins, Catalano & Miller, 1992; Newcomb, Maddahian & Bentler, 1986). Apart from indicating specific factors which explain at least part of the variance of subsequent tobacco consumption, we also show results of intervention studies geared towards preventing tobacco consumption. If the risk factors for tobacco consumption can successfully be prevented and no consumption occurs in the long term, this constitutes further sound evidence of the validity of the risk factor.

Risk factors can be divided into those that are primarily context-related and those that are primarily person-related.

The contextual factors include:

- economic circumstances, such as availability, price, the individual's economic and social situation,
- cultural norms regarding the use of tobacco products,
- the social environment, such as peers (same age-group), siblings, parents, quality of social relationships within the family and school.

Tobacco advertising as a contextual factor is discussed in detail from Chapter 5 onwards.

The personal factors include:

- age,
- genetic influences and personality traits,
- knowledge, attitudes and behaviour intentions,
- school performance,
- sense of personal worth,
- previous experimentation and early commencement of consumption.

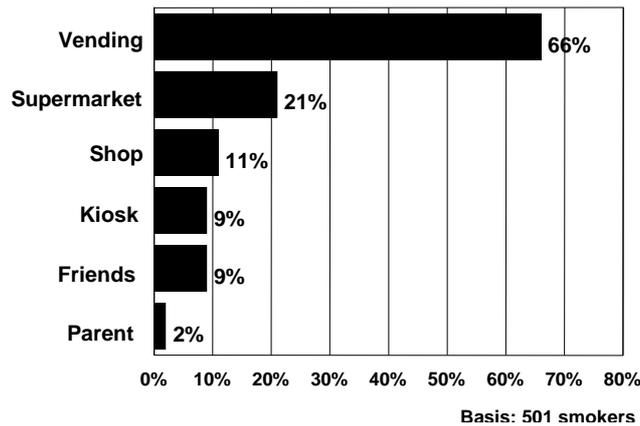
## **4.1 Contextual factors**

### **Availability**

The availability of tobacco obviously depends on the laws and regulations and on the cultural norms relating to the use of tobacco in a society. The effect of varying availability is difficult to measure empirically. In a correlative study, however, Maddahian, Newcomb and Bentler (1988) demonstrated, for a cohort of adolescents, that consumption of cigarettes, alcohol, marijuana and other drugs was significantly positively linked to the availability of these substances, even when the amount of money available to them was taken into account as a control variable. Various more recent studies confirm the positive correlation between tobacco availability and consumption (Biglan, Henderson, Humphrey, Yasui, Whisman, Black & James, 1995; Carruthers & McDonald, 1995).

Indirect evidence of the effect of tobacco availability on consumption is provided by a Bavarian survey of the health behaviour of adolescents, in which around 2 000 persons have been questioned since 1973 (Bayerisches Staatsministerium für Arbeit, Sozialordnung, Familie, Frauen und Gesundheit, 1997).

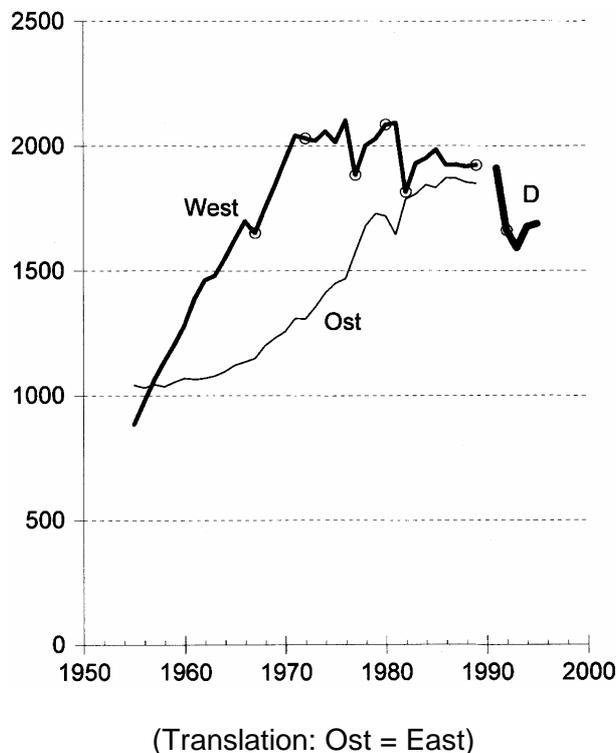
Figure 6 shows the results of the latest survey (1995). According to these figures, two-thirds of young smokers get their cigarettes from vending machines and one-fifth buy them in the supermarket. Compared with these two sources, the other sources (each accounting for about 10%) are relatively insignificant. If we add together the numbers who get their cigarettes from vending machines (66%) and those who get them from friends, we see that adolescents get most of their cigarettes from sources beyond the social control of adults. On this basis it can be concluded, at least as a hypothesis, that restricting the availability of cigarettes by abolishing vending machines would reduce consumption among adolescents (Gambescia, 1995).



**Figure 6.** Sources of tobacco products for 12-24 year-olds in Bavaria (Bayerisches Staatsministerium für Arbeit, Sozialordnung, Familie, Frauen and Gesundheit, 1997) (Respondents may cite more than one source).

### Price

The effect of duty increases on the prevalence of tobacco consumption was analysed in 17 American studies (Zimring & Nelson, 1995). It was shown that a 10% increase in price led to a 4,5% decline in consumption. Eleven studies from European countries, Australia and Canada and a further, more recent Californian study (Hu, Keeler, Sung & Barnett, 1995; Hu, Sung & Keeler, 1995) confirm this finding. The effects observed for Germany are shown in graph form in Figure 7.



**Figure 7.** Per capita cigarette consumption in Germany. The circles indicate years in which the tobacco duty on cigarettes was increased. (Junge, 1996).

It can be observed that per capita consumption of cigarettes in the year concerned either fell below the previous year's level (1977, 1982, 1992) or that the continuing upward trend was interrupted (1967, 1972, 1980). Tobacco consumption did not decline completely. To some extent, people started using cheaper alternatives. In both 1977 and 1982, two-thirds of the decline was made up for by increased consumption of rolling tobacco. When, in 1992, duty was increased both on cigarettes and rolling tobacco, only one-fifth of the decline in cigarette consumption was made up for by increased rolling tobacco consumption (Junge, 1996).

The effect of duty increases must be viewed against the background of available income. It is only when the percentage rate of the duty increase exceeds the percentage rate of the increase in available income that it can be assumed that the duty increase has actually caused the real price of tobacco products to rise.

### **The individual's economic and social situation**

In the preceding chapter on the epidemiology of tobacco consumption we showed that smoking correlates with socio-economic status (Nutbeam, 1997; US Department of Health and Human Services, 1994): tobacco consumption is more widespread in the lower than in the higher social classes. Tallying with this, Flint and Novotny (1997) found in a survey of 250 000 persons that poverty is a risk factor for tobacco consumption. It appears justified, therefore, to include the individual's material situation and social position as a risk factor for tobacco consumption.

### **Cultural norms relating to the use of tobacco products**

Traditional social norms influence the onset of smoking and the process of continuing to smoke (Pierce & Gilpin, 1995). Social attitudes towards smoking have changed significantly a number of times in Germany during this century. At the beginning of the century, for example, very many more men than women smoked. Up until the Second World War, smoking was a privilege of the male population. For example, analysis of the data for the oldest years of birth (1916 to 1930) in the German cardio-circulatory prevention study (v. Stützner, 1994) shows the age-related prevalence of smoking to be over 80% for men and only 27% for women.

Wetterer and v. Troschke (1986) find, in an overview of the literature, that tobacco consumption is associated with socio-demographic variables and ethnic and other group norms.

Cultural norms are also picked out as a central theme in school smoking prevention programmes, with cigarette consumption being portrayed as undesirable. These normative elements boost the effectiveness of the programmes, as evidenced by lower rates of smoking take-up among participants when compared with control groups (Botvin, Baker, Dusenbury, Botvin & Diaz, 1995, Ellickson & Bell, 1990; Dielman, 1994; Hanewinkel, Burow & Ferstl, 1996; Hanewinkel, Ferstl & Burow, 1994; Kröger & Hanewinkel, 1996; Vartiainen, 1997; Vartiainen, Paavola, McAlister & Puska, 1998).

### **Social environment**

Families influence their children's tobacco consumption in various ways. Apart from genetic transmission (see 4.2), the influence of learning from models in the initiation phase of tobacco consumption is very important. This process is very well documented in the literature. It has been shown that children are more likely to smoke if both their parents or other family members such as siblings smoke (Biener & Vogt, 1977; Brauner, 1980; Brook, Whiteman, Gordon & Brook, 1988; Hansen, Graham, Sobel, Shelton, Flay & Johnson, 1987). The smoking behaviour of the parents, or of one parent, is to be seen as a risk factor for the children's own smoking behaviour (Paavola, Vartiainen & Puska, 1996), although not

all studies agree on this. In some studies, for example, no correlation at all is found between parental smoking behaviour and children's smoking behaviour (Conrad, Flay & Hill, 1992). In other studies the link is only to the smoking behaviour of one parent (Hops, Tildesley, Lichtenstein, Ary & Sherman, 1990).

The influence of the peer group (same-age group) on the consumption of psychotropic substances in general has been demonstrated in a number of studies. Peer-group influence is one of the strongest predictors of substance consumption in general (Bauman & Ennett, 1996). Peer-group influence also appears to be stronger than parental influence (Newcomb & Bentler, 1986). These correlations have also been demonstrated for smoking behaviour (Hanewinkel, Ferstl, & Burow, 1993; Künzel-Böhmer, Bühringer & Janik-Konecny, 1993; Sussman, Dent, Burton, Stacy & Flay, 1995; Sussman Dent, McAdams, Stacy, Burton & Flay, 1994; Sussman, Dent, Stacy, Burciaga, Raynor, Turner et al., 1990; Sussman, Dent, Stacy, Hodgson, Burton & Flay, 1993; Stacy, Sussman, Dent, Rurton & Flay, 1992; Øygard, Klepp, Tell, & Vellar, 1995; Swaim, Oetting & Casas, 1996; Wahlgren, Hovell, Slymen, Conway, Hofstetter & Jones, 1997; Warheit, Biafora, Zimmerman, Gil, Vega & Apspori, 1995). According to these studies, smoking adolescents have many more smoking friends than non-smokers. A Scandinavian study by Aarø, Hauknes & Bergland (1981) shows that in cases where all persons in the immediate circle smoke (father, mother, siblings and friends) and smoking is not punished, 90% of 15-year-old boys smoke, whereas only 3% of 15-year-old boys smoke in cases where none of their immediate circle smoke and smoking is punished.

A recent meta-analysis by Sieber (1993, 1995) of 79 longitudinal studies concerning the consumption of legal and illegal drugs shows, with regard to tobacco consumption, that the consumption behaviour of friends must be viewed as the strongest predictor.

In school prevention programmes this influence of consuming peers is tackled from a behavioural angle and, through role-playing for example, techniques for resisting the offer of cigarettes are taught (Hanewinkel, 1997). These interventions have proved helpful in a whole series of studies (Bruvold, 1993; Bruvold & Rundall, 1988; Flay, 1985; Hansen, 1992; Tobler, 1986; Wiist & Snider, 1991). This applies also to more complex programmes which not only teach adolescents resistance techniques but also promote development of their personal and social skills (training programmes to promote life skills: Birrel-Weisen, 1997; Botvin, Dusenbury, Baker, James-Ortiz, Botvin & Kerner, 1992; Burow & Hanewinkel, 1994; Hanewinkel, Burow, Böttcher, Petermann & Ferstl, 1993; Hanewinkel, Ferstl & Burow, 1995; Hanewinkel, Petermann, Burow, Dunkel & Ferstl, 1994). The results of these preventive intervention studies support the hypothesis that the peer-group behaviour is of great significance in the initiation phase of cigarette consumption.

### **Quality of social relationships within the family and at school**

Various studies have shown that lack of closeness between parent and child is a risk factor for later drug consumption (Brook, Brook, Gordon, Whiteman & Cohen, 1990; Kandel, Kessler & Margulies, 1978). Children from dysfunctional families are more likely to develop delinquency and drug problems (Penning & Barnes, 1982). In contrast, positive family relationships can prevent drug consumption (Jessor & Jessor, 1977; Jessor, 1993, 1997) and social support from the family is a preventive influence (Newcomb, 1994; Newcomb & Bentler, 1988 a,b; Newcomb & Bentler, 1989). On the other hand, family conflicts and parental drinking correlate positively with children becoming smokers in adolescence (McGee & Stanton, 1993).

Poor integration into school (poor commitment) and a bad climate at school also appear to be risk factors for substance consumption (Kelly & Balch, 1971). In contrast, good commitment at school correlates with a lower likelihood of risk behaviour (McBride, Curry, Cheadle, Anderman, Wagner, Diehr & Psaty, 1995). Charlton and colleagues (Charlton & Blair, 1989; Charlton, While & Kelley, 1997) have also demonstrated a positive correlation between smoking and playing truant.

## 4.2 Personal factors

### Genetic hypotheses and personality factors

Suggestions have been made that smoking behaviour could to some extent be genetically determined, based on studies showing that people with blood group B are less often smokers than persons with other blood groups, and that left-handers are relatively more often smokers than right-handers (Tölle & Buchkremer, 1989). More meaningful than these types of correlative studies are studies of twins. Studies of identical and non-identical twins brought up together and separately are the ideal way of investigating the effect of genetic and/or environmental factors. Recent studies of identical and non-identical twins (Boomsma, Koopmans, van Doornen & Orlebeke, 1994; Carmelli, Swan, Robinette & Fabsitz, 1992; Heath & Madden, 1995; True, Heath, Scherrer, Waterman, Goldberg, Lin et al., 1997) conclude that the genetic influence is much stronger with regard to continuation of smoking, in the sense of a higher probability of forming a nicotine habit, than with regard to initiation into smoking, in which psychosocial processes play an especially significant role.

Eysenck (1965), as one of the first researchers in this field, propounded the theory that smoking could be hereditary. He assumes a complex interaction between particular personality traits, in particular extroversion, and smoking. Specifically, he suspects that smokers are more extrovert than non-smokers. In contrast to introverts, who can find satisfactory stimulation within themselves, extroverts actively seek a higher level of excitement, and this makes them more liable than introverts to consume substances, including cigarettes. This theory has been investigated many times and has frequently been criticised. Today's view is that it is erroneous to speak in terms of a specific smoker personality and that causal interpretations should not be attempted (Brenzelmann, Reig & Müller, 1984), if only because no causal connections can be deduced from correlative connections between individual personality traits and smoking behaviour.

Integrative neurobiological theories concerning substance consumption have recently been proposed by Cloninger (1987; Cloninger, Svrakic & Przybeck, 1993; Preuß, Schröter & Soyka, 1997) and Zuckerman (1993, 1994). Zuckerman's construct, "sensation seeking", is defined as a personality trait and embraces the search for new, complex, varying and intensive experiences, coupled with a readiness to take risks. At the neurochemical level, low amounts of the neurotransmitters noradrenalin, serotonin and monoaminooxidase (MAO) are assumed, accompanied by increased dopamine activity. Correlations have been demonstrated between personality and various forms of problem behaviour such as criminality, frequent change of sexual partners and substance consumption and dependence.

Zuckerman, Ball and Black (1990) have investigated the link between “sensation seeking” and smoking status, showing that smokers fall into the “sensation seeking” group much more frequently than can be attributed to pure coincidence.

Prospective investigations into the predictability of the “sensation-seeking” construct as a risk factor for taking up smoking have, however, not yet been published (Bardo & Mueller, 1991; Donohew, Lorch & Palmgree, 1991).

## **Age**

In the epidemiology section (Chapter 3) we demonstrated that there is a critical period for initiation into tobacco consumption, which occurs around the age of puberty (Tschann, Adler, Irwin, Millstein, Turner & Kegeles, 1994). For example, the risk of starting smoking and developing a regular smoking habit after the age of 20 is low (Paavola et al., 1996; Stanton, Silva & Oei, 1989). Adolescence is the stage of life that marks the transition from childhood to adulthood. The adolescent has to cope with somatic changes due to an endogenous and biological maturing process, as well as mental and psycho-social processes such as changing perceptions of his/her own body, the search for an identity, the development of a system of values and adoption of the sex role (Adams, Montemayor & Gulotta, 1996; Renschmidt, 1992). During this phase, parental influence declines and peer-group pressure becomes more and more significant.

## **Knowledge, attitudes and perceptions**

The public is very well informed about the negative health effects of smoking, as evidenced by a survey of around 16 000 Europeans which showed that almost all of them knew that smoking causes cancer (European Commission, 1995; Steptoe, Wardle, Smith, Kopp, Skrabiski, Vinck & Zotti, 1995). Various studies into the effectiveness of school information campaigns about smoking show that simple presentation of facts improves knowledge and occasionally also influences attitudes towards tobacco, but that these changes do not lead to any reduction in consumption or prevention of smoking (Bangert-Drowns, 1988; Botvin, 1995, 1996; Bühringer, 1994; Glynn, 1989).

It has been shown repeatedly that the first experiment with substances goes hand in hand with a positive attitude towards the consumption of these same substances (Krosnick & Judd, 1982; US Department of Health and Human Services, 1994). In addition, studies of adolescents have shown clearly that those who already smoke or who wish to smoke in the future over-estimate the percentages of smoking adults and adolescents to a much higher degree than do their non-smoking peers (Leventhal, Fleming & Glynn, 1988). It has shown that children and adolescents have erroneous ideas about the prevalence of smoking: those in school grades 4 to 12 (i.e. roughly 10 to 18 years old) estimate the percentage of adults who smoke to be two or three times higher than the true figure (Leventhal & Keeshan, 1993).

## **Behaviour intentions**

There is a strong correlation between the intention to smoke and subsequent smoking, as shown in a number of studies (Ary & Biglan, 1988; Bauman, Fisher, Bryan & Chenoweth, 1994; Conrad et al., 1992; Paavola, et al., 1996; Shean, de Klerk, Armstrong & Walker, 1994).

## **School performance and failure at school**

Both actual and self-perceived good performance at school correlate negatively with later tobacco consumption (Bauman et al., 1994; Conrad et al., 1992). A whole series of studies have shown failure at school to be a risk factor for later consumption of substances (Jessor,

1976; Robins, 1980; Hawkins et al., 1992), while the likelihood of this is much lower for those who cope well at school (Hundleby & Mercer, 1987).

### **Sense of personal worth**

The general sense of personal worth seems to have no direct bearing on initial experimentation with substances by adolescents (Dolcini & Adler, 1994; Michell, 1997). The correlations found are numerically small (White, Johnson & Horwitz, 1986). Petraitis, Flay and Miller (1995) report on 10 longitudinal studies, none of which were able to demonstrate any such correlation. Clayton (1992) attempts to explain this by suggesting that the sense of personal worth was perhaps erroneously operationalised and perhaps even erroneously conceptualised. According to this, the adolescent's sense of personal worth is anchored more in situational contexts than the adult's and may therefore be extremely variable.

Bertrand and Abernathy (1993) conclude that interpersonal variables such as peer influence are better predictors of smoking status than intra-personal variables such as the general sense of personal worth.

### **Previous experimentation and early commencement of consumption**

Early commencement of consumption is one of the strongest predictors for the development of a regular smoking habit (Kelder, Perry, Klepp & Lytle, 1994). Previous experimentation with tobacco also correlates positively with later, regular consumption (Chassin & Presson, 1990; Newcomb, 1992; Stacy, Bentler & Flay, 1994).

### **Correlations with other health-relevant behaviours**

A whole series of different studies have shown a strong positive correlation between consumption of tobacco and consumption of alcohol and/or illegal drugs, i.e. when alcohol or illegal drugs are consumed the probability of tobacco consumption rises, and vice versa (Newcomb & Bentler, 1986, 1988a,b; Nutbeam, 1997; Pohjanpää, Rimpelä, Rimpelä & Sarvonen, 1997). According to the "Drug affinity study" (BZgA, 1994), which investigates the consumption behaviour of adolescents and young adults, two-fifths (42%) of regular smokers have tried illegal drugs at least once, as have 24% of occasional smokers and 23% of ex-smokers, but only 3% of never-smokers.

## 5. Advertising strategies

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Building on an analysis of the goals pursued by tobacco advertising, this chapter describes and reflects critically on the advertisers' methods, strategies and messages.

### 5.1 Advertising goals

According to Eicke (1996) and the 1989 US Surgeon-General's Report, the tobacco industry uses cigarette advertising for the following goals:

1. To encourage non-smokers (especially children and adolescents) to begin smoking, i.e. not just to experiment with smoking but to become habitual smokers.
2. To encourage regular smokers to increase their daily dose.
3. To weaken smokers' motivation to stop smoking, so as to ensure that they do not embark on any attempts to quit.
4. To encourage ex-smokers to resume the habit.
5. To soften the trend whenever sales start to decline.

Apart from these goals, which are all directly concerned with increasing turnover, additional goals are to give cigarette smoking a positive image and to increase its social acceptance (Eicke, 1992; Lynch & Bonnie, 1994).

The tobacco industry itself, on the other hand, claims firstly that all tobacco advertising and promotion is aimed exclusively at adults and secondly that the sole aim is to persuade existing smokers to switch brands.

The two sides of the argument are weighed against each other in this report.

### 5.2 Advertising methods

The tobacco industry employs a broad spectrum of direct and indirect forms of advertising, referred to in their totality as a "marketing mix".

According to Eicke (1992), advertising activities include:

- Direct advertising: advertisements, posters, filmed commercials, product placement, sales promotions and trial packages.
- Indirect advertising (brand stretching): brand transfer (the name of the brand appears on other products), sponsoring of cultural, musical and sporting events, public relations, free gifts and prize competitions.

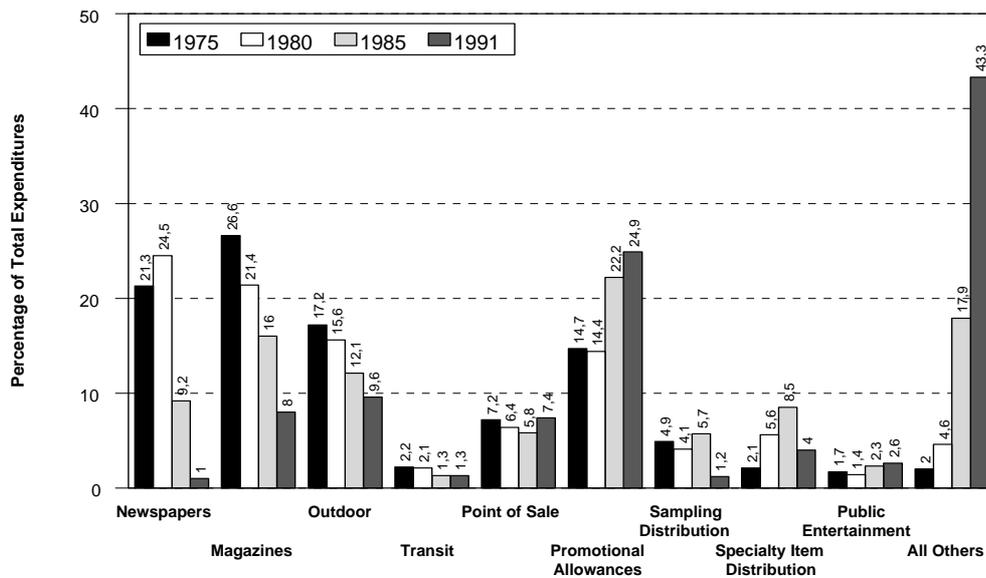
A marketing mix strategy combines these different types of activity to achieve a synergistic effect. Advertisements, posters and commercials have the function of conveying the crucial images, positioning the brand in the targeted social area, and guaranteeing long-term continuity of the publicity (Eicke, 1992).

Promotions have three goals:

1. to make sure that tobacco products get into the hands of future users,

2. to place tobacco products at attractive points of sale in shops, and
3. to create a friendly climate for the tobacco industry among the general public and politicians.

Over the past 20 years in the USA there has been a sharp decline in the proportion of the publicity budget spent on advertisements, and a corresponding increase in spending on promotions (Bartecchi, MacKenzie & Schrier, 1995). This trend is clearly seen in Figure 8.



**Figure 8.** Advertising expenditure and expenditure on cigarette promotions in the USA, broken down by media. "All others" = coupons, bonus offers (retail value-added items), direct mailing, audiovisual advertising (Lynch & Bonnie, 1994).

The most important forms of marketing are:

1. Value-added promotions in shops (e.g. buy one packet, get one free), vouchers (e.g. Camel Cash; Richards, DiFranza, Fletcher & Fischer, 1995; Slade, 1993); promotional articles such as T-shirts, caps and sports articles bearing the brand logo.
2. Promotional allowances for tobacconists who, for example, carry many brands and place particular ones in a prominent position in the shop.
3. Point of sale advertising through the provision of special showcases, shelving and other materials.
4. Advertisements in magazines and newspapers, often combined with a chance to obtain free gifts or vouchers.
5. Outdoor advertising on billboards or public transport (transit system signs).
6. Sponsorship of sports events such as Formula 1 racing (Chapman, Cohen, Nelson & Woodward, 1993), music concerts, art exhibitions, etc.
7. Distribution of free trial packages.
8. Direct mailing to potential customers through mailing lists.

Additional measures are concerned with preventing the dissemination of anti-smoking information. Numerous studies have shown that magazines that carry lots of cigarette advertising very seldom carry articles about the health risks of smoking (Amos, Jacobson & White, 1991; Minkler, Wallack & Madden, 1987; Whelan, Sheridan, Meister & Mosher,

1981). This applies especially to women's magazines, as shown in the study by Warner, Goldenhar and McLaughlin (1992), the main findings of which are summarised in Table 2.

**Table 2.** *Number of articles on health and smoking, in relation to the presence of cigarette advertising in magazines (Warner et al., 1992).*

Magazines	Number of magazine issues analysed	Percentage of publications reporting on the health risks of smoking (%)
<b>All magazines</b>		
No cigarette advertising	403	11,9
Cigarette advertising	900	8,3
<b>Women's magazines</b>		
No cigarette advertising	104	11,7
Cigarette advertising	212	5,0

### 5.3 Advertising strategies

The tobacco industry claims officially: "Kids 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, cited by Pollay, Siddarth, Siegel, Haddix, Merrit, Giovino, & Eriksen, 1996).

The claimed objective therefore is, through advertising, to persuade adults to switch loyalty to another brand.

Brand switching and brand loyalty are concepts from the product-lifecycle typology for a saturated market (mature market; McDonald, 1992). However, there is no indication in the tobacco industry's own published documents and research reports that the industry's own strategic analyses and strategies are based on this typology (Pollay, 1997). This applies equally to product class (e.g. cigarettes), form (e.g. filter cigarettes) and brand.

Empirical evidence to support the saturated market model (e.g. declining profits and reduced advertising expenditure) is yet to emerge (Pollay et al., 1996; US Department of Health and Human Services, 1994). Additionally, American advertising campaigns for a specific brand have never yet named the competitor from whom it is hoped to wrest market share. Such a strategy would be typical, however, if the product were genuinely in a saturated market (Pollay, 1997).

Another factor that militates against applying the product-lifecycle typology to tobacco goods is the fact that the tobacco industry has particular marketing problems to contend with, since tobacco causes dependency and can lead to fatal diseases. Since the tobacco market is dominated by a small handful of giant companies, the structure can be said to be oligopolistic (Pollay, 1997).

A saturated market would be relatively stable. But this is not the case with the tobacco market. The dynamic is caused by the fact that there is a continuous process of smokers quitting and smokers dying, and new smokers therefore need to be recruited in order to keep sales at least stable. According to Lynch and Bonnie (1994), 3 500 Americans quit smoking each day. A further 1 200 current or ex-smokers die each day from smoking-related

illnesses. To counterbalance these losses, the industry needs to find almost 5 000 new smokers each day, or 2 million each year.

Adolescents form the easiest target group from which to recruit new smokers. The vast majority of smokers were still minors when they began smoking (Pollay, 1997).

If advertising had no effect on recruiting new smokers, then, according to Pollay (1997), the tobacco industry should logically welcome a ban on advertising, since this would save them the vast amounts they currently spend on advertising. Such a ban would also help to freeze market shares at the current levels. The largest companies should therefore logically be leading the way in this self-imposed restriction.

According to Junge (1997) 151 million DM were spent in Germany in 1996 on brand advertising for cigarettes, including spin-off products, while over 6 billion US \$ were spent on advertising and promotion by the tobacco industry in the USA in 1993. This is such a huge amount that it is unlikely it was spent only to persuade existing smokers to switch brands. Siegel, Nelson, Peddicord, Merrit, Giovino and Eriksen (1996) estimate the total profits generated from brand switchers in 1987 at 362 million US \$, in other words a relatively paltry sum compared with the total advertising spend.

Of all categories of consumer goods, brand loyalty is highest for cigarettes. The rate at which brands are switched lies below 10% (Siegel et al., 1996). Part of this switching occurs within the same brand family, e.g. from the "standard" to the "light" variety. This has no effect on the company's net profits. The extent to which the cigarettes of a particular brand satisfy the smoker's nicotine need throughout the smoker's developing or existing physical and psychological addiction to nicotine is a major contributory factor to brand loyalty. The barrier of brand loyalty must first be overcome by other brands.

Additionally, brand switchers represent a relatively unattractive segment of the market. They differ from beginners in being older, more concerned for their health, and thus less committed to smoking. (Pollay, 1997).

Adolescents, as new consumers who will later become dependent and loyal to a brand, have a higher expected net present value than brand-switchers. For the tobacco industry, therefore, it is much more attractive to set their sights on recruiting young people as beginners than to focus on brand-switchers (Coeytaux, Altman & Slade, 1995; Pollay et al., 1996).

Tobacco industry documents show that the industry focuses unremittingly on adolescents, since that is the age when the smoking career begins (Pollay et al., 1996). Pollay and Lavack (1993), for example, cite the following passages from internal tobacco industry documents: "Young smokers represent the major opportunity group for the cigarette industry." "If the last ten years have taught us anything, it is that the industry is dominated by the companies who respond most effectively to needs of younger smokers" (Pollay & Lavack, 1993, p. 267).

As market research activities, strategy documents and media plans reveal, the tobacco industry has been interested in young consumers for many decades (Glantz, Slade, Bero, Hanauer & Barnes, 1996; Pollay & Lavack, 1993; Pollay, 1995a; US Department of Health and Human Services, 1994). Targeted measures have included siting billboards near schools and shopping centres, running commercials on TV and radio at teenagers' peak

viewing/listening times (Pollay 1994a,b), offering special items with the company's logo, conducting research into the behaviours, attitudes and needs of children and adolescents, targeting advertising campaigns specifically at children and adolescents, and marketing brands for beginners (starter brands). The use of varied forms of advertising, the so-called marketing mix, is one of the long-term strategic programmes for reaching young people (Pollay et al., 1996).

The 1994 report by the USA's Minister for Health, Mrs M. Joycelyn Elders, describes a number of campaigns that were deliberately aimed exclusively at young people, such as the Youth Target Study '87 by R.J. Reynolds-MacDonald (see also Pollay & Lavack, 1993; US Department of Health and Human Services, 1994) or the USA campaign begun by Camel in 1988 featuring the human/animal cartoon figure "Old Joe" (DiFranza, Richards, Paulman, Wolf-Gillespie, Fletcher Jaffe & Murray, 1991; Lynch & Bonnie, 1994). Documents concerning the Youth Target Study '87 and other tobacco industry studies of the smoking behaviour of young people came to light for the first time during the court case regarding the constitutionality of the advertising ban in Canada (Imperial Tobacco Limited & R.J. Reynolds-MacDonald Inc. vs. Le Procureur Général du Canada). They were described in detail in Pollay and Lavack (1993). These publications and documents provide clear evidence that children and adolescents constitute an important target group for the tobacco industry (see also King, Siegel, Celebucki & Conolly, 1998).

## **5.4 Advertising messages**

Advertising focuses on conveying visual and non-verbal information. In this way, cognitive argument and logical analysis, e.g. in the form of argument and counter-argument, are minimised. The trick is to trigger positive associations (Pollay, 1997). The message can be aimed either at individuals or at the peer group (Eicke, 1992).

Image-based advertising speaks particularly strongly to children and adolescents. According to Lynch and Bonnie (1994), five themes dominate tobacco advertising:

### **1. Smoking as an expression of independence**

The adolescent's need for independence is bound up with other needs such as the need for self-assurance, social recognition, liberation from pressure from authorities, and adventure-seeking. A prototype for the theme of independence is the Marlboro Man (Pollay, 1997). The basic cravings for freedom and independence apply equally to both male and female adolescents.

The theme of independence appeals in particular to adolescents who are deviant, whether in a constructive way (high self-esteem, autonomy, independence) or a destructive way (low self-esteem, reactant non-conformity) (Chassin, Presson, & Sherman, 1989).

### **2. Smoking as a rite towards adulthood**

Symbols and themes of adulthood, such as adventure, crass individualism, independence, sophistication, glamour and sexuality are highly attractive to adolescents (Goebel, 1994; Pollay & Lavack, 1993; Pollay, 1997). In image-based advertising, smoking is associated with these concepts in such a way that smoking itself becomes an indicator of adulthood and pleasure and there is an enormous temptation to imitate the characters portrayed. Depending on the image aimed at by the advertisers, the models employed appear particularly youthful or adult, such as the Marlboro Cowboy. Part of

image-based advertising particularly favours symbols of manhood (Pollay, 1995b; Hirschman, 1995).

### **3. Smoking to promote social interaction**

Smoking is often extolled as a means of facilitating social contacts and acceptance by the peer group. During the phase of identity formation, making social contacts does indeed have great importance, but is often linked with intense feelings of insecurity. Images that portray smoking as a vehicle to guarantee easy belonging therefore speak particularly strongly to adolescents.

### **4. Smoking as the norm**

By linking smoking to everyday activities, events and places, the impression is conveyed that smoking is normal, ubiquitous and socially acceptable. Advertising often depicts smoking taking place in routine activities and during transitional phases in the normal daily routine, e.g. in the coffee break or during drinks after work.

### **5. Smoking and health**

For at least 60 years health has been a theme of cigarette advertising. The adverts often convey an image of health, portraying bold and dynamic behaviour in a pure, natural environment. By associating smoking with fit and healthy people shown performing the most diverse activities in the clear fresh air, the advertisers suggest that smoking poses no danger to health.

The tobacco industry constantly uses images and words such as "mild", "light", "fresh", "pure" and "natural" in order to reassure smokers and potential smokers and divert attention from the health risks. The same purpose is served by the descriptions of the materials and functions of filter tips, which have been regularly re-designed over the years so as allegedly to reduce tar and nicotine.

## **6. Models for measuring the effect of advertising on smoking commencement**

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In this chapter we present a number of models and theories with regard to smoking commencement, and we attempt to work out the possible influence of advertising. To this end, we begin by describing the theories and models in general terms, as well as empirical studies which have been used to verify the models or particular elements of the models. We then use the models in an attempt to provide a better understanding of the potential influence of advertising.

Models from the world of communication theory have proved very useful for describing the effects of advertising. They describe a sequence of stages, beginning with initial temptation and ending with conversion of the temptation into action. The central concepts, applied to tobacco products, are: perception, recognition, recall of the advertising message; the feelings, cognitions and motivations triggered; the intention to purchase and the actual purchasing behaviour of adolescents (Baacke, Sander & Vollbrecht, 1993; Britt, 1979).

From the psychological perspective, cognitive and emotional processes are the main processes that help to explain how advertising influences consumer behaviour (Lynch & Bonnie, 1994). Advertising endeavours, via cognitive processes, to persuade the potential consumer of the benefit of the product, whether this benefit be in terms of satisfying particular needs or of attaining an ideal self-image. The emotional reaction to a product goes back in part to conditioning processes, which are channelled through positive affective reactions to the advertising.

These conditioning processes keep alive the positive message of the advertisement (Lynch & Bonnie, 1994). The affective component of the advertisement often works unconsciously and automatically and is revealed, for example, when a person identifies a particular advertisement as his/her "favourite" (Zajonc, 1980).

### **6.1 Cognitive-affective models**

There are numerous different model approaches that address the question of how convictions and assumptions about the consequences of smoking influence the actual smoking behaviour of adolescents, focusing in particular on questions such as how the perceived advantages and disadvantages of smoking contribute to the adolescent's decision to experiment with smoking.

Two very influential theories have been published by Ajzen and Fishbein (1980; Fishbein & Ajzen, 1975; Ajzen, 1988). These are the "theory of reasoned action" and the "theory of planned behaviour". For both theories it is difficult to produce an appropriate German translation. Jonas and Doll (1996) propose as German equivalents the terms "Theorie des überlegten Handelns" and "Theorie des geplanten Verhaltens", and these are the terms we have used in this report. Both were developed as theories for predicting general behaviour rather than specifically for predicting tobacco consumption, although they have been used repeatedly for such prediction (Marcoux & Shope, 1997).

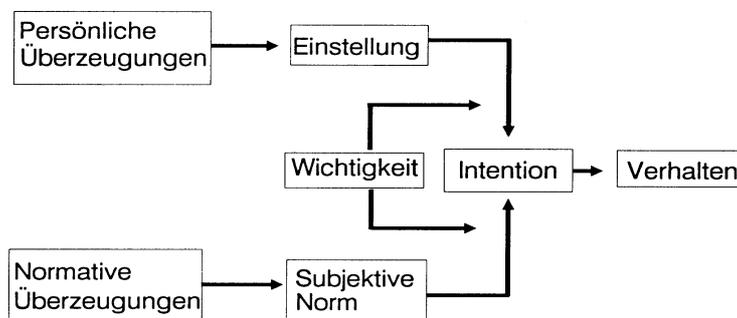
## Theory of reasoned action

The theory of reasoned action assumes that people act in accordance with their intentions. Therefore an overt form of behaviour is significantly determined by the behaviour intention and can accordingly be predicted by the behaviour intention, with the assumption that, the more specifically the behaviour and the underlying intention are formulated, the more accurate the prediction will be.

According to this theory, the decision by adolescents to experiment with smoking can be attributed to two cognitive determinants:

1. Substance-specific attitudes: These result from the mathematical product of the personal consequences (cost/benefit) that the adolescents expect from cigarette consumption, and the affective value that they assign to these consequences. Accordingly, adolescents should develop positive attitudes towards smoking if the expected benefits of smoking exceed the expected costs. These substance-specific attitudes of adolescents have a major influence on their intention to smoke or not to smoke.
2. Social/subjective norms: Formation of the behaviour intention is also influenced by social norms associated with the consumption of a substance. These normative convictions are based on the subjective perception that persons to whom the adolescent most closely relates wish him/her to consume the substance, and on the motivation to comply with these perceived wishes. Adolescents feel much more pressure to smoke when significant friends and family members support smoking.

This model is depicted in diagrammatic form in Figure 9.



**Figure 9.** Theory of reasoned action.

Key to <b>Figure 9:</b> Theory of reasoned action	
Original text	Translation
Persönliche Überzeugungen	Personal convictions
Einstellungen	Attitudes
Normative Überzeugungen	Normative convictions
Wichtigkeit	Importance
Subjektive norm	Subjective norm
Intention	Intention
Verhalten	Behaviour

The strong positive correlation between the intention to smoke and actual smoking behaviour has been demonstrated in a series of studies and corresponds to the model prediction (see Chapter 4).

According to the theory of reasoned behaviour, group norms play an important role in the generation of behaviour intentions and overt forms of behaviour. Normative convictions can lead to risky behaviour if the person concerned assumes that the intended form of behaviour is desirable, acceptable or safe (Jemmott, Ditto & Croyle, 1986). This can lead to distorted perceptions and erroneous conclusions, such as over-estimating the prevalence of smoking.

Sutton (1989) reviews a total of 10 studies that have applied the theory of reasoned behaviour to smoking and comes to the conclusion that, while the findings essentially match the theory, the connections are often very tenuous. This could be partly due to the fact that these were cross-sectional studies rather than the longitudinal studies really needed in order adequately to test the power of prediction of the theory.

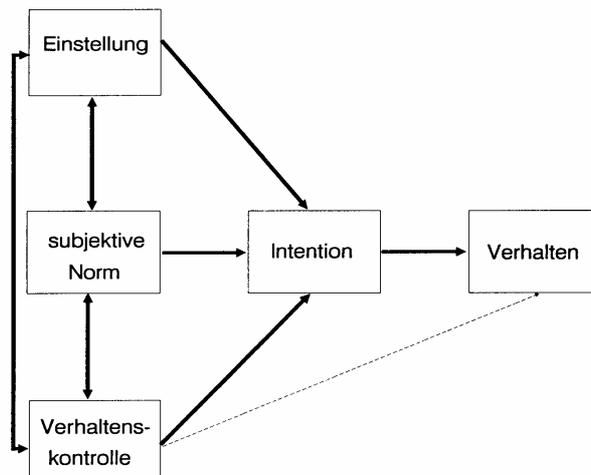
A longitudinal study to predict adolescent smoking behaviour was conducted by Stacy et al. (1994). They surveyed a total of 199 schoolchildren in the eleventh school grade (i.e. age roughly 17) at two different points in time (12 months apart), with regard to their actual smoking behaviour and their associated cognitions. It was shown that at each of the points in time (t1 and t2) there was a strong positive correlation between the actual behaviour and the cognitions, but that it was not possible to predict the actual smoking behaviour at t2 on the basis of the attitudes at t1.

Apart from the generally weak empirical confirmation of the model as a whole, a number of the model's central assumptions also appear to be questionable. The theory assumes that substance consumption can be entirely explained by substance-specific attitudes and normative assumptions, and completely overlooks the fact that other variables, such as previous experience with substance consumption, could have a direct influence on consumption. Ajzen himself (1988) has also recognised that behaviour intentions are influenced by a wider range of factors than simply attitudes and normative expectations.

### **Theory of planned behaviour**

In 1985 and 1988 Ajzen added to the theory of reasoned action an additional factor, namely the concept of perceived behaviour control (see Figure 10). According to Ajzen this variable is very similar to the concept of self-efficacy proposed by Bandura (1982, 1992). However, clear differences are evident in the operationalisation of Bandura's self-efficacy and Ajzen's behaviour control. While Bandura's competence expectation represents a person-action-result expectation, i.e. it considers the question of the subjectively available effective action, Ajzen's concept considers both the question of the personal competences and the perceived behaviour barriers. This concept of behaviour control is claimed to exert a direct influence both on the behaviour intention and on the behaviour itself. The direct influence on the intentions is such that persons who have little confidence in their own capabilities, or who conversely have absolute confidence in their own capabilities, but who see the intended behaviour, with all its consequences, as being outside their control, will not form any intention to manifest this behaviour, even if they have a positive attitude towards the behaviour and feel a normative pressure to practice the behaviour.

If a person actually lacks certain resources in a concrete situation, that person will also not manifest the behaviour, however strong the intention might have been. This illustrates the postulated direct influence of behaviour control on behaviour.



**Figure 10.** Theory of planned behaviour

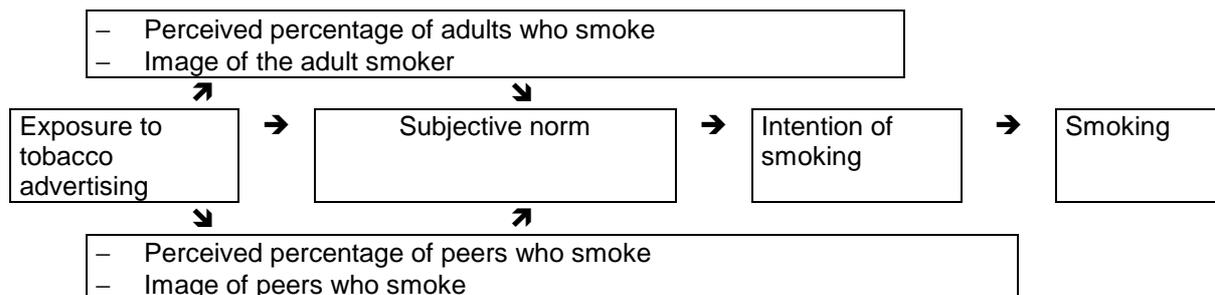
Key to <b>Figure 10.</b> Theory of planned behaviour	
Original text	Translation
Einstellung	Attitude
Verhaltenskontrolle	Behaviour control
Subjektive norm	Subjective norm
Intention	Intention
Verhalten	Behaviour

The described approach was further developed by DeVries, Dijkstra and Kuhlmann (1988), the somewhat diffuse concept of controllability being dropped and being explicitly replaced by Bandura's concept of competence expectation. In applying this modified theory to the experimental consumption of substances, a distinction can be made between two forms of self-efficacy:

1. "use self-efficacy": The conviction of having sufficient ability to obtain the substances in question and to be able to use them.
2. "refusal self-efficacy": The conviction of being able to withstand social pressure to consume the substances in question.

In a series of publications these authors showed that the second form of self-efficacy makes a significant contribution to the prediction of adolescent cigarette consumption (DeVries, Kok & Dijkstra, 1990; Kok, DeVries, Muddle & Strecher, 1991; Kok, Boer, De Vries, Gerads, Hospers & Mudde, 1992).

If the cost-benefit and decision theories of Ajzen and Fishbein are applied to the possible influence of advertising on smoking commencement, a correlation as portrayed in Figure 11 can be postulated.



**Figure 11:** *Effects of advertising, according to the theory of reasoned action and the theory of planned behaviour.*

Exposure to tobacco advertising therefore leads to erroneous perceptions about the percentages of adults and adolescents who smoke. This over-estimation of the extent of smoking in the population can in turn influence adolescents into thinking that cigarette smoking is desired in society in general and among adolescents in particular and represents the rule rather than the exception. Moreover, it can be assumed that advertising positively influences the image of smokers, which in turn, in conjunction with processes of learning from models, leads to a higher probability of the formation of the subjective norm that smoking is desirable. This subjective norm should in turn, according to the theory of planned behaviour and the theory of reasoned action, increase the intention of smoking, which in turn correlates highly with actual smoking behaviour.

To sum up, the theory of planned behaviour explains the intention to act as the result of attitudes with regard to the action and of normative convictions. Fishbein showed that advertising directly influences social norms among adolescents. These are norms which determine what it means to be a smoker, and normative influences which are conveyed via peer-group pressure, namely to emulate the behaviour of models portrayed in advertising. The author states "there can be little question that cigarette ads attempt to create a positive image of the smoker" and concludes "our review suggests that cigarette advertising does affect cigarette consumption" (Fishbein, 1976, cited in Lynch & Bonnie, 1994, p. 118).

## 6.2 Learning theory models

An understanding of the development and maintenance of tobacco consumption is not possible without learning theory mechanisms. The following learning theory assumptions have been discussed time and again in this context:

1. classical conditioning
2. operant conditioning
3. learning from models – social-cognitive learning theory.

The observations already made concerning the psychosocial risk factors associated with smoking have shown that those persons to whom children and adolescents most closely relate have a substantial influence on the time at which children and adolescents first try smoking. The influence of various models, such as parents, teachers, and especially same-age friends, is documented extraordinarily well in the literature. The process of learning from models is therefore very likely.

The first cigarettes ever smoked do not taste good. Indeed, they often produce negative effects, such as coughing, queasiness and even nausea. Despite this, many children and adolescents make intensive efforts to master smoking, and only a few are deterred in the

longer term by their first negative experiences. There are obviously strong motivational reasons spurring them on. Operant learning mechanisms play a role here. For many children and adolescents, the starting point for the first attempt at smoking is a high-risk situation, often a group-pressure situation, in which the other group members smoke and the child in question wants to belong to the group and not be excluded. Children are very often aware of the harmful health consequences of smoking, but they are not deterred by these since any health damage will not be apparent until far into the future. The short-term negative consequences that can be caused by feeling unwell after smoking deter only a fraction of the children, while the immediate positive consequences, such as stress reduction or the establishment of social contacts, enormously reinforce smoking behaviour and far outweigh the negative consequences in their affective valency.

A further operant learning mechanism in the course of the individual's subsequent smoking career is negative reinforcement, in the sense of the suppression or total avoidance of withdrawal symptoms.

Advertising too uses classical and operant conditioning processes. For example, the smokers shown in adverts are successful, good-looking, young and healthy. Smoking, therefore, is associated with positive models and their positive attributes (classical conditioning). This model effect is also underlined by the fact that, in the adverts, the act of smoking is seen to bring positive results (operant conditioning).

If Bandura's social-cognitive learning theory (1986) is applied to smoking initiation, it can be postulated that adolescents get their convictions and attitudes regarding tobacco from models and even their normative convictions are substantially modified by models.

It is assumed that social intercourse with close friends and family members who smoke strengthens two convictions, namely the consequence expectation and the competence expectation:

1. The observance of models who consume substances directly influences the result expectations, i.e. the expectations concerning the social, personal and physiological consequences of consuming such substances. For example, observing parents who smoke or drink alcohol for relaxation will promote similar attitudes and expectations in the observer regarding the consequences of his own consumption.
2. Observation of models influences both "use self-efficacy" and "refusal self-efficacy" (Bandura, 1977, 1982, 1992). For example, by observing others purchase and smoke cigarettes adolescents can acquire the necessary knowledge for obtaining and using tobacco products themselves ("use self-efficacy"). In contrast, observing a close friend decline a proffered cigarette can reinforce "refusal self-efficacy" to the extent that the adolescent himself is able to decline a similar offer.

Social-cognitive learning theory cites two influential factors for the first consumption of cigarettes:

1. cigarette consumption by those closest, especially good friends and parents, but also by other role models, and
2. the attitudes towards cigarette consumption held by such role models, particularly the peer group.

These assumptions are supported by a fair amount of empirical evidence. Peer-group influence on smoking commencement has been documented in a whole series of studies mentioned in Chapter 4.

The way in which learning from models occurs in the mass media, and in which this can influence experience and behaviour, can be plausibly explained by Bandura's social-cognitive learning theory. The behaviour of models is closely imitated when such behaviour observably produces the desired benefits. In image-based advertising, smoking is portrayed as an expression of independence, individuality and sophistication. These types of message suggest to the consumer that he can achieve something by smoking that he could not achieve on his own merits. In this way the target's desired self-image is strengthened, while at the same time however his own self-efficacy is weakened. According to the social-cognitive theory, behaviour is strongly regulated by the assumption of being able to exercise control over events. The theory further assumes that the accepted consequences of an action govern one's own behaviour.

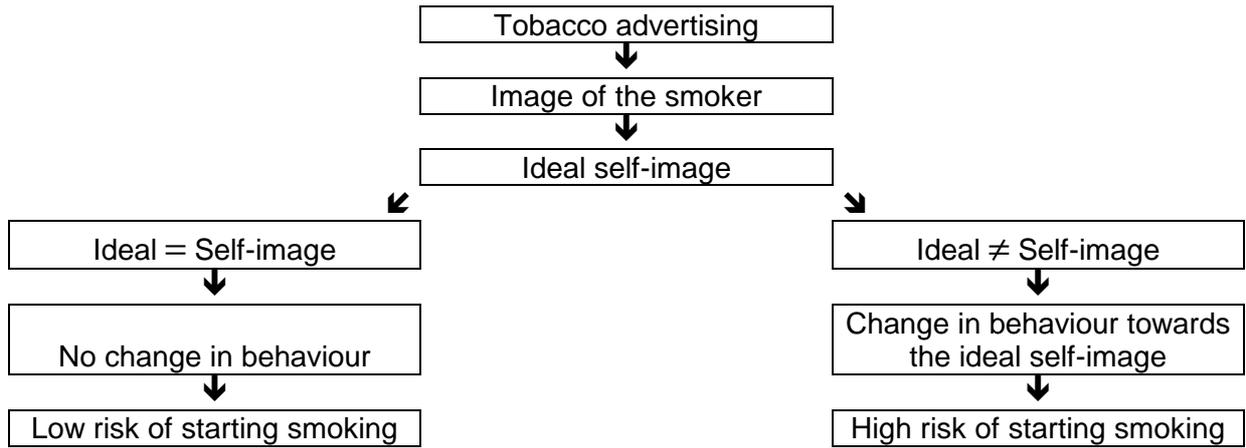
Cigarette advertising often conveys a strongly masculine self-image (Pollay, 1995b; Hirschman, 1995), showing for example how smoking reduces stress or helps the smoker to gain the admiration of friends. All the models used look very healthy and happy. This is in direct contradiction to the health-damaging consequences of smoking.

### **6.3 Shaping of self-image**

The critical period for initiation into tobacco consumption is puberty (see Chapter 4), a stage of life that imposes great demands on young people. The gradual mutation from child to adolescent is accompanied by changes in self-image. During the identity formation phase the young person experiences great uncertainty about his own self, which is not yet solidly defined. The adolescent tries out various different adult roles. The forces that help to shape self-image include not only peer-group pressure but also the examples conveyed in advertising (Lynch & Bonnie, 1994).

Burton, Moinuddin and Grenier (1991, cited by US Department of Health and Human Services 1994) see the discrepancy between the current and the ideal self-image as a trigger for the decision to start smoking. According to their model, image-based advertising conveys personality traits that adolescents themselves would like to have. These personality traits play a part in shaping the adolescent's ideal self-image. Non-concordance between the two self-images (i.e. current and ideal) motivates the adolescent to act. Advertising promises smoking as a means of approaching the desired ideal self-image.

Figure 12 illustrates the influence of tobacco advertising, pointing to a higher probability of experimental smoking when the ideal image does not concord with the self-image. The greater the discrepancy between the two, the greater the probability that the attractive model behaviour portrayed in the advertising will be adopted.



**Figure 12.** *A model for smoking initiation: Advertising shapes the adolescent's ideal self-image (US Department of Health and Human Services, 1994).*

## **7. Influence of advertising**

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We are surrounded by cigarette advertising in our day-to-day life. The extent and penetration of such advertising creates great familiarity with the products and helps cigarettes to be seen as part of our cultural heritage, thus playing down their potential harmfulness to health (Pollay, 1997).

Children and adolescents are not shielded from cigarette advertising in any way (Pollay et al., 1996). Indeed, they are massively exposed to it. This creates a social climate in which experimental smoking by adolescents can be expected. Botvin, Goldberg, Botvin and Dusenbury (1993) have shown that the greater the exposure of adolescents to advertising, the greater the probability that they will smoke.

In order to understand the effects of advertising it is important also to observe the long-term effects marking a generation (Pollay, et al., 1996). However, these effects have not yet been adequately investigated.

The influences of advertising on experience and behaviour are highly complex, as will be seen in the discussion of individual psychological processes below.

### **7.1 Perception and recall**

In research into the effects of advertising, great weight is attached to testing how and to what extent the message has reached the target group, and what feelings and cognitions have been triggered. These non-economic effects are the pre-requirements for the economic effects (which is where interest actually lies), such as the increase in consumption of a particular brand (Eicke, 1992).

An example of this type of research is a large-scale German investigation by Bergler, Haase, Humburg, Steffens and Noelle-Neumann (1995). The investigation began with a pilot study of 160 adolescents. These respondents spontaneously judged cigarette advertising as fairly neutral and as not triggering strong feelings. Adverts deploying originality, imaginativeness, humour and comedy were appreciated more than those deploying typical cigarette images. 60% of the adolescents were generally critical of cigarette advertisements, complaining that the messages were unrealistic and idealistic.

In the main study, 1 612 adolescents were given a questionnaire. The main results were as follows. Concerning level of recall of cigarette advertising in magazines or cinemas, there were no significant differences between smokers, occasional smokers and non-smokers. In magazine advertising, cigarette brands were remembered more frequently by smokers than by non-smokers. Smokers and non-smokers judged cigarette advertising equally. However, they differed in the associations that advertising triggered in them. Smokers more frequently cited associations such as "being with friends", "really enjoying something", "feeling free" and "finding relaxation and peace".

At the start of the questionnaire, the respondents were asked to give their spontaneous associations to the terms "freedom", "adventure", "relaxation" and "enjoyment". Analysis as to whether they spontaneously associated these terms with smoking showed that the smokers among the group did so for the terms "relaxation" and "enjoyment".

Children and adolescents know the advertisements better than adults (Rombouts & Fauconnier, 1988). This is revealed particularly clearly in investigations concerning the American "Old Joe Camel" campaign.

Fischer, Schwartz, Richards, Goldstein and Rojas (1991) tested 229 pre-school children aged from three to six. 30% of the three-year-olds and 91.3% of the six-year-olds correctly assigned the "Old Joe" logo to the "cigarettes" product category. The reasons for these extraordinarily high recognition rates, according to the authors, are that the children have constant exposure to strong direct and indirect cigarette advertising wherever they go.

DiFranza et al. (1991) compared 1 060 schoolchildren from grades 9 to 12 with 491 adults, using standard marketing methods. Old Joe was recognised by 97.7% of the children and 72.2% of the adults. 97.5% of the children and 57.7% of the adults were able to associate the cartoon figure with the Camel brand. Children found the cartoon figure "cooler" and more interesting and were keener to have him as a friend than adults. The results clearly demonstrate the intensive effect of this type of advertising on children. They were much more attracted to it than adults and were much more familiar with the cartoon character. In the three years of the campaign, Camel's market share among under-18s rose from 0.5% to 32.8%.

The images used in advertising have a much stronger effect on adolescents than on adults, since adolescents are still in the identity-formation phase and as such are much more sensitive to signals and symbols of adulthood. The images shown in adverts offer apparent solutions to identity problems (Lynch & Bonnie, 1994; Pollay et al., 1996).

A similarly high brand-recognition rate among 10-year-old schoolchildren was observed in a more recent study by Peters, Betson, Hedley, Lam, Ong, Wong and Fielding (1995). For example, the recognition rate for Marlboro was 95%.

Adolescents actively seek clues from their peers and from adverts as to how to behave "properly". They are interested in products which satisfy their needs for experimentation, belonging, independence, responsibility and acceptance by others (Solomon, 1994).

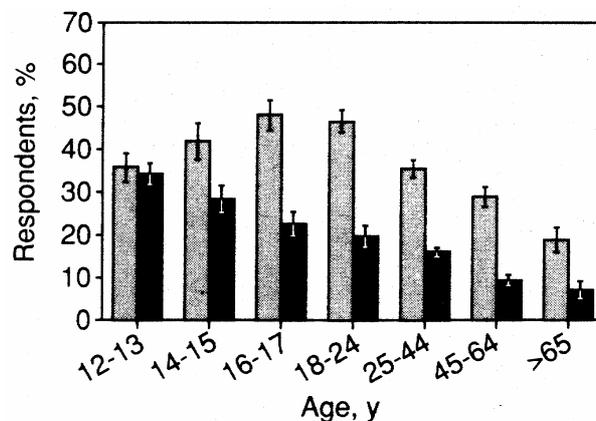
Addicted and loyal consumers selectively screen out information about health risks and competitors (Holak & Tang, 1990).

A number of studies (Aitken, Leather, O'Hagan & Squire, 1987; Goldstein, Fischer, Richards & Creten, 1987; Pierce, Gilpin, Burns, Whalen, Rosbrook, Shopland & Johnson, 1991; Pierce, Lee & Gilpin, 1994) have demonstrated a positive correlation between the ability of adolescents to recall a specific advert, logo or trademark and their intention to smoke, their commencement of smoking and their extent of smoking. According to Lynch and Bonnie, the findings cannot be interpreted causally in one particular direction. It is evident, however, that experimentation with cigarettes influences the amount of notice paid to cigarette advertising. This may in turn reinforce smoking behaviour in the way described in the sections on "Advertising messages" (Chapter 5.4) and "Effect models" (Chapter 6) (Aitken, Eadie, Hastings & Haywood, 1991).

Analysis of the data from a 1990 California survey of 5 040 adolescents and 24 296 adults showed that adolescents pay more notice to cigarette advertising than do adults (Pierce et al., 1991). 70% of the adolescents, but only 47% of the adults, named Marlboro or Camel as

the brands most frequently advertised. Broken down by age-group, Camel's highest score (34.2%) was among 12-13 year-olds, while Marlboro's (41.8%) was among 16-17 year-olds. The authors attribute the fact that Camel's highest score was among 12-13 year-olds to the advertising strategy featuring the Camel cartoon, which is aimed at very young people (Figure 13).

In addition, the market share pattern, taking account of sex and age, matched the perceived advertising pattern. Among 12-17 year-olds, Camel and Marlboro had the highest market share, together totalling 79.9%. What was particularly striking was that Camel had twice as high a market share among 12-17-year-old males as among 18-24 year-old males. The difference was even more marked in the corresponding female groups, the market share being four times higher among the 12-17-year-olds than among the 18-24 year-olds (Table 3).



**Figure 13.** Percentages of respondents identifying Marlboro (grey bar) or Camel (black bar) as the most frequently advertised cigarette brands (Pierce et al., 1991).

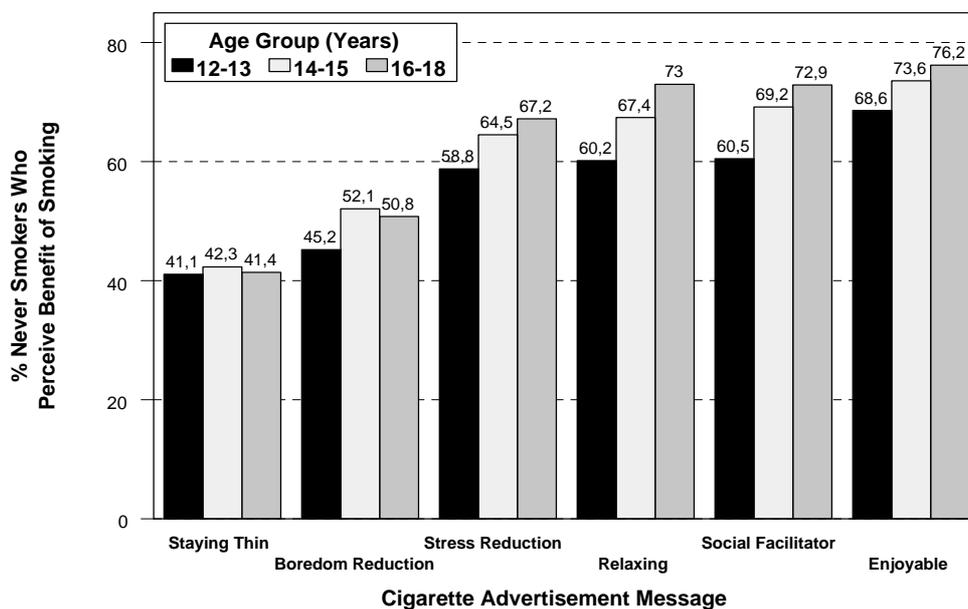
**Table 3.** Brand preferences of smokers in California (Pierce et al., 1991).

Age	Preferred brand (%)			N
	Marlboro	Camel	other	
<b>Males</b>				
12-17	55,4	24,5	18,0	131
18-24	71,3	12,7	16,0	567
25-29	61,7	13,8	24,5	470
30-44	47,7	10,5	41,8	1.579
≥45	21,1	8,1	70,8	1.316
<b>Females</b>				
12-17	63,3	21,7	13,4	102
18-24	69,4	5,5	25,1	461
25-29	49,5	3,6	46,9	467
30-44	33,0	2,3	67,7	1.500
≥45	12,7	2,2	85,1	1.594

The fact that central advertising messages are also noticed, cognitively evaluated and affectively processed by non-smoking adolescents was demonstrated by Evans, Farkas, Gilpin, Berry and Pierce (1995; see also Pierce, Choi, Gilpin, Farkas & Berry, 1998). In a telephone survey, they asked 3.536 never-smoking Californian adolescents aged between 12 and 17 whether cigarette advertising contained the following messages:

1. smoking is pleasant;
2. it helps you to relax;
3. it helps you to feel at ease in social situations;
4. it is an enjoyable leisure-time activity;
5. it helps you to stay thin;
6. it helps to reduce stress;
7. it helps to relieve boredom.

84% of the adolescents cited at least one of the seven advantages of smoking as propagated by the tobacco industry. The citation rate was above 60% for 4 of the messages (Figure 14).



**Figure 14.** *Never-smokers' perceptions of the advantages of smoking as propagated by advertising (Evans et al., 1995).*

## 7.2 Cognitions and attitudes

### Misestimations

Adolescents predisposed to smoking overestimate the prevalence and popularity of smoking among their peers and among adults, and underestimate the prevalence of negative attitudes about smoking and the risks of smoking among their peers (Bonnie & Lynch, 1994). They overestimate, therefore, the social benefits of smoking and underestimate the risks. Greening and Dollinger (1991), in this context, speak of an “invulnerability syndrome” among adolescents.

The ubiquity of cigarette advertising, with its images and its messages of the functions that smoking fulfils, contributes towards the adolescents' misestimations. Through this mechanism, advertising increases the likelihood of minors commencing smoking and/or remaining smokers (US Department of Health and Human Services, 1994).

The large-scale survey of German adolescents similarly showed that, in contrast to non-smokers, adolescents who were regular smokers overestimated the proportion of smokers in their own age-group. Estimations of the proportion of adults who smoke did not appear to correlate with the respondents' own smoking status. (Bergler et al., 1995).

### **Cognitive capabilities**

Adolescents are at a stage where they have not yet properly developed effective strategies for resisting attempts to persuade or convince. The same applies with regard to cognitive processes for weighing up advantages and disadvantages and, above all, for putting forward counter-arguments. They have fewer resources than adults for resisting advertising strategies and sales tactics. Consequently, they are less able to resist the attractions and enticements of advertising campaigns (Pollay, 1997).

### **7.3 Needs and motivations**

In order to be more effective, cigarette advertising plays on the particular psychological situation that adolescents find themselves in.

Adolescents are susceptible to images of romance, success, acceptance, popularity, adventure and independence. Advertising suggests that these things can be obtained by smoking cigarettes, thus helping adolescents to resolve their identity problems. What adolescents are seeking in adverts are symbols of adulthood.

Adolescents pay great attention to what is new and in vogue (Pollay, 1997). They are natural experimenters (Loudon & Della Bitta, 1993). Unsure of themselves, and needing to belong, they seek clues from their peers and from adverts as to how they should look and behave. They take an interest in cigarettes and other products that allow them to express their needs for experimentation, belonging, independence, responsibility and acceptance (Solomon, 1994). Cigarettes also serve as a means of defining and controlling social relationships (Stacey, 1982).

### **7.4 Self image**

If the image that adolescents have of themselves matches the characteristics of typical smokers as portrayed in the adverts, the probability of their smoking is increased. The same is true if the difference between self-image and ideal self-image is wide, i.e. if adolescents admire the characteristics of the smokers portrayed in adverts and/or want to acquire the same characteristics themselves (Burton et al., 1989; Chassin, Presson & Sherman, 1990; Chassin, Presson, Sherman, Corty & Olshavsky, 1981; Grube, Weir, Getzlaf & Rokeach, 1984).

The representative survey of 1 612 German adolescents (which is described in more detail further on) revealed no differences between smokers and non-smokers in their general patterns of evaluation of cigarette advertising (Bergler et al., 1995). Smoking and non-smoking adolescents differed in their self-image in only a few characteristics. Smokers portrayed themselves as less ambitious, less industrious, less sensible, less responsible and less health-conscious than non-smokers. In contrast to the above-mentioned studies, no evidence was found of self-image and ideal image being influenced by advertising, such as

adolescents internalising the images portrayed in adverts. There was no difference between smokers and non-smokers in terms of their ideal image. This isolated finding needs replicating in Germany, since the findings in the international literature are predominantly the opposite.

## **7.5 Social interaction within the peer group**

The special role played by the peer group in reinforcing the influence of advertising is referred to by Eicke (1992). Opinion leaders within the group who are influenced by the advertising messages will in turn cause the other members to be more strongly influenced by the adverts. Overall, therefore, the effect exerted by advertising depends on the evaluation of the message by the group. Petermann (1996) refers to the two-stage flow model for communications, when he states that the effect of the message is determined not by the message alone but by the social conveyance of the message within the group.

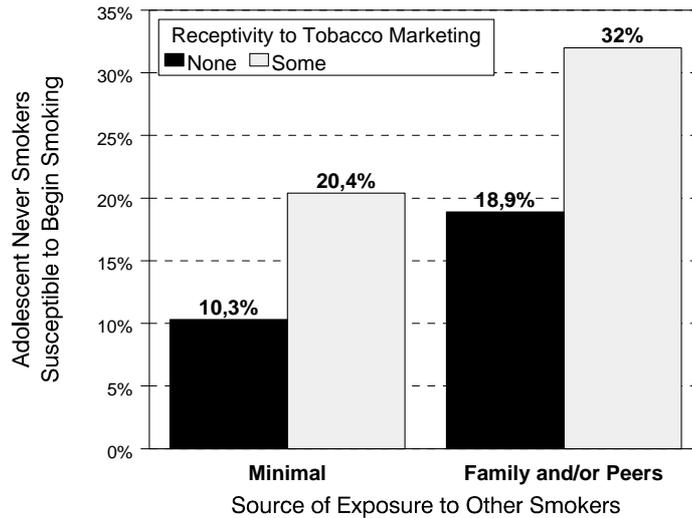
## **7.6 Receptivity to tobacco advertising and the experimentation phase**

In recent years there has been increasing research into the influence of direct and indirect advertising on the early stages of the smoking career, particularly on the transitions from preparation to experimentation to regular consumption.

A survey of 571 13-year-old Californian schoolchildren found that those who owned promotional items were 2.2 times more likely to experiment with smoking, and those who had at some time received mail from a cigarette company were 2.8 times more likely. These figures are adjusted to take account of social influences, e.g. from parents and peers (Schooler, Feighery & Flora, 1996).

Evans et al. (1995) investigated the extent to which tobacco advertising and exposure to smokers influenced smoking commencement by adolescents. Telephone interviews were conducted with 3 536 Californian non-smokers and then analysed. Susceptibility to cigarette advertising was measured by examining the responses to questions relating to, for example, ownership of (or desire to own) sales promotion articles, recall of advertising messages, favourite adverts and favourite brands. The extent of adolescent exposure to a smoking environment was classified in an index, in which account was taken of smoking by family members or best friends. Adolescents were rated susceptible to taking up smoking if they could not state unequivocally that they would never try a single cigarette, for example if they were offered one by their best friend.

One of the study's main findings was that adolescents who counted smokers among their family and among their peer group were twice as likely themselves to start smoking as other adolescents. Their susceptibility to starting smoking was also increased by a factor of two to four in correlation with their receptivity to advertising. Influence from their environment and receptivity to advertising were shown to be factors which, independently and in combination, can predict whether adolescents are susceptible to starting smoking (Figure 15).



**Figure 15.** *Susceptibility to starting smoking, based on receptivity to advertising and influence from the surrounding environment (Evans et al., 1995).*

In a further study featuring the same questions and methods, Altman, Douglas, Levine, Coeytaux, Slade and Jaffe (1996) conducted a representative telephone survey of 1 047 12-17 year-old adolescents in the USA. The authors were able to demonstrate that, statistically, awareness of and participation in a promotion campaign were significant predictors of susceptibility to trying cigarettes. Susceptibility to starting smoking was rated on the basis of points awarded depending on whether the adolescent wanted to try a cigarette soon, whether he would accept a cigarette offered by his best friend, whether he had already tried smoking and would do so again in the coming year, and whether he had smoked in the preceding month. The likelihood of experimenting with tobacco was doubled if the adolescent had noticed the advertising campaign, was 3.4 times higher if in addition a young friend owned promotional articles, was 9.3 times higher if in addition the adolescent had actively participated in the campaign, e.g. through himself becoming an owner of promotional articles and/or catalogues and coupons, and was 21.8 times higher if, in addition to all the aforementioned factors, the adolescent had received free trial packets. All of these figures are by reference to controls who did not have these cited characteristics.

Unger, Johnson and Rohrbach (1995) chose a different methodological approach. They divided 386 13-16 year-old Californian schoolchildren into three groups according to their susceptibility to smoking: non-susceptible non-smokers, i.e. those with no recognisable intention of trying cigarettes within the next two months (53.8% of the sample); susceptible non-smokers, i.e. those in which the intention could not be excluded (11.4%); and smokers, i.e. those who had smoked at least one cigarette in their life (34.9%). The schoolchildren were asked to judge six or eight cigarette advertisements. The results showed that the susceptible non-smokers liked the advertisements better than the non-susceptible non-smokers. The susceptible non-smokers and the smokers had similar views on the advertisements. According to the authors, these results back up the hypothesis that cigarette advertising encourages susceptible adolescents to experiment with smoking.

On balance, it can be said that the studies clearly show that minors can be reached through advertising. The results also substantiate the assumption that, as involvement in an advertising campaign increases, susceptibility to experiment with smoking also increases significantly.

To improve the evidence, however, these cross-sectional studies need to be augmented by prospective longitudinal studies.

## 7.7 Smoking initiation

In the scientific research, smoking initiation is taken to be the time at which a person has begun to smoke regularly, i.e. after the experimentation phase is over. However, according to Eicke (1996) the tobacco lobby avoids attaching a precise definition to this concept, thus making it more difficult to say what influence advertising has on smoking initiation.

Delener (1995) asked 1 462 11-14 year-old schoolchildren in New York State their reasons for starting smoking. The second most commonly mentioned reason (18.6%) was the influence of cigarette advertising. The most commonly mentioned reason (32.2%) was the social influence of parents, friends and idols who smoke.

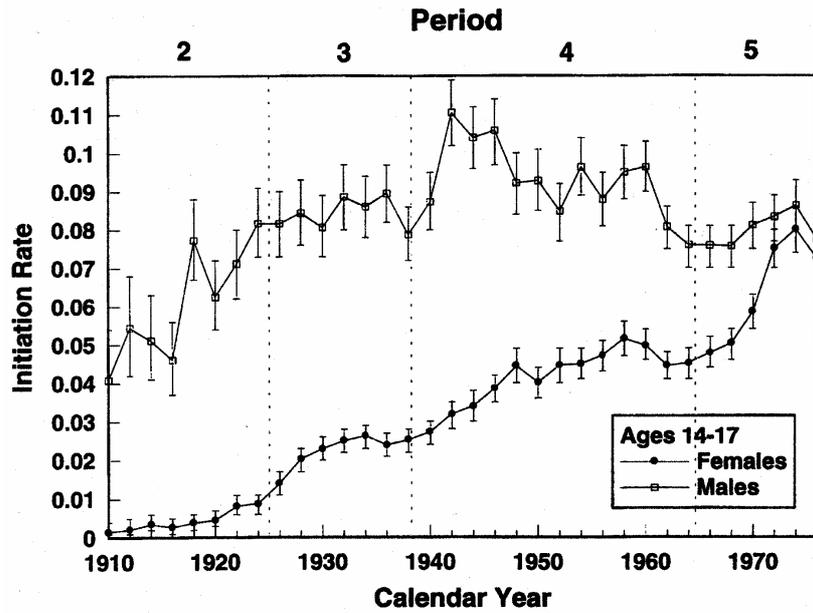
Over the last few years, the team led by John P. Pierce from the University of California, San Diego, has conducted a whole series of investigations into advertising-influenced smoking initiation. The gauge used, the initiation rate per calendar year, was calculated as the quotient of the sum of the weights for beginners in relation to the sum of the weights for persons at risk. This type of calculation ensures an adequate representation of the US population with regard to age, sex and race.

Pierce and Gilpin (1995) showed, in a historical analysis of four periods of time between 1910 and 1977, that after each of three major advertising campaigns the smoking initiation rate rose among 14-17 year-olds. The effect was gender-specific, i.e. the increase occurred only in the particular sex targeted by the advertising. The data on smoking behaviour are based on the 1955 Current Population Survey and on various of the National Health Interview Surveys conducted between 1970 and 1988, involving a total of 165 876 Americans.

The following periods were analysed:

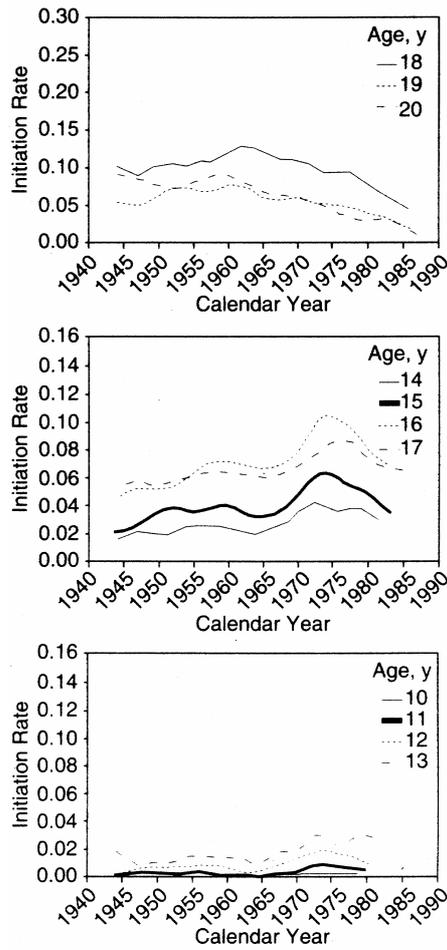
1. Pre-1910: target group: males. No specific campaign.
2. 1910-1925: target group: males. Introduction of Camel, "Camels are coming" (R.J. Reynolds Tobacco Company).
3. 1926-1939: target group: females. Chesterfield cigarettes "Blow some my way" and Lucky Strike cigarettes "Reach for a Lucky instead of a sweet" (American Tobacco Company). The latter campaign targeted women's fears of putting on weight through eating sweets.
4. 1940-1967: no focus on a particular target group.
5. 1968-1977: target group: females. Between 1967 and 1970 four new brands were introduced specifically for women. The most successful brand was Virginia Slims (Philip Morris Company), "You've come a long way baby". This campaign latched onto the theme of women's liberation.

Figure 16 illustrates in graphic form the initiation rate as a function of the calendar year or the specific advertising campaign.



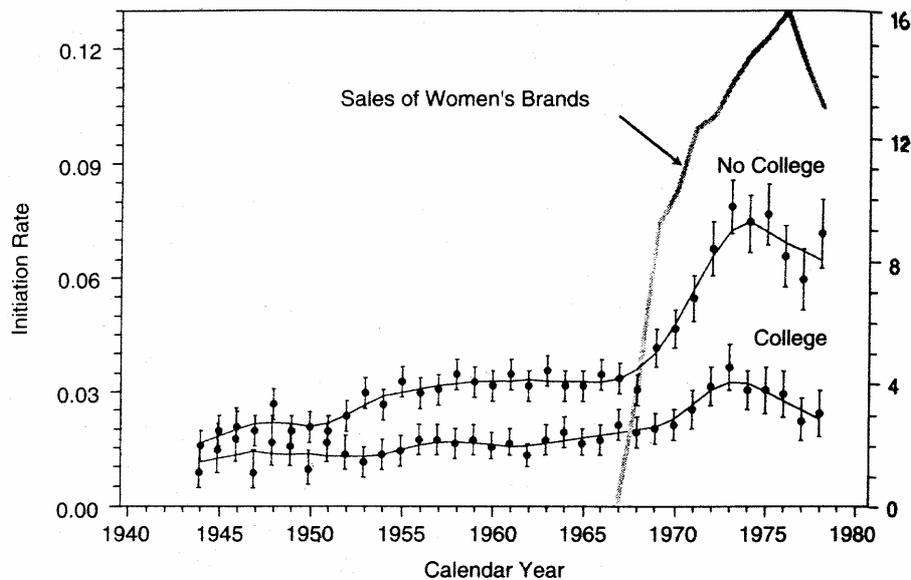
**Figure 16.** *Initiation rate among 14-17 year-old adolescents, as a function of the calendar year (Pierce & Gilpin, 1995).*

From a detailed analysis of the initiation rate among female adolescents from 1967 to 1973 (Period 5: Target group: females), Pierce, Lee and Gilpin (1994) were able to show that the percentage increase, depending on age, was between 33% and 110% (Figure 17). The most marked increase was among the 14-17 year-olds.



**Figure 17.** *Initiation rate among females, as a function of the calendar year (Pierce et al., 1994).*

At the peaks, the initiation rates for female adolescents were as high as those for young women of 18 and over and for males in the 14-20 age-group. However, the initiation rate for boys aged under 16 scarcely changed over the same time period. Among the 10-17 year-olds, the increase among girls not in college was particularly drastic compared with that among girls in college (120% compared with 70%) (Figure 18).



**Figure 18.** *Initiation rate of 10-17 year-old girls, as a function of the calendar year and education. The right ordinate indicates the turnover in billion US \$ for the Virginia Slims, Silva Thins and Eve brands (Pierce et al., 1994).*

In 1988 R.J. Reynolds launched a new multimedia advertising campaign for the Camel brand. Until then the focus had been on themes such as "Camel. Where a man belongs.". Now, however, Camel was presented with a new, gentle image, with the introduction of the Camel cartoon character "Old Joe". Pierce et al. (1991) compared the market shares obtained by Camel and Marlboro in 1990 with those obtained in the entire USA in 1986 for various age-groups. Marlboro served as a good comparison brand, since its image had not been altered during this five-year period.

Among 18-29 year-old males, the rise in market share for Camel was 230%, compared with 40% for Marlboro. Among women in this same age group the rise was even more dramatic: 450% for Camel, compared with 50% for Marlboro. The figures show that not only had there been a shift in the market shares, but that the total turnover of both brands rose and that Camel, in the wake of its advertising campaign, won a new market share out of all proportion.

The renowned scientific review "Science" commissioned a critical analysis of the abovementioned Pierce studies (Nowak, 1995):

**1. Evans et al. (1995).**

Malcolm Maclure of the Harvard School of Public Health agrees with the conclusions of the Pierce group insofar as he sees receptivity to advertising as a main factor in causing adolescents to smoke.

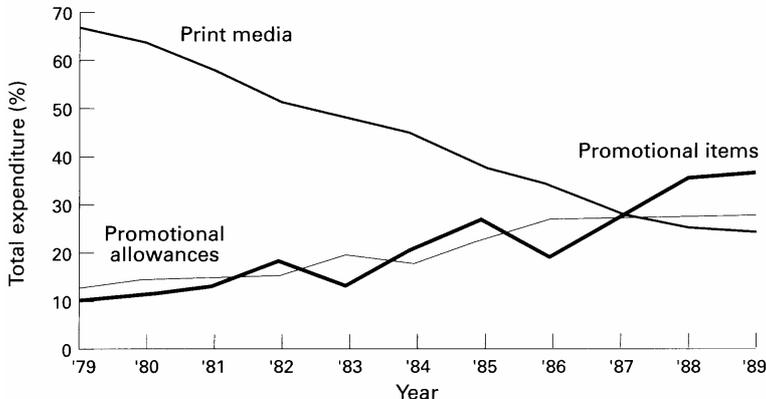
**2. Pierce and Gilpin (1995).**

Maclure judged that while the results were not absolutely conclusive, they did indicate that advertising caused adolescents to start smoking. The interpretation of the data was convincing enough to justify the introduction of public health measures.

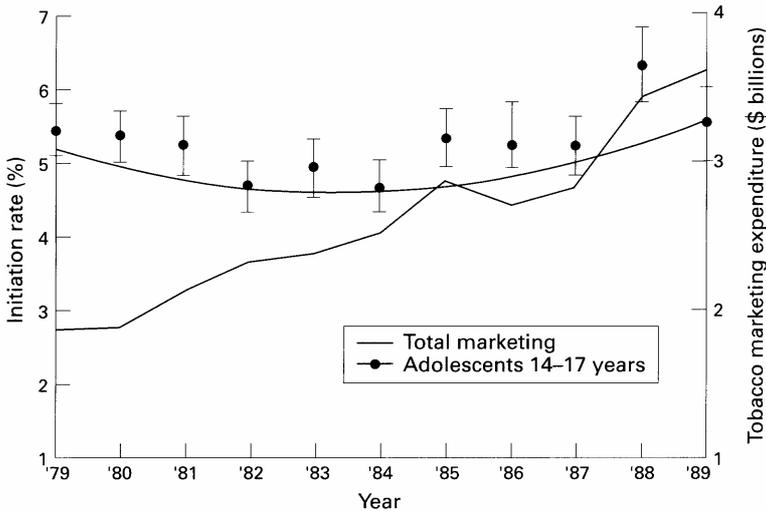
In a recently published study, Gilpin and Pierce (1997) investigated the smoking initiation rates among American 14-17 year-olds over the decade 1979-1989. They compared these rates with the tobacco industry's advertising expenditure. The analysis is based on data for 140 975 persons. Between 1979 and 1984 the initiation rate dropped by 15%, only to rise

again by 20% by 1989. During the decade in question, not only did the total advertising budget rise but the advertising strategy changed. While advertising in the print media fell from 2/3 of the total expenditure in 1979 to 25% in 1989, expenditure on promotional items and gifts, e.g. vouchers, rose from 10.2% in 1979 to 36.3% in 1989. Similarly, expenditure on promotional allowances for dealers rose from 12.7% in 1979 to 27.6% in 1989. Total advertising expenditure rose by 35.2% between 1979 and 1984.

The rate of increase accelerated in the second half of the decade, with an increase of 44.6% between 1984 and 1989 (Figure 19). There is a conspicuous chronological connection between the steep increase in advertising expenditure in the second half of the decade and the simultaneous increase in the smoking initiation rate (Figure 20). The initiation rate increased even though the price of cigarettes rose relative to inflation during that period.



**Figure 19.** Percentage of annual expenditure on the various forms of promotion (Gilpin & Pierce, 1997)



**Figure 20.** Initiation rate among 14-17 year-old (left y-axis). Total tobacco marketing expenditure in relation to the rate of inflation (Gilpin & Pierce, 1997).

In a longitudinal study concerning the correlation between awareness of cigarette advertising and onset of smoking, While, Kelly, Huang and Charlton (1996) surveyed 1 450 English schoolchildren aged 11 to 12. The children were asked to complete a questionnaire, and the

exercise was repeated one year later. Girls who named the brands that were being most heavily advertised at the time of the first survey were significantly more likely to have started smoking by the time of the second survey a year later than were girls who named other brands. The results for boys were numerically in the same direction, although they were not statistically significant.

The largest German survey to date concerning the correlation between various influencing factors and the smoking behaviour of adolescents was conducted by Bergler et al. (1995). The main study involved a demographically representative sample of 1 612 adolescents in the 12-18 age range. Of these, 615 were non-smokers, 453 occasional smokers and 444 smokers. The survey was conducted by the Allensbacher Institut für Demoskopie.

In a preliminary study, 160 adolescents were questioned in order to identify characteristics influencing the onset of smoking and smoking behaviour. The most important characteristics were incorporated into a questionnaire, the suitability of which was then tested out in a second preliminary study involving 79 respondents.

Using LISREL, data from the main study were tested to check whether they fitted well with a pre-established structure of latent factors. The variables measured serve as indicators for the latent factors. The model is depicted in Figure 21.

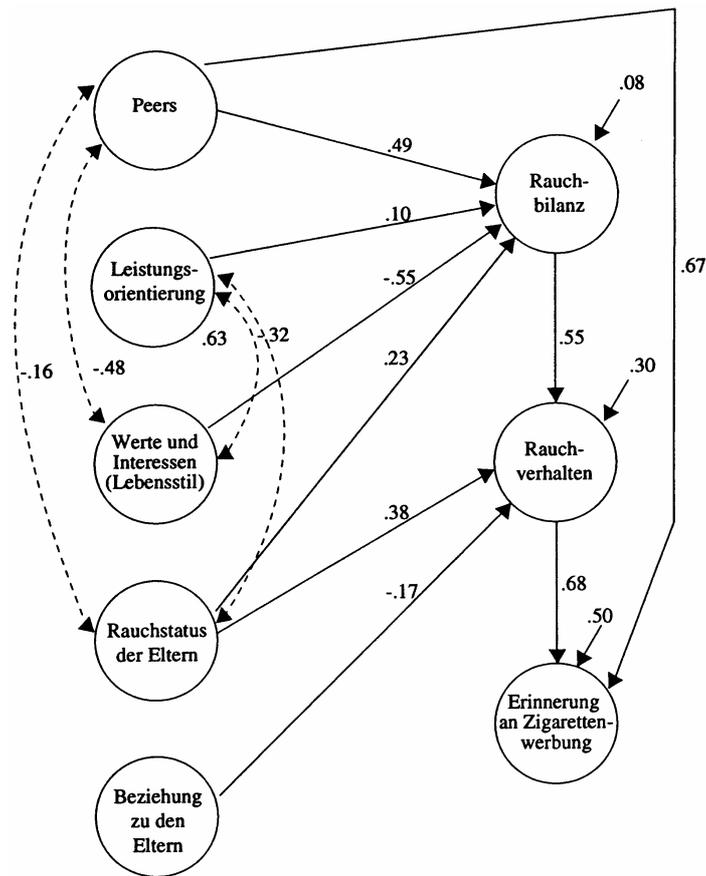
The Bergler et al. (1995) study identified three factors as good predictors of the smoking behaviour of adolescents, defined by the number of cigarettes smoked per day:

- smoking balance,
- smoking behaviour of parents,
- quality of the parents-child relationship.

The smoking balance is calculated through a weighted cost-benefit analysis. The main factors on the benefit side included: relaxation, stress reduction, concentration, diversion, avoidance of boredom, enjoyment, contact facilitation, greater self-confidence and self-assurance, feeling grown-up, acceptance by peers. Important factors on the cost side were: health risk, expense, danger of addiction, nuisance to others.

A positive smoking balance increased the probability of starting to smoke or continuing to smoke. The smoking balance could be predicted well via the following four factors: lifestyle, peers, achievement-mindedness and parental smoking behaviour. Together, these four factors accounted for 92% of the “smoking balance” variance.

Those who registered a positive smoking balance tended to have lifestyles characterised by particular values, interests and attitudes (rejection of traditional values such as success, good health, satisfaction, thrift; a positive attitude towards certain adult behaviours such as smoking and drinking, not showing weakness, looking like an adult, seeking fun, adventure, independence; leisure-time activities involving bars and discos and watching action films and sex films; greater dissatisfaction with present living conditions).



**Figure 21.** Structural model of the smoking behaviour of adolescents, with standardised weights and errors (Bergler et al., 1995).

Key to <b>Figure 21</b>	
Original text	Translation
Leistungsorientierung	Achievement-mindedness
Werte und Interessen (Lebensstil)	Values and interests (lifestyle)
Rauchstatus der Eltern	Parental smoking status
Beziehung zu den Eltern	Relationship with parents
Rauchbilanz	Smoking balance
Rauchverhalten	Smoking behaviour
Erinnerung an Zigarettenwerbung	Recall of cigarette advertising

Those with a positive smoking balance had a firm link to peer groups in which they could find excitement and stability and in which smoking and drinking were normal and encouraged. These behaviours also dictated the adolescent's self-image. Generally, the subject's steady girlfriend or boyfriend also smoked. These subjects also had negative views of their own capabilities, as well as of school and teachers. They were often in conflict with teachers.

Adolescents with parents who also smoked and drank tended to have a positive smoking balance. The parents' consumption behaviour was, however, in its own right, a good direct predictor of the adolescent's smoking behaviour.

The quality of the relationship between parents and child was also a good predictor of the adolescent's smoking behaviour. Two factors contributed to the quality of the relationship: treating the adolescent as a child and conflict, as well as a lack of openness in the partnership between parents and child. Frequent arguments with parents, but also between parents, along with a lack of affection and an unwillingness to discuss problems correlated with higher adolescent cigarette consumption.

The advertising factor, based on ability to recall cigarette advertisements, was also included in the model to be tested. Smoking behaviour was shown to be a good predictor for recall of advertisements. Nevertheless, it accounted for only 50% of the variance in the "recall of advertising" factor. LISREL cannot be used to demonstrate any evidence of a causal relationship between the two factors. Bergler et al. (1995) maintain, however, that causal effect correlations can be demonstrated with LISREL: "With the help of LISREL it is now possible, however, even in a cross-sectional analysis, to test the assumption that the correlation between the observed variables derives from certain causalities; ..." (Bergler et al., 1995, p. 376).

LISREL, however, is a so-called structural equation model. It is based on lineal equations, in which weighted contributions can be linked together additively. This procedure cannot produce evidence of causal relationships (Andres, 1992; Rietz, Rudinger & Andres, 1996). A LISREL-based interpretation is comparable with that of a complex multiple prediction, which is similarly unsuitable for producing causal conclusions.

Only systematically induced or naturally occurring variations in conditions permit proof to be established of cause-effect relationships. Additionally, the approach adopted in this study was a cross-sectional analysis. Only longitudinal investigations could possibly provide evidence of possible causal correlations.

It is to be assumed that these same criticisms would also have been raised in a "peer-review process" in a reputable specialist journal. However, this study was published as a book by a small publishing house. It is presumed that its contents have not been subjected to more extensive evaluation by independent experts. Accordingly, the status of this publication within the scientific specialist community must be classified as low.

To summarise, the most recent studies cited would seem to provide sufficient evidence that cigarette advertising helps to increase the smoking initiation rate among adolescents. Advertising therefore promotes the transition from experimentation to regular, habitual smoking. Eicke (1996) calls this process "habitualisation".

## **7.8 Econometric studies of the relationship between advertising expenditure and tobacco consumption**

Econometric studies often measure the "elasticity coefficient". In the context of advertising, this describes the percentage change in total consumption following a 10% increase in advertising. Thus, for example, a coefficient of .15 signifies a 15% increase in consumption.

Meta-analyses reveal a positive elasticity for cigarette advertising (Andrews & Franke, 1991; Laugesen & Meads, 1991a,b; Toxic Substances Board, 1989; US Department of Health and Human Services, 1989).

Andrews and Franke (1991) looked at 23 worldwide studies conducted between the years 1950 and 1990. Their estimations are based on elasticities averaged and weighted per study. The mean elasticity was .085. The elasticity decreased over the years. This can be explained by the fact that the share of the total promotion budget actually spent on advertising fell over the same period.

Reuijl (1982) and Leeflang and Reuijl (1985) investigated the market in the Federal Republic of Germany between 1960 and 1975, finding only positive elasticities ranging from .04 to .18.

In the only study to date on the connection between the extent of brand-specific cigarette advertising and the effects on the market shares of individual brands among adolescents, compared with adults, Pollay et al. (1996), using standard market analysis techniques, found that there is a significant correlation between cigarette advertising and brand choice among adolescents. This correlation is significantly stronger for adolescents than for adults. The elasticity coefficient was .28 for adults and .94 for adolescents: in other words, adolescents are three times more susceptible to advertising than adults. In this connection, the adolescents do not simply ape the brand choices of adults, they actually react independently of adults. On the one hand, the largest proportions of adolescents choose the most heavily advertised brands, and on the other hand, the buying behaviour of adolescents reacts more strongly to changes in advertising intensity. Both the extent and the dynamic of buying behaviour, therefore, reflect the higher susceptibility of adolescents.

The analysis was based on US data on market shares among adolescents and adults from five years between 1979 and 1993, as well as time series of advertising expenditure on nine brands between 1974 and 1993. The data regarding the adolescents were taken from five studies involving a total of 1 500 respondents aged between 12 and 18 years.

These findings therefore confirm the 1992 and 1994 observations of the Center for Disease Control and Prevention (Center for Disease Control and Prevention, 1992, 1994; Elders, Perry, Erikson, & Giovino, 1994; US Department of Health and Human Services, 1994), namely that the brands most frequently consumed by adolescents are those that are advertised the most. One of the most recent examples is the "Old Joe Camel" campaign, which led to a significant increase in sales of Camel to the under-18s (DiFranza et al., 1991). The findings are also in concordance with the historical analysis of the cigarette market from 1910 to 1977, conducted by Pierce and Gilpin (1995). The authors demonstrated that the major advertising campaigns coincided chronologically with high smoking initiation rates among adolescents.

## **8. Effect of advertising bans**

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The 1993 GESOMED/BIPS report discussed in detail the meta-analyses and general surveys published until then concerning the effects of advertising bans on tobacco consumption. These included the studies by Boddewyn (1986, 1989), Laugesen and Meads (1991a), the Toxic Substances Board (1989) and the UK Department of Health (1992). In recent years there have been no further major reviews of data from many countries. This applies equally to Luik's 1994 review.

However, new publications have appeared concerning individual countries. Presented below are epidemiological data from four countries that have introduced advertising bans, namely Norway, Finland, New Zealand and France. A further country, Canada, had also introduced advertising bans, but these have been suspended for the present, following a ruling by the Supreme Court of Canada. Italy too has had an advertising ban on tobacco products since 1962, but despite intensive enquiries to the WHO and the Italian Health Ministry no adequate comparison data were made available, so we are unable to include Italy in the following comparison of countries.

It should be borne in mind that advertising bans always form part of a broader package of measures to reduce the number of smokers or tobacco consumption. The longitudinal examination of smoker prevalence rates in the abovementioned four countries is compared with the available prevalence rates for Germany, to permit conclusions to be drawn on the effectiveness of a package of measures that also includes advertising bans.

The packages of measures go far beyond voluntary self-regulating agreements on the part of the tobacco industry, which have been investigated and found wanting by, among others, Daube (1993) and Mindell (1993). The measures include, among other things, statutory limit values for harmful substances in tobacco, price rises, bans on the sale of tobacco products to minors, health education campaigns, prevention programmes for children and adolescents, the establishment of no-smoking zones, the tightening up of other laws (e.g. on product liability), and the use of a certain proportion of the duty raised on tobacco for research and health education.

In the following analysis, it should be borne in mind that there has been a legal ban on the advertising of tobacco products on radio and television in Germany since 1974. However, the packages of measures and the advertising bans introduced by the four abovementioned countries are substantially more extensive than those in Germany. This justifies the comparison of these countries with Germany.

### **8.1 Norway**

Since 1 July 1975 all forms of advertising for tobacco products and smoking accessories have been banned in Norway, with a few small exceptions (e.g. since 1989 for imported print media). The ban applies to all media. There is also a ban on advertising tobacco products in connection with other goods.

Country-wide surveys by the National Council on Smoking and Health have shown that the prevalence rate (percentage of daily smokers) among 13-15 year-olds reached its maximum in 1975, then fell sharply until 1980, particularly among girls, and continued to fall between

1980 and 1990, albeit less markedly and less consistently. Depending on age-group and sex, the decline over the total period was between 5 and 10%. The prevalence rate among young adults between ages 16 and 24 has fallen steadily since 1973, by a total of 10% for women and 20% for men (Bjartveit, 1990; Rimpelä, Aarø & Rimpelä, 1993).

Kraft and Svendsen (1997) described the trend in prevalence rates from 1973 to 1995 for various age-groups, based on the National Council on Smoking and Health data. The rate dropped significantly among 16-74 year-old men, from 52% in 1973 to 36% in 1990. Thereafter it remained relatively stable, standing at 35% in 1995. Among women in the same age-range, the prevalence rates changed only minimally between 1973 and 1995. In 1995 the rate stood at 32%.

The prevalence rate (percentage of daily smokers) among adolescent girls in the 16-19 age-range fell from 39% in 1973 to 21% in 1985. It then rose slightly until 1988, thereafter falling slightly, to stand at 20.8% in 1995. In 1996 the rate was 22.3% (Norwegian Council on Tobacco and Health, cited by Joossens, 1997). The percentage of daily smokers among females in the 20-24 age-group was 46% in 1973, reducing to 34% by 1987. This figure then rose to 37% by 1989, and by 1995 had fallen to 30%.

The prevalence rate among 16-19 year-old males was 37% in 1973, falling to 18% by 1989, after which it began to rise annually, reaching 24.7% in 1994. According to the Norwegian Council on Tobacco and Health (cited by Joossens, 1997) the rate in 1996 was 22.2%. For 20-24 year-old males, the rate was 52% in 1973, falling to 33% by 1989, and standing at 34% in 1995.

The average per capita consumption of tobacco products declined relatively continuously after the introduction of the advertising ban in 1975, from 2 100 g in 1975 to 1 553 g in 1996 (Norwegian Council on Tobacco and Health, cited by Joossens, 1997).

## **8.2 Finland**

A tobacco prevention law entered into force in Finland in 1977, and was tightened up still further by an amended law in 1994. Among other things, the first law prohibited all forms of tobacco advertising with effect from 1978, while the second also prohibited all forms of tobacco promotion, i.e. indirect forms of advertising (Puska, Korhonen, Uutela & Piha, currently being printed). The first law did not apply to foreign magazines, which have a wide circulation in Finland.

Since 1978 the health behaviour of the population has been surveyed each year by the National Public Health Institute. Every spring, 5 000 persons aged between 15 and 64 receive a questionnaire in the post.

The prevalence rate (percentage of daily smokers) for men stood at 46% in 1975, falling to 33% by 1990 and 27% by 1996. The corresponding rate for women stood at 23% in 1975, falling to 20% in 1990 and 18% in 1996. Data by age-group have only been available since 1978/79. At that point in time, 35% of males and 25% of females in the 16-25 age-group smoked. By 1990, the prevalence rate had fallen to 29% for men and 24% for women, by 1996 it stood at 23% for both sexes, and in 1997 it stood at 23% for men and 21% for women (National Public Health Institute, cited by Joossens, 1997; Piha, 1995; Puska et al., currently being printed). The reduction has therefore been more marked among males.

Following the introduction of the first law tobacco consumption fell by 6.7%, to approximately 2 000 g per capita, after which it remained relatively stable during the 1980s. It then fell again sharply after the introduction of the amended law, to 1 881 g in 1994. Between 1990 and 1994 tobacco consumption fell by 15%, and by 1996 it stood at 1 350 g (Pekurinen, 1991; Puska et al., 1997; Statistics Finland, 1995, cited by Joossens, 1997).

### **8.3 New Zealand**

A ban on advertising came into force in New Zealand at the end of 1990. Average per capita tobacco consumption stood at 1 957 g in 1990, falling steadily to 1 553 g by 1996. The prevalence rate among 15-19 year-olds was 26.8% in 1990, falling to 24.7% by the end of 1995 (Statistics New Zealand and Health New Zealand, cited by Joossens, 1997).

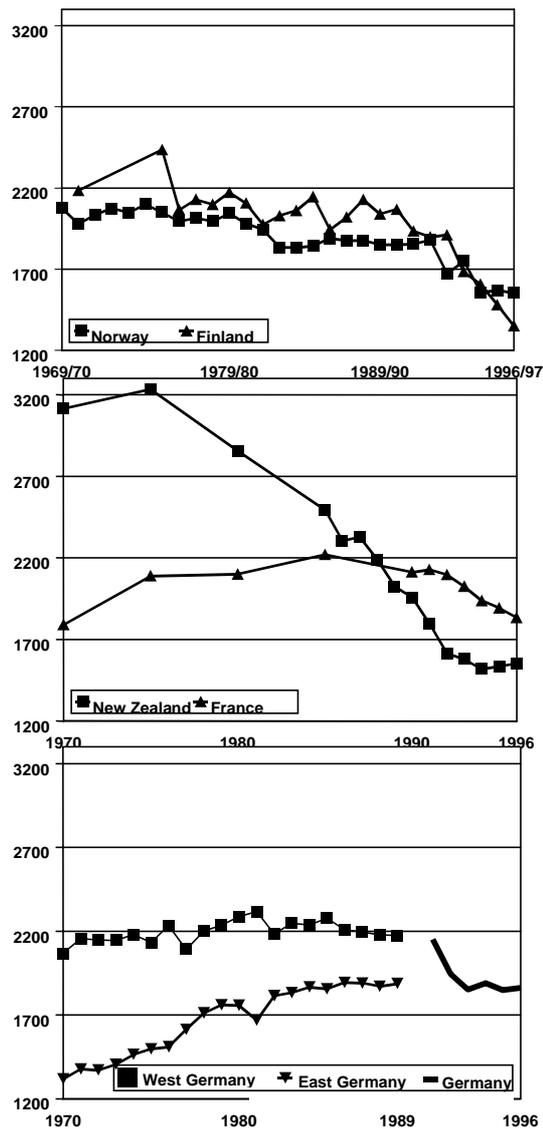
### **8.4 France**

An advertising ban came into effect in France in January 1993. The average per capita consumption of cigarettes fell from 2 097 g in 1992 to 1 834 g in 1996. Over the same period, the prevalence rate among 12-18 year-olds remained stable, at 34% (Centre de Documentation et d'Information sur le Tabac and Comité Français pour l'Éducation à la Santé, cited by Joossens, 1997).

### **8.5 Germany in comparison with Norway, Finland, New Zealand and France**

The per capita tobacco consumption figures reported by Joossens (1997) can be compared with the corresponding German statistics. The German figures are based on the Tabakwarenstatistik (tobacco products statistics) (Junge, 1997). Figure 22 shows how the four countries that have introduced advertising bans compare with Germany.

In making the comparison it must also be borne in mind that German re-unification reunited the German Democratic Republic (East Germany), which was an "advertisement-free" country, with the Federal Republic (West Germany), which had virtually no restrictions on tobacco advertising. Compared with West Germany, per capita tobacco consumption in East Germany was lower. If we were to look only at the figures for West Germany from 1975 to 1989, we would actually observe a 2% increase in per capita consumption. The reduction in average consumption in the 1990s is therefore due at least in part to the merger of West and East Germany. Since the tobacco products statistics do not contain breakdowns according to new and old Federal Länder, we have to look at the total data set. This calculation gives a more positive picture of the development of average tobacco consumption in Germany than might actually be expected. This applies in particular to the comparison with Norway and Finland, since the reference years used for the comparisons with these two countries are, respectively, 1975 and 1977, i.e. the data used are for the "old" Federal Republic, which are then compared with data for the re-united Germany (1996). It is to be assumed that the reduction in average consumption calculated for Germany would be even lower in comparison with Norway and Finland if it were possible to work out the trend for the "old" Federal Länder alone.



**Figure 22.** Per capita consumption of (in grammes) in five countries.

capita tobacco products

Table 4 shows the differences in per capita consumption in the individual countries from the introduction of the ban on advertising until 1996. It can be seen that all the countries that have introduced an advertising ban have experienced significantly greater reductions in tobacco consumption than has Germany. Norway's reduction in per capita consumption is twice as great as Germany's, Finland's and France's reductions are more than three times as great as Germany's, and New Zealand's reduction is 50% greater than Germany's.

**Table 4.** Per capita consumption of tobacco products (cigarettes, rolling tobacco and pipe tobacco), in grammes. (In France, cigarettes only).

Country	Introduction of advertising ban	Reference year for the evaluation	Reduction in consumption up to 1996	Reduction in consumption in Germany up to 1996
Norway	1.7.1975	1974/1975	- 26%	- 13%
Finland	1.3.1978	1977	- 37%	- 11%
New Zealand	17.12.1990	1990; for D: '89/'91*	- 21%	- 14%/ - 13%
France	1.1.1993	1992	- 14%	- 4%

\* No data available for united Germany ("D") for the year 1990.

The "Verband der Zigarettenindustrie" (cigarette industry association) analyses the effect of advertising bans in relation the figures for cigarette production in each country. Table 5 compares national cigarette production at the time of introduction of the legal measures with production in 1996, for ten countries.

**Table 5.** Advertising bans and cigarette production, according to the figures of the cigarette industry association (Verband der Zigarettenindustrie (vdc), 1998).

Country	Advertising ban since:	Cigarette production (in millions)	
			1996
	<b>Total ban</b>		
France	1993	1993: 93.600	86.200
Italy	1962	1963: 58.580	89.400
New Zealand	1962 and 1990	1963: 3.756	6.300
Norway	1973	1976: 746	1.320
Portugal	1983	1983: 14.329	13.900
	<b>Limited ban</b>		
Denmark	1991	1991: 11.407	12.500
Ireland	1979	1979: 7.858	7.900
Canada	1989, 1995, 1997	1990: 46.111	58.000
Spain	1995	1995: 76.490	77.260
USA	1969	1969: 557.647	890.107

One criticism concerning the above data is that it is not possible to infer the actual per capita consumption of the population purely on the basis of the national cigarette production figures, since on the one hand a proportion of the cigarettes produced are exported and on the other hand there is no account taken of imported products. Even a single group normally has production plants in several EU Member States, so cross-border flows of goods are inevitable.

Another way of analysing the effects of advertising bans is to examine the smoking prevalence rates of adolescents in the countries in question. Here, however, it should be noted that the smoking status was defined differently in Germany than in the other four countries:

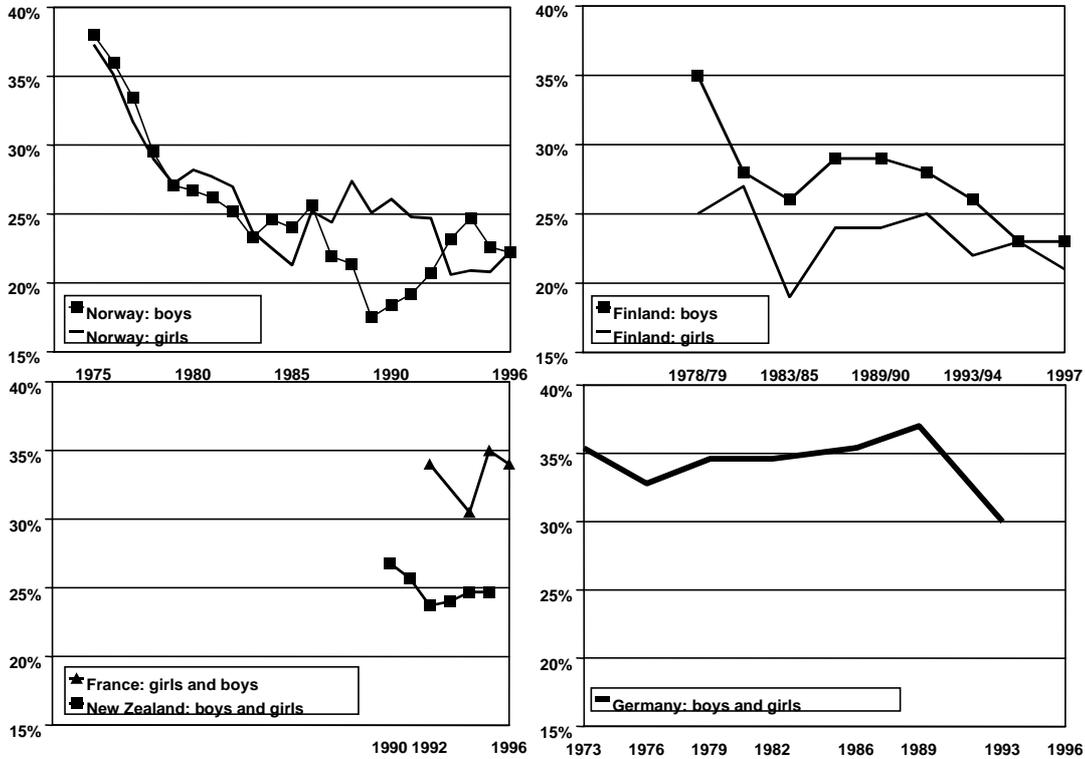
- in Norway, Finland, New Zealand and France the data collected related to "daily smoking",
- in Germany the data collected related to "regular" smoking.

The German data come from the “drug affinity study” conducted by the BZgA (Federal Centre for Health Education). A further problem is that data are available only up to 1993 for Germany, but up to 1996 for the other countries.

Additionally, the age-ranges differed slightly:

- Norway: 16-19 year-olds,
- Finland: 16-25 year-olds,
- New Zealand: 15-19 year-olds,
- France: 12-18 year-olds,
- Germany: 14-25 year-olds (only the old Federal Länder).

The main results of this comparison are shown in Figure 23 and in Table 6.



**Figure 23.** Smoking prevalence rates among adolescents ( “daily smokers” in Norway, Finland, New Zealand and France; “regular smokers” in Germany).

**Table 6.** *Percentage of adolescents smoking daily (in Germany: percentage of adolescents smoking regularly).*

Country	Introduction of advertising ban	Reference year for the evaluation	Reduction in consumption up to 1996; in Germany up to 1993
Norway	1.7.1975	1975	- 15,8% boys; - 15,4% girls
Finland	1.3.1978	1978/79	- 12% boys; -14% girls
New Zealand	17.12.1990	1990	- 2,1%
France	1.1.1993	1992	0%
Germany	-	1973	- 5,4%

It can be seen that, compared with Germany, Norway and Finland have achieved significantly greater reductions in the percentage of adolescents who smoke, while the reductions in France and New Zealand are nil or very small.

### Summary:

The data for the four countries that have introduced extensive advertising bans and additional health policy measures demonstrate that per capita consumption of tobacco products can be reduced by banning advertising. Although per capita consumption fell in Germany too over the comparable period, the reduction was much less than in Norway, Finland, New Zealand and France. With the exception of France, this applies also to the absolute values: average per capita tobacco consumption is around or below 1 500 g in Norway, Finland and New Zealand, compared with over 1 800 g in Germany and France.

With slight qualifications, relating particularly to methodological problems in comparing the smoker rates (different definitions of smoker status, different comparison periods, different age-ranges), this conclusion can be applied also to the group most in need of protection, adolescents. Countries such as Norway and Finland, which introduced advertising bans many years ago, have achieved a significant reduction in smoking prevalence, while New Zealand and France, which introduced advertising bans only recently, have achieved only a small reduction, if any.

The conclusion that can be drawn, in line with Esser and Maschewski-Schneider (1994), is that the advertising ban on tobacco products in those countries which have implemented the ban politically has paid off over the long term.

## 8.6 Possible effects of an advertising ban in Germany – Effects on the advertising industry and acceptance of the ban by the public

Table 7 presents a breakdown of advertising expenditure in Germany, according to the Zentralverband der deutschen Werbewirtschaft (Central Association of the German Advertising Industry). In 1996, advertising expenditure on cigarettes and spin-off products was DM 151 million. Although a nine-figure sum, this is relatively small compared with the spend in other sectors, such as the automobile industry, the mass media, and even alcohol (beer and spirits). A percentage comparison also illustrates this point: the amount spent advertising tobacco was only 5.9% of the amount spent advertising the automobile market, and the tobacco sector was not even among the 25 sectors with the highest advertising

budgets. The effects on the advertising industry of a tobacco advertising ban in Germany are therefore likely to be small.

**Table 7.** Advertising expenditure in 1996 in Germany, according to data from the Zentralverband der deutschen Werbewirtschaft (1997) and Junge (1997).

Sector	Gross media investments (in DM millions)
1. Automobile market	2.559
2. Mass media	2.223
3. Trading organisations	1.650
4. Pharmaceuticals for the public	1.092
5. Chocolate and sweets	1.041
6. Banks and savings institutions	856
7. Computer hardware/software and services	849
8. Beer	771
9. Mail-order companies	661
10. Office machines and equipment	463
11. Coffee, tea, cocoa	462
12. Detergents	454
13. Dairy products	441
14. Insurance	440
15. Corporations	439
16. Non-alcoholic drinks	420
17. Hair products	397
18. Cleaning materials	363
19. Furnishings	343
20. Perfumes and scents	339
21. Outer clothing	325
22. Cosmetic products	321
23. Tinned foods, meat, fish	317
24. Spirits	304
25. Tour operators	279
Cigarettes, including spin-off products (e.g. Camel Boots, Stuyvesant Travel, etc.)	151

The acceptance by the public of an advertising ban in Germany is likely to be high. Within the framework of the Federal survey into the use and abuse of illegal drugs, alcoholic drinks, medicinal drugs and tobacco products, a representative survey was conducted into the acceptance of preventive measures for reducing tobacco consumption (Herbst, Kraus & Scherer, 1996).

Of the 7 833 adults in the age-range 18-59 questioned in the first half of 1995, 60.3% supported a general advertising ban on tobacco products. The rate of acceptance correlates with smoker status: the rate was 66.7% among non-smokers, 69.2% among ex-smokers, and 47.2% among smokers.

## **1. Brief comments on the questions considered in this report**

Before we look directly at the individual questions considered in the report, a few basic comments are called for regarding the possibility of analysing scientifically the correlation between advertising and tobacco consumption.

It is not possible to extract conclusive causal evidence from this complex web of interactions between the diverse factors that influence smoking behaviour. It is impossible in practical terms, and irresponsible in ethical terms, to conduct research with randomised groups, in which one group is exposed to cigarette advertising and the other is not (Strasburger, 1995; US Department of Health and Human Services, 1994). Equally, it is impossible to keep constant the other influencing parameters, such as the risk factors associated with smoking, in order to assess the effects of advertising. Additionally, we have to take account of the many and varied interactions between the economic, social, somatic and psychological factors involved.

For all these reasons, it is impossible to produce conclusive, absolutely incontrovertible proof.

The strategy we opted for in this report was to accumulate indirect evidence, drawing on the results of studies based on very different methodological approaches. The studies described include:

- traditional research into the effects of advertising (perception, recall, attitudes, etc.),
- historical analyses of advertising campaigns,
- econometric studies,
- epidemiological longitudinal studies,
- intervention studies into the effects of an advertising ban.

The findings all point in the same direction: cigarette advertising strongly influences the smoking behaviour of young people (Pollay et al., 1996). The indirect evidence is so strong that the introduction of health policy measures can be satisfactorily justified (Eicke, 1996; Glantz et al., 1996; Nowak, 1995; Rimpelä et al., 1993). This view is also held by a series of highly respected scientists from various scientific organisations (American College of Chest Physicians, American Thoracic Society, Asia Pacific Society of Respiriology, Canadian Thoracic Society, European Respiratory Society, International Union Against Tuberculosis and Lung Disease, 1995; High-Level Committee of Cancer Experts, 1996), as well as five Nobel Prize winners for medicine (Alliance Française Pour La Santé; Coalition Contre Le Tabagisme, 1997).

The individual questions considered in the report can be answered as follows:

**1. Can it be demonstrated that tobacco advertising influences children and adolescents in their attitudes towards smoking and their smoking behaviour?**

It has been well demonstrated empirically that even young children are aware of cigarette advertising and have a good recall of adverts. They are more familiar with certain characters in advertisements than adults. The images used in advertising exert a much stronger effect on adolescents than on adults, since adolescents, who are still in the identity-formation phase, react very sensitively to symbols of adulthood. Several studies demonstrate a positive correlation between the ability of adolescents to recall a particular advert or trademark and intention to smoke, commencement of smoking or extent of smoking.

Also significant is the fact that adolescents possess less well-developed cognitive capabilities and coping strategies than adults for resisting advertising ploys.

From the psychological perspective, cognitive and emotional processes are the main processes that help to explain how advertising influences the consumption behaviour of adolescents. Advertising endeavours, via cognitive processes, to persuade the potential consumer of the benefit of the product, whether this benefit be in terms of satisfying particular needs or of attaining an ideal self-image. The emotional reaction to a product goes back in part to conditioning processes, which are channelled through positive affective reactions to the advertising. Modern psychological theories such as the theory of “planned behaviour” explain the intention to act as the result of attitudes related to the action and of normative convictions. It has been shown repeatedly that advertising influences subjective/social norms among adolescents. Norms contribute significantly to the image of the smoker. Further normative influences are conveyed via peer-group pressure, e.g. pressure to emulate the behaviour of models portrayed in advertising.

It can be shown that advertising influences social norms by contributing towards a situation where smoking is regarded as desirable in society and in the peer group. Social-cognitive learning theory claims that the behaviour of models is closely imitated when such behaviour visibly produces a desired effect. Advertising messages, such as the image of independence, suggest to the consumer that he can gain independence through smoking and not solely through his own endeavours. This has the result of weakening the consumer’s own self-effectiveness and strengthening a desired self-image. It has been shown time and again that the probability of smoking commencement increases whenever there is a discrepancy between the current and the ideal self-image.

**2. Does tobacco advertising have an influence on total tobacco consumption and on smoker rates (prevalence, or smoking commencement), or only on the establishment of brand preferences? Does advertising help to increase/maintain total consumption levels, and do bans or restrictions on advertising help to reduce total consumption?**

Empirical studies indicate not only that advertising reaches young people but also that the more that young people actively participate in advertising campaigns, the much more likely they are to experiment with smoking. The American researcher John P. Pierce has shown that after major advertising campaigns there is an increase in the proportion of young people taking up smoking and becoming regular smokers.

Econometric studies provide further evidence of the link between advertising and tobacco consumption. In an extensive meta-analysis, Pollay et al. demonstrated that an increase in the advertising budget for individual brands led to increased consumption of these brands by both adolescents and adults, albeit to different degrees: adolescents responded three times more strongly than adults to changes in advertising expenditure.

There is no empirical support for the tobacco industry’s claim that the purpose of advertising is merely to persuade smokers to switch brands. Rather, the aim is to create high brand loyalty among consumers.

**3. Can national and international studies demonstrate a link between advertising bans/restrictions and smoking prevalence, and on what additional factors do the trends depend? Or do they demonstrate that there is no such influence?**

As part of a package of health policy measures to reduce the number of smokers and the amounts of tobacco smoked, some countries have introduced bans on the advertising of tobacco products. In some cases these have been in force for more than 20 years. Epidemiological data demonstrate that the introduction of an advertising ban and other additional policy measures leads to a reduction in tobacco consumption and prevalence rates. A longitudinal examination of average per capita tobacco consumption in Norway, Finland, New Zealand and France from the introduction of these countries' advertising bans until 1996, in comparison with the figures for Germany over the same period, shows a substantially greater reduction of consumption in all these countries compared with Germany. Norway's reduction in per capita consumption is twice as great as Germany's, Finland's and France's reductions are more than three times as great, while New Zealand's reduction is 50% greater.

**4. Compared with other factors (parents, peer group, etc.), how important, qualitatively and quantitatively, is the (socio-)psychological influence of advertising in motivating children and adolescents to start smoking and become regular smokers?**

A whole range of risk factors for predicting the development of adolescents into regular smokers have been investigated. Table 8 lists the risk factors investigated and rates their influence, based on the results of the studies described in Chapter 4. The ratings shown relate only to the influence of each of the factors in isolation. It is likely that, when combined together, the effects of the individual risk factors are not merely additive but supra-additive.

Advertising and promotion can also be regarded as risk factors for regular smoking in adolescence.

The classification of the influence of the individual factors is based on plausibility considerations after an analysis of the literature, and needs further empirical investigation.

**Table 8.** Variables (Risk factors) which increase the probability of regular tobacco consumption in adolescence.

<b>Factors</b>	<b>Influence</b>
<b>Personal characteristics</b>	
Age (critical period of adolescence)	++
Genetic make-up and personality factors	+ -
Awareness of the health consequences	0
Positive attitude towards smoking	+
Low sense of personal worth	+ -
Intentions to smoke	++
Previous experimentation and early initiation	++
Poor school performance	++
<b>Social factors</b>	
Low socio-economic status	++
Parents and siblings who smoke	+ -
Peers who smoke, and peer-group endorsement of smoking	++
Troubled social relationships at home/school	+
<b>Environmental factors</b>	
Easy availability	+
Cheapness in relation to money available	+
Advertising and promotion	+
<b>Relation to other health-relevant behaviours</b>	
Alcohol consumption	++
Consumption of illegal drugs	++

- ++ strongly increased probability of smoking
- + increased probability of smoking
- + - inconsistent data
- 0 no effect

## Bibliography

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- Aarø, L.E., Hauknes, A. & Berglund, E.-L. (1981). Smoking among Norwegian schoolchildren 1975-1980. II. The influence of social environment. *Scandinavian Journal of Psychology*, 22, 297-309.
- Adams, G.R., Montemayor, R. & Gullotta, T.P. (Eds.) (1996). *Psychosocial development during adolescence. Progress in developmental contextualism*. Thousands Oaks, CA: Sage.
- Aitken, P. P., Eadie, D. R., Hastings, G. B. & Haywood, A. J. (1991). Predisposing effects of cigarette advertising on children's intentions to smoke when older. *British Journal of Addiction*, 86, 383-390.
- Aitken, P. P., Leathar, D. S., O'Hagan, F. & Squire, S. I (1987). Children's awareness of cigarette advertisements and brand imagery. *British Journal of Addiction*, 82, 615-622.
- Ajzen, I. & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 11-39). Seattle: Hogrefe & Huber.
- Ajzen, I. (1988). *Attitudes, personality, and behavior*. Homewood, IL: Dorsey Press.
- Altman, D.G., Levine, D.W., Coeytaux, R., Slade, J. & Jaffe, R. (1996). Tobacco promotion and susceptibility to tobacco use among adolescents aged 12 through 17 years in a nationally representative sample. *American Journal of Public Health*, 86, 1590-1593.
- American College of Chest Physicians, American Thoracic Society, Asia Pacific Society of Respiriology, Canadian Thoracic Society, European Respiratory Society, International Union Against Tuberculosis and Lung Disease. (1995). Smoking and health: A Physician's responsibility. A statement of the joint committee on smoking and health. *European Respiratory Journal*, 8, 1808-1811.
- Amos, A., Jacobson, B. & White, P. (1991). Cigarette advertising and coverage of smoking and health in British women's magazines. *Lancet*, 337, 93-96.
- Andres, J. (1992). Einführung in LISREL. In L. Hildebrandt, G. Rudinger & P. Schmidt (Eds.), *Kausalanalysen in der Umweltforschung: Beiträge eines Methodenworkshops am Wissenschaftszentrum Berlin* (pp. 16-50). Stuttgart: Fischer.
- Andrews, R. L. & Franke, G. R. (1991). The determinants of cigarette consumption: A meta-analysis. *Journal of Public Policy & Marketing*, 10, 81-100.
- Ary, D.V. & Biglan, A. (1988). Longitudinal changes in adolescent cigarette smoking behavior: Onset and cessation. *Journal of Behavioral Medicine*, 11, 641-647.
- Ashton, H. & Stepney, R. (1982). *Smoking: Psychology and Pharmacology*. London: Tavistock.
- Ausschuß hochrangiger Krebs Sachverständiger (High-Level Committee of Cancer Experts) (1996). *Empfehlungen zu Tobacco*. Helsinki.
- Baacke, D., Sander, U. & Vollbrecht, R. (1993). *Children and Advertising. Schriftenreihe des Bundesministeriums für Frauen und Jugend, Band 12*. Stuttgart: Kohlhammer.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122-147.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1992). Exercise of personal agency through the self-efficacy mechanism. In R. Schwarzer (Ed.), *Self-efficacy: Thought control of action* (pp. 3-38). Washington: Hemisphere Publishing Corporation.
- Bangert-Drowns, R.L. (1988). The effects of school-based substance abuse education: A meta-analysis. *Journal of Drug Education*, 18, 243-264.

- Bardo, M.T. & Mueller, C.W. (1991). Sensation seeking and drug abuse prevention from a biological perspective. In L. Donohew, H.E. Sypher & W.J. Bukoski (Eds.), *Persuasive communication and drug abuse prevention* (pp. 195-207). Hillsdale, NJ: Lawrence Erlbaum.
- Bartecchi, C.E., MacKencie, T.D. & Schrier, R.W. (1995). The global epidemic. *Scientific American*, May issue, 26-33.
- Bauman, K.E. & Ennett, S.T. (1996). On the importance of peer influence for adolescent drug use: Commonly neglected considerations. *Addiction*, 91, 185-198.
- Bauman, K.E., Fisher, L.A., Bryan, E.S. & Chenoweth, R.L. (1994). Antecedents, subjective expected utility, and behavior: A panel study of adolescent cigarette smoking. *Addictive Behaviors*, 9, 121-136.
- Bayerisches Staatsministerium für Arbeit and Sozialordnung, Familie, Frauen and Gesundheit (1997). *Gesundheitsverhalten von Jugendlichen in Bayern: Ein Überblick über die repräsentativen Jugendgesundheitsstudien in Bayern von 1973 bis heute*. München.
- Bergler, R., Haase, D., Humburg, S., Steffens, M. & Noelle-Neumann, E. (1995). *Ursachen gesundheitlichen Fehlverhaltens im Jugendalter: Eine empirische Analyse am Beispiel des cigarettenskonsums: Einstieg and Gewohnheitsbildung*. Köln: Deutscher Institutsverlag.
- Bertrand, L.D. & Abernathy, T.J. (1993). Predicting cigarette smoking among adolescents using cross-sectional and longitudinal approaches. *Journal of School Health*, 63, 100-105.
- Biener, K. & Vogt, R. (1977). Der Einfluß der Eltern auf den Tobaccokonsum and das Sportverhalten ihrer Kinder. *Suchtgefahren*, 23, 75-79.
- Biglan, A., Henderson, J., Humphrey, D., Yasui, M., Whisman, R., Black, C. & James, L. (1995). Mobilising positive reinforcement to reduce youth access to tobacco. *Tobacco Control*, 4, 42-48.
- Birrell Weisen, R. (1997). Life skills education in schools. Vortrag gehalten auf dem Kongreß "The 7<sup>th</sup> European Conference on the Promotion of Mental Health". Maastricht, 8-10.10.1997.
- Bjartveit, K. (1990). Fifteen years of comprehensive legislation: Results and conclusions. *The global war. Proceedings of the seventh world conference on tobacco and health*, 71-80.
- Boddewyn, J. J. (1986). *Tobacco advertising bans and consumption in 16 countries*. New York: International Advertising Association.
- Boddewyn, J. J. (1989). There is no convincing evidence for a relationship between cigarette advertising and consumption. *British Journal of Addiction*, 84, 1255-1261.
- Bonnie, R.J. & Lynch, B.S. (1994). Time to up the ante in the war on smoking. *Issues in Science and Technology*, 11, 33-37.
- Boomsma, D.I., Koopmans, J.R., van Dooren L.J.P. & Orlebeke, J.F. (1994). Genetic and social influences on starting to smoke: A study of Dutch adolescent twins and their parents. *Addiction*, 89, 219-226.
- Borgers, D. (1988). Rauchen and Berufe. Rauchverhalten bei 125 ausgewählten Berufen. *Prävention*, 11, 12-15.
- Botvin, G.J. (1995). Drug abuse prevention in school settings. In G.J. Botvin, S. Schinke & M.A. Orlandi (Eds.), *Drug abuse prevention with multiethnic youth* (pp. 169-192). Thousands Oaks, CA: Sage.
- Botvin, G.J. (1996). Substance abuse prevention through life skills training. In R. DeV. Peters & R.J. McMahon (Eds.), *Preventing childhood disorders, substance abuse, and delinquency* (pp. 215-240). Thousands Oaks, CA: Sage.
- Botvin, G.J., Baker, E., Dusenbury, L., Botvin, E.M. & Diaz, T. (1995). Long-term follow-up results of a randomised drug abuse prevention trial in a white middle-class population. *Journal of the American Medical Association*, 273, 1106-1112.
- Botvin, G.J., Dusenbury, L., Baker, E., James-Ortiz, S., Botvin, E.M. & Kerner, J. (1992). Smoking prevention among urban minority youth: Assessing effects on outcome and mediating variables. *Health Psychology*, 11, 290-299.
- Botvin, G.J., Goldberg, C.J., Botvin, E.M. & Dusenbury, L. (1993). Smoking behavior of

- adolescents exposed to cigarette advertising. *Public Health Reports*, 108, 217-224.
- Brauner, K. (1980). Grundlagen, Ziele and Maßnahmen einer Erziehung zum nikotinfreien Leben bei Kindern and Jugendlichen. In Bundesvereinigung für Gesundheitserziehung e.V. (Publisher), *Rauchen and Gesundheit. Deine Wahl*, 81-93.
- Brengelmann, J.C., Reig, A. & Müller, G. (1984). Persönlichkeit, Streß and Rauchverhalten. *Suchtgefahren*, 30, 65-70.
- Britt, S.H. (1979). *Psychological principles of marketing and consumer behavior*. New York.
- Brook, J.S., Brook, D.W., Gordon, A.S., Whiteman, M. & Cohen, P. (1990). The psychosocial etiology of adolescent drug use: A family interactional approach. *Genetic, Social, and General Psychology Monographs*, 116 (2).
- Brook, J.S., Whiteman, M., Gordon, A.S. & Brook, D.W. (1988). The role of older brothers in younger brothers' drug use viewed in the context of parent and peer influences. *Journal of Genetic Psychology*, 151, 59-75.
- Bruvold, W.H. & Rundall, T.G. (1988). A meta-analysis and theoretical review of school based tobacco and alcohol intervention programs. *Psychology and Health*, 2, 53-78.
- Bruvold, W.H. (1993). A meta-analysis of adolescent smoking prevention programs. *American Journal of Public Health*, 83, 872-880.
- Bry, B.H., McKeon, P. & Pandina, R.J. (1982). Extent of drug use as a function of the numbers of risk factors. *Journal of Abnormal Psychology*, 91, 273-279.
- Bühringer, G. (1994). Aktuelle Konzepte zur Primärprävention des Substanzmißbrauchs mit Schwerpunkt "Schulische Prävention". In Deutsche Hauptstelle gegen die Suchtgefahren (Publisher), *Suchtprävention* (pp. 55-64). Freiburg im Breisgau: Lambertus.
- Bundeszentrale für gesundheitliche Aufklärung (BZgA) (1994). *Die Drogenaffinität Jugendlicher in der Bundesrepublik Germany. Wiederholungsbefragung 1993/1994*. Köln.
- Burow, F. & Hanewinkel, R. (1994). Nichtraucher ist "in". *Unterricht Biologie*, 18, 34-36.
- Burton, D., Sussman, S., Hansen, W. B., Johnson, C. A. & Flay, B. R. (1989). Image attributions and smoking intentions among seventh grade students. *Journal of Applied Social Psychology*, 19, 656-664.
- Carmelli, D. Swan, G.E., Robinette, D. & Fabsitz, R. (1992). Genetic influence on smoking – a study of male twins. *New England Journal of Medicine*, 327, 829-833.
- Carruthers, S. & McDonald, C. (1995). The availability of cigarettes to minors in Perth, Western Australia. *Tobacco Control*, 4, 49-52.
- Centers for Disease Control and Prevention (1992). Comparison of the cigarette brand preferences of adult and teenaged smokers: United States 1989 and 10 U.S. Communities, 1988 and 1990. *Morbidity and Mortality Weekly Report (MMWR)*, 41, 169-181.
- Centers for Disease Control and Prevention (1994). Changes in the cigarette brand preferences of adolescent smokers: United States, 1989-1993. *Morbidity and Mortality Weekly Report (MMWR)*, 43, 577-581.
- Chapman, S., Cohen, A., Nelson, B. & Woodward, S. (1993). A boycott of tobacco-sponsored cars? *Tobacco Control*, 2, 159.
- Charlton, A. & Blair, V. (1989). Absence from school related to children's and parental smoking habits. *British Medical Journal*, 298, 90-92.
- Charlton, A., While, D. & Kelley, S. (1997). Causes of absence from school related to children's and their parent's smoking. *Tobacco Control*, 6, 150-151.
- Chassin, L. & Presson, C.C. (1990). The natural history of cigarette smoking: Predicting young-adult smoking outcomes from adolescent smoking patterns. *Health Psychology*, 9, 701-716.
- Chassin, L., Presson, C. C., Sherman, S. J., Corty, E. & Olshavsky, W. (1981). Self-images and cigarette smoking in adolescence. *Personality and Social Psychology Bulletin*, 7, 670-676.
- Chassin, L., Presson, C.C. & Sherman, S.J. (1989). "Constructive" vs. "destructive" deviance in adolescent health related behaviors. *Journal of Youth and Adolescence*, 18, 245-262.
- Chassin, L., Presson, C.C. & Sherman, S.J. (1990). Social psychological contributions to the understanding and prevention of adolescent cigarette smoking. *Personality and Social Psychology Bulletin*, 16, 133-151.

- Chassin, L., Presson, C.C., Rose, J.S. & Sherman, S.J. (1996). The natural history of cigarette smoking from adolescence to adulthood: Demographic predictors of continuity and change. *Health Psychology, 15*, 478-484.
- Clayton, R.R. (1992). Transitions in drug use: Risk and protective factors. In M. Glantz & R. Pickens (Eds.), *Vulnerability to drug abuse* (pp. 15-51). Washington, DC: American Psychological Association.
- Cloninger, C.R. (1987). Neurogenetic adaptive mechanism in alcoholism. *Science, 236*, 412-420.
- Cloninger, C.R., Svarkic, D.M. & Przybeck, T.R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry, 50*, 975-990.
- Coeytaux, R.R., Altman, D.G. & Slade, J. (1995). Tobacco promotions in the hands of youth. *Tobacco Control, 4*, 253-257.
- Coie, J.D., Watt, N.F., West, S.G., Hawkins, J.D., Asarnow, J.R., Markman, H.J., Ramey, S.L., Shure, M.B. & Long, B. (1993). The science of prevention. A conceptual framework and some directions for a national research program. *American Psychologist, 48*, 1013-1022.
- Conrad, K.M., Flay, B.R. & Hill, D. (1992). Why children start smoking cigarettes: Predictors of onset. *British Journal of Addiction, 87*, 1711-1724.
- Daube, M. (1993). Voluntary agreements: Designed to fail. *Tobacco Control, 2*, 183-184.
- Delener, N. (1995). Assessing cigarette smoking motives of young adolescents in the US: Research and health perspectives. *The Journal of Smoking-Related Disorders, 6*, 81-88.
- DeVries, H., Dijkstra M. & Kuhlmann, P. (1988). Self-efficacy: The third factor besides attitude and subjective norm as a predictor of behavioural intentions. *Health Education Research, 3*, 273-282.
- DeVries, H., Kok, G. & Dijkstra, M. (1990). Self-efficacy as a determinant of the onset of smoking and interventions to prevent smoking in adolescents. *European Perspectives in Psychology, 2*, 209-222.
- Dielman, T.E. (1994). School-based research on the prevention of adolescent alcohol use and misuse: Methodological issues and advances. *Journal of Research on Adolescence, 4*, 271-293.
- DiFranza, J. R., Richards, J. W., Paulman, P. M., Wolf-Gillespie, N., Fletcher, C., Jaffe, R. D. & Murray, D. (1991). RJR Nabisco's cartoon camel promotes Camel cigarettes to children. *Journal of the American Medical Association, 266*, 3149-3153.
- Dolcini, M.M. & Adler, N.E. (1994). Perceived competencies, peer group affiliation, and risk behavior among early adolescents. *Health Psychology, 13*, 496-506.
- Donohew, L., Lorch, E. & Palmgree, P. (1991). Sensation seeking and targeting of televised anti-drug PSAs. In L. Donohew, H.E. Sypher & W.J. Bukoski (Eds.), *Persuasive communication and drug abuse prevention* (pp. 209-226). Hillsdale, NJ: Lawrence Erlbaum.
- Dryfoos, J.G. (1990). *Adolescents at risk: Prevalence and prevention*. New York: Oxford University Press.
- Dryfoos, J.G. (1991). Adolescents at risk: A summation of work in the field - programs and policies. *Journal of Adolescent Health, 12*, 630-637.
- Durlak, J.A. (1995). *School-based prevention programs for children and adolescents. Developmental Clinical Psychology and Psychiatry. Vol. 34*. Thousands Oaks, CA: Sage.
- Eicke, U. (1992). *Stellungnahme aus werblich-wissenschaftlicher Sicht zum Abschlußbericht der Pilotstudie "Auswirkungen der Tobaccoadvertising and der cigarettesautomaten auf das Konsumverhalten, insbesondere von Kindern and Jugendlichen"*. Bonn.
- Eicke, U. (1996). Probleme eines Werbeverbots für Tabakwaren. *Therapiewoche, 16*, 866-873.
- Elders, M.J., Perry, C.L., Erikson, M.P. & Giovino, G.A. (1994). The report of the Surgeon General: Preventing tobacco use among young people. *American Journal of Public Health, 84*, 543-547.
- Ellickson, P.L. & Bell, R.M. (1990). Drug prevention in junior high: A multi-site longitudinal test. *Science, 247*, 1299-1305.

- Esser, A. & Maschewsky-Schneider, U. (1994). Verführt Tobaccoreklame Kinder and Jugendliche zum Rauchen? *Jahrbuch Sucht '95* (pp. 52-61). Neuland: Geesthacht.
- European Commission (1995). *Eurobarometer 1995. Opinions on cancer prevention*. Luxembourg.
- Evans, N., Farkas, A., Gilpin, E., Berry, C. & Pierce, J. P. (1995). Influence of tobacco marketing and exposure to smokers on adolescent susceptibility to smoking. *Journal of the National Cancer Institute*, 87, 1538-1545.
- Eysenck, H.J. (1965). *Smoking, health and personality*. London: Weidenfeld & Nicolon.
- Fischer, P. M., Schwartz, M. P., Richards, J. W., Goldstein, A. O. & Rojas, T. H. (1991). Brand logo recognition by children aged 3 to 6 years. *Journal of the American Medical Association*, 266, 3145-3148.
- Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Flay, B.R. (1985). Psychosocial approaches to smoking prevention: A review of findings. *Health Psychology*, 4, 449-488.
- Flay, B.R. (1993). Youth tobacco use: Risks, patterns, and control. In C.T. Orleans & J. Slade (Eds.), *Nicotine addiction: Principles and management* (pp. 365-384). New York: Oxford University Press.
- Flint, A.J. & Novotny, T.E. (1997). Poverty status and cigarette smoking prevalence and cessation in the United States, 1983-1993: The independent risk of being poor. *Tobacco Control*, 6, 14-18.
- Florsheim, P., Tolan, P.H. & Gorman-Smith, D. (1996). Family processes and risk for externalizing behavior problems among African American and Hispanic boys. *Journal of Consulting and Clinical Psychology*, 64, 1222-1230.
- Fuchs, R. & Schwarzer, R. (1997). Tobaccokonsum: Erklärungsmodelle and Interventionsansätze. In R. Schwarzer (Publisher), *Gesundheitspsychologie. Ein Lehrbuch* (2. Aufl.; pp. 209-244). Göttingen: Hogrefe.
- Gambescia, S.F. (1995). Adolescent use of cigarette vending machines. *Tobacco Control*, 4, 295.
- Gesellschaft für sozialwissenschaftliche Forschung in der Medizin (GESOMED)/Bremer Institut für Präventionsforschung and Sozialmedizin (BIPS) (1993). *Auswirkungen der Tobaccoadvertising and der cigarettesautomaten auf das Konsumverhalten, insbesondere von Kindern and Jugendlichen: Ergebnisse einer Literaturstudie. Gutachten im Auftrag des Bundesministers für Gesundheit*. Bonn.
- Gilpin, E.A. & Pierce, J.P. (1997). Trends in adolescent smoking initiation in the United States: Is tobacco marketing an influence? *Tobacco Control*, 6, 122-127.
- Glantz, S.A., Slade, J., Bero, L.A., Hanauer, P. & Barnes, D. E. (1996). *The cigarettes papers*. Berkeley: University of California Press.
- Glantz, S.A. & Parmley, W.W. (1995). Passive smoking and heart disease: Mechanism and risk. *Journal of the American Medical Association*, 273, 1047-1053.
- Glynn, T.J. (1989). Essential elements of school-based smoking prevention programs. *Journal of School Health*, 59, 181-188.
- Goebel, K. (1994). Lesbian and gays face tobacco targeting. *Tobacco Control*, 3, 65-67.
- Goldstein, A.O., Fischer, P.M., Richards, J.W. & Creten, D. (1987). Relationship between highschool student smoking and recognition of cigarette advertisements. *Journal of Pediatrics*, 110, 488-491.
- Greening, L. & Dollinger, S.J. (1991). Adolescent smoking and perceived vulnerability of smoking related causes of death. *Journal of Pediatric Psychology*, 16, 687-699.
- Grube, J. W., Weir, I. L., Getzlaf, S. & Rokeach, M. (1984). Own value system, value images, and cigarette smoking. *Personality and Social Psychology Bulletin*, 10, 306-313.
- Hanewinkel, R. (1997). *Psychologische Prävention: Grundlagen, Programme, Methoden and Ergebnisse der psychologischen Prävention exemplifiziert an der Verhütung des Rauchens*. Kiel: Institut für Therapie- and Gesundheitsforschung.

- Hanewinkel, R., Burow, F. & Ferstl, R. (1996). Verhaltenstherapeutische Prävention and Therapie des Rauchens am Beispiel einer Interventionsstudie in Schulen. In H.S. Reinecker & D. Schmelzer (Publisher), *Verhaltenstherapie, Selbstregulation, Selbstmanagement* (pp. 417-433). Göttingen: Hogrefe.
- Hanewinkel, R., Burow, F., Böttcher, M., Petermann, U. & Ferstl, R. (1993). Training sozialer Kompetenzen in der Schule im Rahmen der Kampagne "Rauchfreie Schule" - Ein erster Erfahrungsbericht. *Kindheit and Entwicklung. Zeitschrift für Klinische Kinderpsychologie*, 2, 256-259.
- Hanewinkel, R., Ferstl, R. & Burow, F. (1993). Merkmale von Situationen, in denen Jugendliche rauchen. *Sucht*, 39, 232-235.
- Hanewinkel, R., Ferstl, R. & Burow, F. (1994). Konzeption and Evaluation einer verhaltensorientierten Nichtraucherförderung an Schulen. *Verhaltenstherapie*, 4, 104-110.
- Hanewinkel, R., Ferstl, R. & Burow, F. (1995). Interventionsstudie zur Primär- and Sekundärprävention des Rauchens an Schulen. In K. Mann & G. Buchkremer (Publisher), *Suchtforschung and Suchttherapie in Germany. Sucht. Sonderband 1995*, 34-37.
- Hanewinkel, R., Petermann, U., Burow, F., Dunkel, A. & Ferstl, R. (1994). Förderung der Lebenskompetenzen von Kindern and Jugendlichen im Rahmen der Kampagne "Rauchfreie Schule". *Kindheit and Entwicklung. Zeitschrift für Klinische Kinderpsychologie*, 3, 112-116.
- Hansen, W.B. (1992). School-based substance abuse prevention: A review of the state of the art in curriculum, 1980-1990. *Health Education Research*, 7, 403-430.
- Hansen, W.B., Graham, J.W., Sobel, J.L., Shelton, D.R., Flay, B.R. & Johnson, C.A. (1987). The consistency of peer and parent influences on tobacco, alcohol, and marijuana use among young adolescents. *Journal of Behavioral Medicine*, 10, 559-579.
- Hawkins, J.D., Catalano, R.F. & Miller, J.Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, 112, 64-105.
- Heath, A.C. & Madden, P.A.F. (1995). Genetic influences on smoking behavior. In J.R. Turner, L.R. Cardon & J.K. Hewitt (Eds.), *Behavior genetic approaches to behavioral medicine* (pp. 45-66): New York: Plenum Press.
- Herbst, K., Kraus, L. & Scherer, K. (1996). *Repräsentativerhebung 1995. Schriftliche Befragung zum Gebrauch psychoaktiver Substanzen bei Erwachsenen in Germany*. Bonn: Bundesministerium für Gesundheit.
- Hess, H. (1989). Tobacco. In S. Scheerer & I. Vogt (Publisher), *Drogen and Drogenpolitik* (S. 125-158). Frankfurt: Campus.
- Hirschman, E.C. (1995). One woman's view of Pollay's paper on " 'below the belt' cigarette advertising". *Tobacco Control*, 4, 192-193.
- Holak, S. L. & Tang, Y. E. (1990). Advertising's effect on the product evolutionary cycle. *Journal of Marketing*, 50, 16-29.
- Hops, H., Tildesley, E., Lichtenstein, E., Ary, D. & Sherman, L. (1990). Parent-adolescent problem-solving interactions and drug use. *American Journal of Drug and Alcohol Abuse*, 16, 239-258.
- Hu, T.W., Keeler, T.E., Sung, H. & Barnett, P.G. (1995). The impact of California anti-smoking legislation on cigarette sales, consumption, and prices. *Tobacco Control*, 4 (suppl 1), S34-S38.
- Hu, T.W., Sung, H. & Keeler, T.E. (1995). Reducing cigarette consumption in California: Tobacco taxes vs. an anti-smoking media campaign. *American Journal of Public Health*, 85, 1218-1222.
- Hundley, J.D. & Mercer, G.W. (1987). Family and friends as social environments and their relationship to young adolescents' use of alcohol, tobacco, and marijuana. *Journal of Clinical Psychology*, 44, 125-134.
- Institute of Medicine (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research*. Washington, DC: National Academy Press.

- Jemmott, J.B., Ditto, P.H. & Croyle, R.T. (1986). Judging health status: Effects of perceived prevalence and personal relevance. *Journal of Personality and Social Psychology*, 50, 899-905.
- Jessor, R. & Jessor, S.L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*. San Diego, CA: Academic Press.
- Jessor, R. (1976). Predicting time of onset of marijuana use: A developmental study of high school youth. *Journal of Consulting and Clinical Psychology*, 44, 125-134.
- Jessor, R. (1993). Successful adolescent development among youth in high-risk-settings. *American Psychologist*, 48, 117-126.
- Jessor, R. (1997). Protective factors in adolescent health behavior. Paper given at the "14<sup>th</sup> International Symposium Health Behaviour in Adolescence: Theoretical Concepts and Evaluation of Prevention Programs". Bielefeld, 26.-27.9.1997.
- Jonas, K. & Doll, J. (1996). Eine kritische Bewertung der Theorie überlegten Handelns and der Theorie geplanten Verhaltens. *Zeitschrift für Sozialpsychologie*, 27, 18-31.
- Joossens, L. (1997). *The effectiveness of banning advertising for tobacco products*. Brüssel: Union Internationale contre le Cancer.
- Junge, B. (1996). Tobacco - Zahlen and Fakten zum Konsum. In Deutsche Hauptstelle gegen die Suchtgefahren (Publisher), *Jahrbuch Sucht '97* (pp. 19-29). Geesthacht: Neuland.
- Junge, B. (1997). Tobacco - Zahlen and Fakten zum Konsum. In Deutsche Hauptstelle gegen die Suchtgefahren (Publisher), *Jahrbuch Sucht '98* (pp. 19-42). Geesthacht: Neuland.
- Kandel, D.B. & Logan, J.A. (1984). Patterns of drug use from adolescence to young adulthood I. Periods of risk for initiation, continued use and discontinuation. *American Journal of Public Health*, 74, 660-666.
- Kandel, D.B., Kessler, R.C. & Margulies, R.S. (1978). Antecedents of adolescent initiation into stages of drug use: A developmental analysis. *Journal of Youth and Adolescence*, 7, 13-40.
- Kelder, S.H., Perry, C.L., Klepp, K.I. & Lytle, L.L. (1994). Longitudinal tracking of adolescent smoking, physical activity, and food choice behaviors. *American Journal of Public Health*, 84, 1121-1126.
- Kelly, D.H. & Balch, R.W. (1971). Social origins and school failure: A reexamination of Cohen's theory of working-class delinquency. *Pacific Social Review*, 14, 413-430.
- King, A., Wold, B., Tudor-Smith, C. & Harel, Y. (1996). *The health of youth: A cross-national survey*. Copenhagen: World Health Organization.
- King, C., Siegel, M., Celebucki, C. & Conolly, G.N. (1998). Adolescent exposure to cigarette advertising in magazines. *Journal of the American Medical Association*, 279, 516-520.
- Kok, G., Boer, D.J., DeVries, H., Gerads, F., Hospers, H.J. & Mudde, A.N. (1992). Self-efficacy and attribution theory in health education. In R. Schwarzer (Ed.), *Self-efficacy: Thought control of action* (pp. 245-262). Washington: Hemisphere Publishing Corporation.
- Kok, G., DeVries, H., Mudde, A.N. & Strecher, V.J. (1992). Planned health education and the role of self-efficacy: Dutch research. *Health Education Research*, 6, 231-238.
- Kraft, P. & Svendsen, T. (1997). Tobacco use among young adults in Norway, 1973-95: Has the decrease levelled out? *Tobacco Control*, 6, 27-32.
- Kröger, C. & Hanewinkel, R. (1996). Prävention des Rauchens in der Schule. *Praxis der Klinischen Verhaltensmedizin and Rehabilitation*, 9, 134-139.
- Krosnick, J.A. & Judd, C.M. (1982). Transitions in social influence at adolescence: Who induces cigarette smoking? *Developmental Psychology*, 18, 359-368.
- Künzel-Böhmer, J., Bühringer, G. & Janik-Konecny, T. (1993). *Expertise zur Primärprävention des Substanzmißbrauchs*. Baden Baden: Nomos.
- Laugesen, M. & Meads, S. (1991a). Tobacco advertising restrictions, price, income and tobacco consumption in OECD countries, 1960-1986. *British Journal of Addiction*, 86, 1343-1354.
- Laugesen, M. & Meads, C. (1991b). Advertising, price, income and publicity effects on

- weekly cigarette sales in New Zealand supermarkets. *British Journal of Addiction*, 86, 83-89.
- Leeflang, P.S.H. & Reuijl, J.C. (1985). Advertising and industry sales: An empirical study of the West German cigarette market. *Journal of Marketing*, 49, 92-98.
- Leuenberger, P., Schwartz, U., Ackermann-Liebrich, U., Blaser, K., Bolognini, G., Bongard, J.P., Brandli, O., Braun, P., Bron, C., Brutsche, M., Domenighetti, G., Elsasser, S., Guldemann, P., Hollenstein, C., Hufschmid, P., Karrer, W., Keller, R., Keller-Wossidolo, H., Kunzli, N., Luthi, J.C., Martin, B.W., Medici, T., Perruchoud, A.P., Radaelli, A., Schindler, C., Schoeni, M.H., Solari, G., Tschopp, J.M., Villiger, B., Wuthrich, B., Zellweger, J.P. & Zemp, E. (1994). Passive smoking exposure in adults and chronic respiratory symptoms (SAPALDIA study). *American Journal of Respiratory and Critical Care Medicine*, 150, 1222-1228.
- Leventhal, H. & Keeshan, P. (1993). Promoting healthy alternatives to substance abuse. In S.G. Millstein, A.C. Petersen & E.O. Nightingale (Eds.), *Promoting the health of adolescents: New directions for the twenty-first century* (pp. 260-284). New York: Oxford University Press.
- Leventhal, H., Fleming, R. & Glynn, K. (1988). A cognitive developmental approach to smoking intervention. In S. Macs, C.D. Spielberger, P.B. Defares & I.G. Sarason (Eds.), *Topics in health psychology: Proceedings of the first annual expert conference in health psychology* (pp. 79-105). New York: Wiley.
- Loudon, D.L. & Della Bitta, A.J. (1993). *Consumer behavior: Concepts and applications*. New York: McGraw-Hill.
- Luik, J.C. (Ed.) (1994). *Do tobacco advertising bans really work? A review of the evidence*. The Niagara Institute, Ontario, Canada.
- Lynch, B.S. & Bonnie, R.J. (Eds.) (1994). *Growing up tobacco free. Preventing nicotine addiction in children and youths*. Washington, DC: National Academy Press.
- Maddahian, E., Newcomb, M.D. & Bentler, P.M. (1988). Adolescent drug use and intention to use drugs: Concurrent and longitudinal analyses of four ethnic groups. *Addictive Behaviors*, 13, 191-195.
- Marcoux, B.C. & Shope, J.T. (1997). Application of the theory of planned behavior to adolescent use and misuse of alcohol. *Health Education Research*, 12, 323-331.
- McBride, C.M., Curry, S.J., Cheadle, A., Anderman, C., Wagner, E.H., Diehr, P. & Psaty, B. (1995). School-level application of a social bonding model to adolescent risk-taking behavior. *Journal of School Health*, 65, 63-68.
- McDonald, C. (1992). *How advertising works. A review of current thinking*. NTC Publications: Biddles.
- McGee, R. & Stanton, W.R. (1993). A longitudinal study of reasons for smoking in adolescence. *Addiction*, 88, 265-271.
- Meier, K.S. (1991). Tobacco truths: The impact of role models on children's attitudes toward smoking. *Health Education Quarterly*, 18, 173-182.
- Michel, L. (1997). Loud, sad or bad: Young people's perceptions of peer groups and smoking. *Health Education Research*, 12, 1-14.
- Mindell, J.S. (1993). The UK voluntary agreement on tobacco advertising: A comatose policy? *Tobacco Control*, 2, 209-214.
- Minkler, M., Wallack, L. & Madden, P. (1987). Alcohol and cigarette advertising in Ms. magazine. *Journal of Public Health Policy*, 8, 164-169.
- Mittag, W. & Onnen, A. (1991). Rauchen, Alkohol- and Medikamentenkonsum. Zur Prävalenz von gesundheitlichem Risikoverhalten. *psychomed*, 3, 118-123.
- Newcomb, M.D. & Bentler, P.M. (1986). Frequency and sequence of drug use: A longitudinal study from early adolescence to young adulthood. *Journal of Drug Education*, 16, 101-120.
- Newcomb, M.D. & Bentler, P.M. (1988a). *Consequences of adolescent drug use: Impact on the lives of young adults*. Newbury Park, CA: Sage.
- Newcomb, M.D. & Bentler, P.M. (1988b). Impact of adolescent drug use and social support on problems of young adults: A longitudinal study. *Journal of Abnormal Psychology*, 97, 64-75.

- Newcomb, M.D. & Bentler, P.M. (1989). Substance use and abuse among children and teenagers. *American Psychologist*, *44*, 242-248.
- Newcomb, M.D. (1992). Understanding the multidimensional nature of drug use and abuse: The role of consumption, risk factors, and protective factors. In M. Glantz & R. Pickens (Eds.), *Vulnerability to drug abuse* (pp. 255-297). Washington, DC: American Psychological Association.
- Newcomb, M.D. (1994). Drug use and intimate relationships among women and men: Separating specific from general effects in prospective data using structural equation models. *Journal of Consulting and Clinical Psychology*, *62*, 463-476.
- Newcomb, M.D., Maddahian, E. & Bentler, P.M. (1986). Risk factors for drug use among adolescents: Concurrent and longitudinal analyses. *American Journal of Public Health*, *76*, 625-630.
- Nowak, R. (1995). New studies trace the impact of tobacco advertising. *Science*, *270*, 573-574.
- Nutbeam, D. (1997). Comprehensive approaches to smoking prevention among youth. Paper given at the "14<sup>th</sup> International Symposium Health Behaviour in Adolescence: Theoretical Concepts and Evaluation of Prevention Programs". Bielefeld, 26.-27.9.1997.
- Øygard, L., Klepp, K.I., Tell, G.S. & Vellar, O.D. (1995). Parental and peer influences on smoking among young adults: Ten-year follow-up of the Oslo youth study participants. *Addiction*, *90*, 561-569.
- Paavola, M., Vartiainen, E. & Puska, P. (1996). Predicting adult smoking: The influence of smoking during adolescence and smoking among friends and family. *Health Education Research*, *11*, 309-315.
- Penning, M. & Barnes, G.E. (1982). Adolescent marijuana use: A review. *The International Journal of the Addictions*, *17*, 749-791.
- Pekurinen, M. (1991). Economic aspects of smoking. In National Agency for Welfare and Health (Ed.), *Research Reports* (Vol. 16, pp. 271-273). Helsinki.
- Petermann, F. (1996). Tabakwerbung und Rauchverhalten. *Therapiewoche*, *16*, 852-856.
- Peters, J., Betson, C.L., Hedley, A.J., Lam, T.H., Ong, S.G., Wong, C.M. & Fielding, R. (1995). Recognition of cigarette brand names and logos by young children in Hong Kong. *Tobacco Control*, *4*, 150-155.
- Peto, R., Lopez, A.D., Boreham, J., Thun, M. & Heath, C. (1994). *Mortality from smoking in developed countries 1950-2000*. Oxford: Oxford University Press.
- Peto, R., Lopez, A.D., Boreham, J., Thun, M. & Heath, C. (1996). Mortality from smoking worldwide. *British Medical Journal*, *52*, 12-34.
- Petratis, J., Flay, B.R. & Miller, T.Q. (1995). Reviewing theories of adolescent substance use: Organizing pieces in the puzzle. *Psychological Bulletin*, *117*, 67-86.
- Pierce, J.P., Choi, W.S., Gilpin, E.A., Farkas, A.J. & Berry, C.C. (1998). Tobacco industry promotion of cigarettes and adolescent smoking. *Journal of the American Medical Association*, *279*, 511-515.
- Pierce, J. P., Gilpin, E. A., Burns, D. M., Whalen, E., Rosbrook, B., Shopland, D. & Johnson, M. (1991). Does tobacco advertising target young people to start smoking? *Journal of the American Medical Association*, *266*, 3154-3158.
- Pierce, J.P. & Gilpin, E.A. (1995). A historical analysis of tobacco marketing and the uptake of smoking by youth in the United States: 1890-1977. *Health Psychology*, *14*, 500-508.
- Pierce, J.P., Lee, L. & Gilpin, E.A. (1994). Smoking initiation by adolescent girls, 1944 through 1988. *Journal of the American Medical Association*, *271*, 608-611.
- Piha, T. (1995). *New provisions for tobacco control in Finland*. Helsinki: Ministry of Social Affairs and Health.
- Pohjanpää, A.K.J., Rimpelä, A.H., Rimpelä, M. & Karvonen, J.S. (1997). Is the strong positive correlation between smoking and use of alcohol consistent over time? A study of Finnish adolescents from 1977 to 1933. *Health Education Research*, *12*, 25-36.
- Pollay, R.W. & Lavack, A. (1993). The targeting of youth by cigarette marketers: Archival evidence on trial. In McAlister, L. & Rothschild, M.L. (Eds.), *Advances in Consumer Research* (Vol. 20, pp. 266-271). Provo: Association for Consumer Research.

- Pollay, R.W. (1994a). Exposure of US youth to cigarette television advertising in the 1960s. *Tobacco Control*, 3, 130-133.
- Pollay, R.W. (1994b). Promises, promises: Self-regulation of US cigarette broadcast advertising in the 1960s. *Tobacco Control*, 3, 134-144.
- Pollay, R.W. (1995a). Targeting tactics in selling smoke: Youthful aspects of 20th-century cigarette advertising. *Journal of Marketing Theory and Practice*, 3, 1-22.
- Pollay, R.W. (1995b). "Below the belt" cigarette advertising. *Tobacco Control*, 4, 188-191.
- Pollay, R.W. (1997). Hacks, flacks and counter-attacks: Cigarette advertising, research and controversies. *Journal of Social Issues*, 53, 53-74.
- Pollay, R.W., Siddarth, S., Siegel, M., Haddix, A., Merrit, R.K., Giovino, G.A. & Eriksen, M.P. (1996). The last straw? Cigarette advertising and realized market shares among youth and adults, 1979-1993. *Journal of Marketing*, 60, 1-16.
- Preuß, U.W., Schröter, A. & Soyka, M. (1997). Typologien der Alkoholabhängigkeit – ein kritischer Vergleich. *Sucht*, 43, 92-103.
- Puska, P., Korhonen, H., Uutela, A. & Piha, T. (im Druck). Progress with antismoking policy in Finland. *Tobacco Control*.
- Remerschmidt, H. (1992). *Adoleszenz. Entwicklung and Entwicklungskrisen im Jugendalter*. Stuttgart: Thieme.
- Reuijl, J. C. (1982). *On the determination of advertising effectiveness: An empirical study of the German cigarette market*. Boston: Kluwer Nijhoff.
- Richards, J.W., DiFranza, J.R., Fletcher, C. & Fischer, P.M. (1995). RJ Reynolds "Camel Cash": Another way to reach kids. *Tobacco Control*, 4, 258-260.
- Rietz, C., Rudinger, G. & Andres, J. (1996). Lineare Strukturgleichungsmodelle. In E. Erdfelder, R. Mausfeld, T. Meiser & G. Rudinger (Publisher), *Handbuch Quantitative Methoden* (pp. 253-268). Weinheim: Psychologie Verlags Union.
- Rimpelä, M., Aarø, L.E. & Rimpelä, A.H. (1993). The effects of tobacco sales promotion on initiation of smoking. Experiences from Finland and Norway. *Scandinavian Journal of Social Medicine*, 49, 5-49.
- Robins, L.N. (1980). The natural history of drug abuse. *Acta Psychiatrica Scandinavica*, 62 (Suppl. 284), 7-20.
- Rombouts, K. & Fauconnier, G. (1988). What is learned early is learned well? A study of the influence on tobacco advertising on adolescents. *European Journal of Communication*, 3, 303-322.
- Rutter, M. (1994). Beyond longitudinal data: Causes, consequences, changes, and continuity. *Journal of Consulting and Clinical Psychology*, 62, 928-940.
- Schooler, C., Feighery, E. & Flora, J.A. (1996). Seventh graders' self-reported exposure to cigarette marketing and its relationship to their smoking behavior. *American Journal of Public Health*, 86, 1216-1221.
- Schwarzer, R. (1996). *Psychologie des Gesundheitsverhaltens* (2. Aufl.). Göttingen: Hogrefe.
- Semmer, N., Cleary, P.D., Dwyer, J.H., Fuchs, R. & Lippert, P. (1987). Psychosocial predictors of adolescent smoking in two German cities: The Berlin-Bremen-Study. *Morbidity and Mortality Weekly Report*, 36, 3-10.
- Shean, R.E., de Klerk, N.H., Armstrong, B.K. & Walker, N.R. (1994). Seven-year follow-up of a smoking-prevention program for children. *Australian Journal of Public Health*, 18, 205-208.
- Sieber, M. (1993). *Drogenkonsum: Einstieg and Konsequenzen. Ergebnisse von Längsschnittuntersuchungen and deren Bedeutung für die Prävention*. Bern: Huber.
- Sieber, M. (1995). Unterschätzte Gefährdungspotentiale des Tabakmißbrauchs. Ergebnisse einer Metaanalyse von Längsschnittstudien. In Deutsche Hauptstelle gegen die Suchtgefahren (Publisher), *Jahrbuch Sucht '96* (pp. 94-102). Geesthacht: Neuland.
- Siegel, M., Nelson, D.E., Peddicord, J.P., Merrit, R.K., Giovino, G.A. & Eriksen, M.P. (1996). The extent of cigarette brand and company switching: Results from the Adult Use-of-Tobacco Survey. *American Journal of Preventive Medicine*, 12, 14-16.

- Simon, R., Bühringer, G., Wiblishauser, P. (1992). *Repräsentativerhebung 1990 zum Konsum and Mißbrauch von illegalen Drogen, alkoholischen Getränken, Medikamenten and Tabakwaren*. Bonn: Bundesministerium für Gesundheit.
- Slade, J. (1993). High participation rates in cigarette brand promotions. *Tobacco Control*, 2, 248-249.
- Solomon, M. R. (1994). *Consumer behavior: Buying, having and being*. Boston: Allyn and Bacon.
- Stacey, B. G. (1982). Economic socialization in the pre-adult years. *British Journal of Social Psychology*, 21, 159-173.
- Stacy, A.W., Bentler, P.M. & Flay, B.R. (1994). Attitudes and health behavior in diverse populations: Drunk driving, alcohol use, binge eating, marijuana use, and cigarette use. *Health Psychology*, 13, 73-85.
- Stacy, A.W., Sussman, S., Dent, C.W., Rurton, D. & Flay, B.R. (1992). Moderators of peer social influence in adolescent smoking. *Personality and Social Psychology Bulletin*, 18, 163-172.
- Stanton, W.R., McClelland, M., Elwood, C., Ferry, D. & Silva, P.A. (1996). Prevalence, reliability and bias of adolescent' reports of smoking and quitting. *Addiction*, 91, 1705-1714.
- Stanton, W.R., Silva, P.A. & Oei, T.P.S. (1989). Prevalence of smoking in a Dunedin sample followed from age 9 to 15 years. *New Zealand Medical Journal*, 102, 637-639.
- Statistisches Bundesamt (Publisher) (1996). *Fachserie 12: Gesundheitswesen, Reihe S. 3: Fragen zur Gesundheit 1995*. Stuttgart: Metzler-Poeschel.
- Steptoe, A., Wardle, J., Smith, H., Kopp, M., Skrabiski, A., Vinck, J. & Zotti, A.M. (1995). Tobacco smoking in young adults from 21 European countries: Association with attitudes and risk awareness. *Addiction*, 90, 571-582.
- Strasburger, V.C. (1995). *Adolescents and the media: Medical and psychological impact. Developmental Clinical Psychology and Psychiatry. Vol. 33*. Thousands Oaks, CA: Sage.
- Sussman, C., Dent, C.W., Burton, D., Stacy, A.W. & Flay, B.R. (1995). *Developing school-based tobacco use prevention and cessation programs*. Thousands Oaks, CA: Sage.
- Sussman, S., Dent, C.W., McAdams, L.L., Stacy, A.W., Burton, D. & Flay, B.R. (1994). Group self-identification and adolescent cigarette smoking: A 1-year prospective study. *Journal of Abnormal Psychology*, 103, 576-580.
- Sussman, S., Dent, C.W., Stacy, A.W., Burciaga, C., Raynor, A., Turner, G.E., Charlin, V., Craig, S., Hansen, W.B., Burton, D. & Flay, B.R. (1990). Peer group association and adolescent tobacco use. *Journal of Abnormal Psychology*, 99, 349-352.
- Sussman, S., Dent, C.W., Stacy, A.W., Hodgson, C.S., Burton, D. & Flay, B.R. (1993). Implementation, process, and immediate outcome evaluation of Project Towards No Tobacco Use. *Health Education Research*, 8, 109-123.
- Sutton, S. (1989). Smoking attitudes and behavior: Applications of Fishbein and Ajzen's theory of reasoned action to predicting and understanding smoking decisions. In T. Ney & A. Gale (Eds.), *Smoking and human behavior* (pp. 289-312). Chichester: Wiley.
- Stünzner, W.v. (1994). *Psychosoziale Bedingungen des Rauchens*. Frankfurt am Main: Peter Lang.
- Swaim, R.C., Oetting, E.R. & Casas, J.M. (1996). Cigarette use among migrant and nonmigrant Mexican American youth: A socialization latent-variable model. *Health Psychology*, 15, 269-281.
- Tobler, N.C. (1986). Meta-analysis of 143 adolescent drug prevention programs: Quantitative outcome results of program participants compared to a control comparison group. *Journal of Drug Issues*, 16, 537-567.
- Tölle, R. & Buchkremer, G. (1989). *Zigarettenrauchen. Epidemiologie, Psychologie, Pharmakologie und Therapie* (2. Aufl.). Berlin: Springer.
- Toxic Substances Board (1989). *Health or tobacco: An end to tobacco advertising and promotion*. Wellington: Health Promotion, Department of Health.
- True, W.R., Heath, A.C., Scherrer, J.F., Waterman, B., Goldberg, J., Lin, N., Eisen, S.A., Lyons, M.J. & Tsuang, M.T. (1997). Genetic and environmental contributions to smoking. *Addiction*, 92, 1277-1287.

- Tschann, J.M., Adler, N.E., Irwin, C.E., Millstein, S.G., Turner, R.A. & Kegeles, S.M. (1994). Initiation of substance use in early adolescence: The roles of pubertal timing and emotional distress. *Health Psychology, 13*, 326-333.
- UK Department of Health (1992). *Effect of tobacco advertising on tobacco consumption: A discussion document reviewing the evidence*. London.
- Unger, J.B., Johnson, C.A. & Rohrbach, L.A. (1995). Recognition and liking of tobacco and alcohol advertisements among adolescents: Relationships with susceptibility to substance use. *Preventive Medicine, 24*, 461-466.
- U.S. Department of Health and Human Services (1989). *Reducing the health consequences of smoking: 25 years of progress: A report of the Surgeon General*. Washington: U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- U.S. Department of Health and Human Services (1994). *Preventing tobacco use among young people: A report of the Surgeon General*. Washington: U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- Vartiainen, E. (1997). Antecedents of smoking behavior in adolescence. Paper given at the "14<sup>th</sup> International Symposium Health Behaviour in Adolescence: Theoretical Concepts and Evaluation of Prevention Programs". Bielefeld, 26.-27.9.1997.
- Vartiainen, E., Paavola, M., McAlister, A. & Puska, P. (1998). Fifteen-year follow-up of smoking prevention effects in the North Karelia Youth Project. *American Journal of Public Health, 88*, 81-85.
- verband der cigarettensindustrie (vdc) (1998). *Werbeverbote and cigarettensproduktion*. Bonn (unpublished statistical data).
- Wahlgren, D.R., Hovell, M.F., Slymen, D.J., Conway, T.L., Hofstetter, C.R. & Jones, J.A. (1997). Predictors of tobacco use initiation in adolescents: A two-year prospective study and theoretical discussion. *Tobacco Control, 6*, 95-103.
- Warheit, G.J., Biafora, F.A., Zimmerman, R.S., Gil, A.G., Vega, W.A. & Apspori, E. (1995). Self-rejection/derogation, peer factors, and alcohol, drug, and cigarette use among a sample of Hispanic, African-American, and white non-Hispanic adolescents. *The International Journal of the Addictions, 30*, 97-116.
- Warner, K. E., Goldenhar, L. M. & McLaughlin, C. G. (1992). Cigarette advertising and magazine coverage of the hazards of smoking: A statistical analysis. *New England Journal of Medicine, 326*, 305-309.
- Wetterer, A. & Troschke, J.v. (1986). *Smoker motivation. A review of contemporary literature*. Berlin: Springer.
- Whelan, E., Sheridan, M. J., Meister, K. A. & Mosher, B. A. (1981). Analysis of coverage of tobacco hazards in women's magazines. *Journal of Public Health Policy, 2*, 28-35.
- While, D., Kelly, S., Huang, W. & Charlton, A. (1996). Cigarette advertising and onset of smoking in children: Questionnaire survey. *British Medical Journal, 313*, 398-399.
- White, H.R., Johnson, V. & Horwitz, A. (1986). An application of three deviance theories to adolescent substance use. *The International Journal of the Addictions, 21*, 347-366.
- Wiist, W.H. & Snider, G. (1991). Peer education in friendship cliques: Prevention of adolescent smoking. *Health Education Research, 6*, 101-108.
- Yoshikawa, H. (1994). Prevention as cumulative protection: Effects of early family support and education on chronic delinquency and its risks. *Psychological Bulletin, 115*, 28-54.
- Zajonc, R.B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist, 35*, 151-175.
- Zentralverband der deutschen Werbewirtschaft (Publisher) (1997). *Werbung in Deutschland 1997*. Bonn: edition ZAW

- Zimring, F.E. & Nelson, W. (1995). Cigarette taxes as cigarette policy. *Tobacco Control*, 4 (suppl 1), S25-S33.
- Zuckerman, M. (1993). P-impulsive sensation seeking and its behavioral, psychophysiological and biochemical correlates. *Neuropsychobiology*, 28, 30-36.
- Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. Cambridge: Cambridge University Press.
- Zuckerman, M., Ball, S. & Black, J. (1990). Influences of sensation seeking, gender, risk appraisal, and situational motivation on smoking. *Addictive Behaviors*, 15, 209-220.