

3.4 PERSONALITY AND SMOKING

This study focuses on the investigation of the predictive role of personality characteristics in the development of smoking behavior. Therefore, the predicting effects of the Big Five personality factors are investigated in the framework of a longitudinal quasi-experimental school-focused primary prevention program. Moreover, it is studied whether personality characteristics influence the intention to smoke in adolescent age.

Social-skills training programs in drug prevention were found relatively highly effective in the U.S.A. (Botvin & Griffin, 2002). In this part of the thesis the effectivity of a social-skills training program is also studied empirically in the German school system.

3.4.1 Introduction

Smoking stays the focus of many school oriented prevention studies. Today hundreds of thousands of individuals die each year because of late or related effects of smoking. Yet, cigarettes belong to the legal goods and can be bought without any difficulties almost everywhere. There is also little hope that tobacco will be eliminated from our daily lives and environments in the foreseeable future. It is known that almost every third adolescent smokes and very few of them manage to quit again. In spite of all the medical warnings, smoking is still part of the common behavioral pattern in adolescence and the great majority of adolescent smokers remain habitual tobacco consumers into adulthood (Heppekausen, Kröger & Reese, 2001).

Smoking has also developmental functions; for example, it provides a means of coping with developmental and daily hassles (Kolip & Hurrelmann, 1995). Therefore, it is of utmost importance to prevent young individuals from the onset from smoking and, at the same time, to provide healthy coping alternatives that enable them to master the developmental tasks. One of the first steps toward this goal is to investigate which factors help individuals on their way to remain “free” of this addiction. Personality characteristics form one of the possible factors in the complex and multi-factorial pattern of prevention.

Adolescent substance use and abuse is a multi-faceted phenomenon. It involves not only personality, but also genetic, social and environmental components (Thomas & Schandler, 1996). Even the age of smoking initiation is facilitated by various social and environmental changes in adolescence (Tripathi, Rakesh & Kumar, 2001). In spite of it all, one of the main tasks of primary prevention is the investigation of the relevant factors that contribute to the variation of health related behavior (Jessor, Turbin & Costa, 1999).

Tobacco consumption fulfills a developmental function in adolescent age (Franzkowiak, 1986) and is interpreted by adolescents as an attribute of adulthood (Hesse, 1993). This functionality of smoking makes it difficult for any intervention program to achieve a change in adolescents' attitudes and make adolescents turn their backs to smoking as an alternative coping strategy. Teenagers try out new ways of behavior in adolescence; they learn new ways to react to the social environment. From a developmental perspective it can be seen that when new behavioral answers are formed and they turn out to be successful for the individual (like acceptance in the relevant age group through smoking), they change into durable behavioral patterns and become habitual (Hurrelmann, 1991). The danger of becoming a regular smoker is, today, still too high, especially because of the acceptance of cigarette smoking in society and the strong influence of the media. These factors weaken the effectivity and preventive potential of an intervention, specifically if it is conducted in isolation and not as part of a communal and global project (Vartiainen, 1999). Moreover, tobacco smoking can help the integration of a less favorable positioned individual (like newcomers, financially weaker individuals) into the age group and, therefore, facilitate the fulfillment of an important developmental task (Engel & Hurrelmann, 1983). For school oriented primary prevention, and for prevention in general as well, it is important to reach a persistent effect that continues over the trial behavior phase and prevents a real onset of smoking, an onset of habitual tobacco consumption.

3.4.2 Personality as a protective factor

Under the so-called “theory of problem behavior”, Jessor and Jessor (1977) investigated the role of psychosocial risk and of protective factors in young adult development. Later, Jessor et al. (1999) provided a detailed view of the nature of protective factors which they divided into proximal and distal variables. The proximal variables were the ones that exerted a direct, moderating influence on health relevant behavior (like internal control of health) and on health relevant social support (like healthy parental modeling). They sorted the distal variables as the ones that had a mediating, rather indirect and protective relation to health relevant behavior. Jessor et al. (1999) concluded, in their longitudinal empirical study with U.S. adolescents, that the protective factors explained the variance in health behavior better than the risk factors. They found that protective factors not only exerted a direct positive influence on healthy behavior, but also formed a buffer against the negative influence of risk factors. Both proximal and distal protective factors played an important role in the development of healthy behavioral patterns and Jessor et al. (1999) emphasized also including distal factors in the prevention and health promotion research in order to be able to develop more effective health promotion and prevention programs in adolescence (Jessor et al., 1999).

3.4.3 Current research results on the protective role of personality factors in smoking

The role of the Big Five factors was studied with respect to substance abuse in a community based longitudinal study (Lynam, Leukefeld & Clayton, 2003). It was found that the Big Five factors Agreeableness and Conscientiousness accounted for substance use and abuse behavior, while no gender differences occurred. Lemos-Giraldez and Fidalgo-Aliste (1997) came to similar results when they reported that, of the Big Five dimensions, only Conscientiousness and Agreeableness predicted significantly future health behavior and attitudes. Another personality-oriented study on novelty seeking indicated a higher vulnerability to smoking in adolescent age (Tercyak & Audrain-McGovern, 2003). Acton (2003) found that from the biologically based personality dimensions it was impulsivity that played an important role in

substance abuse. In the longitudinal sample of Spanish adolescents, Psychoticism was found as a significant predictor of future smoking (Canals, Blade & Domenech, 1997). Burt, Dihn, Peterson and Sarason (2000) found rebelliousness and risk-taking to be predictive in a longitudinal adolescent smoking prevention study. The relationship between smoking and emotional intelligence was explored in a school-focused multi-ethnic adolescent study and it was found that emotional intelligence correlated negatively with smoking (Trinidad & Johnson, 2002). Emotionally intelligent adolescents were essentially able to detect social pressure and better understood the intention of others; therefore, they were also more resistant to negative social influences. Temperament related characteristics were found effective in adolescent smoking (Wills et al., 2001). Good self-control not only affected academic achievement, but also led to a lower level of substance use in adolescent age while peers played an important moderating role. A school environment of disapproval was found to play a protective role for students who, themselves, had no negative attitude toward smoking (Kumar, O'Malley, Johnston, Schulenberg & Bachman, 2002). Sneed (2002) found a relationship between social-skills and Agreeableness in adolescents.

Summarizing, of the personality variables that were found to be related to smoking, particularly the two Big-Five dimensions, Conscientiousness and Agreeableness were relevant. In the present empirical study the validity and transferability of these results are empirically studied and possible consequences for further research are discussed.

3.4.4 Method

Current smoking behavior and the intention to smoke were assessed in the relation to personality characteristics as measured by a Big Five inventory (see sections 2.2 and 3.2). Short-term effects of approximately five months (W4) and long-term effects of a year (W5) were measured regarding current smoking behavior and future intentions to smoke. Logistic regression analyses were conducted for the total group of subjects and for boys and girls separately for both dependent variables.

3.4.5 Subjects

According to the two dependent variables, current smoking behavior and future intention to smoke, two different samples were selected from the total sample of 1212 adolescents (see Table 1, p. 41). Smoking behavior and smoking intention was measured in W4 and W5 when the students were, on average, 12.1 (SD = .70) and 13.1 (SD = .50) years old, respectively. In the following, some more relevant characteristics of the two samples of subjects are presented separately.

Current tobacco consumption

Altogether, 988 adolescents were selected from the major subject pool of the longitudinal study for the analysis about the relationship between current tobacco consumption and personality (Table 13, p. 106). These 988 students all reported either never having had smoked or only having tried a cigarette once in their life before the first wave of the investigation presented here (W3). In this way, results were collected from 486 male and 494 female adolescents (8 gender unknown). In the short-term questioning (W4) on current tobacco consumption, 782 students participated, 409 girls and 368 boys. Those students, who reported to have already quit smoking (46 students), were excluded from the analyses. It is unlikely that they developed habitual smoking within five months and also managed to quit in that short period. The aim was not to influence the results through unclear categorizations, and so it was better to exclude this group of subjects from further analyses. For the long-term analyses (W5), altogether 543 adolescents were selected (292 girls, 249 boys, 2 gender unknown). At the first personality relevant questioning (W3) in the intervention classes there were 435 students and in the control classes 553 students.

Future intention to smoke

Those students who reported not having any intention to smoke or who were quite sure about not wanting to smoke in the future at W3 (Table 14, p. 107) were included in the analyses. A total of 1064 adolescents were selected, 551 boys and 503 girls (10 gender unknown). At W3

there were 496 students in the intervention classes and 600 students in the control classes. Data were collected at W4 from 894 students but for the short-term logistic regression analyses only 829 participants were eligible. Those adolescents who reported to be completely unsure about their intention to smoke in the short-term questioning ($N = 65$) were excluded from the group of subjects. They belonged neither to the ones who could imagine starting smoking nor to the ones who could not. As this group was rather large (65 adolescents), and no decision could be made regarding their attitude toward smoking, it was better to exclude them and consider them a separate category of subjects. The same procedure was followed in the long-term evaluation resulting in a total of 583 subjects for the logistic regression analyses.

3.4.6 Measures

The drug relevant scales (see Appendix C) and the adapted FFPI were presented as part of the large battery (see Appendix E). Current tobacco consumption was measured by the question “Hast Du schon einmal Zigaretten geraucht?” [Have you ever smoked?]. There were five possible replies specified: 1 = “no, never”, 2 = “yes, but only tried”, 3 = “yes, but already quit”, 4 = “yes, occasionally”, 5 = “yes, regularly”. These answers were for the logistic regression analysis summarized to “no” (1 + 2 = “never”, “only tried”) and “yes” (4 + 5 = “occasionally” and “regularly”). The groups of students who reported having already quit were not included in the analyses because it was unclear whether they quit habitual smoking or tried smoking for a short-term period. Trying one cigarette can hardly be considered “consumption” behavior, but rather a behavior of curiosity that is typical for the age group. Often, those who just tried one cigarette consider themselves nonsmokers. Furthermore, at this age there is no stability during patterns of consumption in the group of smokers; adolescents tend to smoke together with others, at parties or in group situations, especially under certain circumstances. It is, therefore, better to speak of non-consumers versus consumers. Mazanov and Byrne (2002) also administered a similar method in their study of

the predictive value of adolescents' current smoking and intention to smoke.

Future intention to smoke was measured by the item: "Hast Du vor in der nächsten Zeit zu rauchen?" [Do you intend to smoke in the near future?]. The answers ranged from 1 = "surely not", 2 = "rather not", 3 = "perhaps", 4 = "rather yes" to 5 = "surely yes". These replies were also dichotomized into "yes" ("rather yes" + "surely yes") and "no" ("rather not" + "surely not"). In this case, the sample was divided into the group of adolescents who were not intending to start smoking and those who thought about starting smoking in the future. The groups of unsure adolescents, who replied with "perhaps", were categorized as separate groups and were not included in the personality relevant analyses in all the measurement sequences.

3.4.7 Results

In the following, the frequencies and the personality relevant results are presented separately for the two dependent variables.

Frequencies - current smoking

As presented in Table 13, at W3 a large majority of the students were non-consumers, 60 percent ($N = 718$) reported having never smoked at all, 23 percent ($N = 270$) reported to have tried a cigarette, ten percent ($N = 120$) reported having quit smoking already (here again, it is probably a trial behavior) and seven percent ($N = 88$) reported smoking (5% occasionally and 2% regularly).

For further frequency analyses only those students were included who reported having never smoked or just to having tried smoking ($N = 988$) at the first personality relevant measurement sequence (W3).

From the non-consuming group of adolescents in the short-term measurement sequence, also approximately five months after the first personality relevant questioning, (W4; $N = 828$) ten percent ($N = 80$) reported having started smoking to some extent. Six percent ($N = 46$) said to have quit already, three percent ($N = 23$) said to smoke occasionally

and one percent ($N = 11$) to smoke regularly.

At W5 the group of non-consumers was 85 percent ($N = 500$) of the total group ($N = 550$). At this measurement sequence eight percent ($N = 49$) reported having quit smoking, four percent ($N = 24$) reported smoking occasionally and three percent ($N = 19$) regularly. This means a group of 19 adolescent regular smokers in subject pool at the last measurement sequence. The growing number of smokers showed up obviously in the results, the group of nonsmokers was shrinking and the group of occasional and regular smokers was enlarged from zero to seven percent ($N = 43$) in the selected sample within a year long period.

Table 13. The frequencies of „current tobacco consumption“.

Have you ever smoked?	W3 ¹			W4 ²			W5 ³		
	total	girls	boys	total	girls	boys	total	girls	boys
No, never	718	374	336	543	297	242	321	175	146
Yes, but only tried	270	120	150	205	95	109	179	95	82
Yes, but already quit	120	41	77	46	17	27	49	26	23
Yes, occasionally	62	26	36	23	10	13	24	14	10
Yes, regularly	26	11	15	11	7	4	19	8	11
Total	1196	572	614	828	426	395	592	318	272

Note: because of the missing values, N may differ from column to column in the table;

1 = first personality relevant measurement in the sixth grade; 2 = second measurement approximately five months later; 3 = third measurement in the seventh grade one year after the first measurement.

Only those students participated in this study who reported having never smoked or just to have tried smoking before the first personality relevant questioning (W3). The calculations for the short- (W4) and long-term (W5) frequencies rely only on participants of this particular sample (N written **bold**). The number of participants written *cursiv* were excluded from all analyses.

Frequencies - future intention to smoke

At W3 88 percent ($N = 1064$) were sure or rather sure of the intention not to smoke at all in the near future (Table 14). From these adolescents, ten percent ($N = 91$) changed their minds in the short-term period. Seven percent ($N = 65$) of them reported being undecided about their intention towards smoking, one percent ($N = 11$) thought it possible to start smoking and two percent ($N = 15$) of the adolescents were sure about intending to smoke in

the future. In the long-term evaluation ($N = 630$) 87 percent ($N = 550$) of the participants did not intend to smoke, seven percent ($N = 47$) were undecided, two percent ($N = 12$) thought it possible to start smoking in the near future and three percent ($N = 21$) were sure of the intention to smoke. When looking at the gender specific level, it showed, that in the longitudinal questioning approximately twice as many boys ($N = 13$) as girls ($N = 7$) reported being sure about wanting to smoke. Nevertheless, the low frequencies showed that students were in the phase of the early onset of smoking behavior during the examination period of the present study.

Table 14. The frequencies of „future intention to smoke“.

Do you intend to smoke in the near future?	W3 ¹			W4 ²			W5 ³		
	total	girls	boys	total	girls	boys	total	girls	boys
Surely, don't	958	454	494	719	360	353	466	241	224
Rather, don't	106	49	57	84	40	44	84	44	40
<i>Perhaps</i>	98	46	57	65	31	34	47	30	17
Rather, do	19	10	9	11	3	7	12	6	4
Surely, do	31	11	19	15	4	11	21	7	13
Total	1212	570	631	894	438	449	630	328	300

Note: because of the missing values, N may differ from column to column in the table;

1 = first personality relevant measurement in the sixth grade; 2 = second measurement approximately five months later; 3 = third measurement in the seventh grade one year after the first measurement.

Only those students participated in this study who reported to be sure, or rather sure about their intention not to smoke in the near future at the first personality relevant questioning (W3). The calculations for the short- (W4) and long-term (W5) frequencies rely only on participants of this particular sample (N written **bold**). The number of participants written *cursiv* were excluded from all analyses.

3.4.7.1 The role of personality in smoking

Longitudinal results were restricted to the surveys in the sixth (W4) and seventh grade (W5),

and to a maximum period of one-year. The possible predictive role of the personality

characteristics regarding self-reported current smoking behavior was measured in the group of

non-consumers at the beginning of grade six (W3). Intention to smoke was measured in the

group of those, who were sure or rather sure at W3 about not starting to smoke in the future.

3.4.7.2 Current smoking behavior

In the prediction model the FFPI scales Extraversion ($\alpha = .77$), Agreeableness ($\alpha = .79$), Conscientiousness ($\alpha = .73$), Emotional Stability ($\alpha = .81$), Autonomy ($\alpha = .70$), and the intervention program with the tobacco specific contents of the sixth grade were included. The role of the personality factors was studied by means of multiple logistic regression analyses. Wald statistics were computed indicating the strength of the predicting value of the personality factors in the prediction model as described by Hosmer and Lemeshow (2000).

At the beginning of the logistic regression analysis, with a stepwise forward method (in SPSS named as forward LR), the predictors were entered and their major effects were tested. In a second step, the interactions between the personality predictors and the prevention program were also tested (e.g., Extraversion x prevention program, Agreeableness x prevention program, etc.). The interactions between the personality dimensions and the prevention program played no significant role in the prediction model and so they were excluded from further analyses. The logistic regression analyses with the dependent variable “current smoking behavior” were computed six times: both for the short-term and long-term effects first in the total group of subjects, next in the group of girls and last in the group of boys.

Table 15. Classification table: The predictive role of personality in current tobacco consumption.

Short-term (W4)

		Predicted Smoking		Corrected Percentages
		1	2	
Observed	1	599	1	99,8
Smoking	2	23	0	0
		622	1	96,1

Note: 1 = never, only tried; 2 = occasionally, regularly

Table 16. The predictive role of personality in current tobacco consumption.

Short-term (W4)

Model chi-square	24,79
Degrees of freedom	4
Statistical significance of the model (p-value)	< .001
-2 Log Likelihood	171,11
Nagelkerke's adjusted R ²	.14

Individual predictors

<u>Independent variables</u>	<u>B</u>	<u>SEB</u>	<u>Odds Ratio</u>	<u>Wald Statistic</u>	<u>p</u>
Extraversion	.08	.03	1.09	8.93	< .005
Agreeableness	-.05	.03	.95	4.56	< .05
Conscientiousness	-.07	.03	.93	5.33	< .05
Prevention program	1.16	.48	3.20	5.99	< .05

Note: N = 623

The short-term prediction model as presented in Table 16 proved to be significant ($\chi^2 = 24.79$; $p < .001$). As shown, four of the independent variables appeared to be predictive: Extraversion (Wald statistic = 8.93; $p < .005$), the prevention program (Wald statistic = 5.99; $p < .05$), Conscientiousness (Wald statistic = 5.33; $p < .05$) and Agreeableness (Wald statistic = 4.56; $p < .05$). They let us presume that adolescents who consider themselves conscientious and agreeable become tobacco consumers with a lower probability than those who are quarrelsome and merry-go-lucky. Though the classification tables showed unsatisfying classification results (Table 15), the incident rates suggested a similar solution to the short-term prediction model: only 5.4 percent of the adolescents who said they were highly agreeable and 4.6 percent of those who were highly conscientious in the self-reports reported smoking, in comparison to the 10.2 percent in the group of non-agreeable and 14.6 percent

non-conscientious adolescents.

In the intervention group, the adolescents who reported already having smoked before the prevention were mostly introverted (61.3% introverts and 38.7% extraverts). After the social-skills training the “smokers” were more likely extraverts (54.1% extraverted versus 45.9% introverted). The less beneficial effects of Extraversion and the prevention program also indicated that highly extraverted adolescents reacted to the substance specific social-skills training with an increased curiosity and had only tried out the discussed legal drug in practise. While in the control group during this period 23 percent of the students reported having tried smoking, there were 27 percent in the intervention classes. Specifically, in the group of highly extraverted adolescents who reported having some experience in smoking, only 5.6 percent of the students belonged to the control classes and almost twice as many (10.4%) to the intervention classes. When the subject pool was divided into the group of girls and boys, this effect appeared to be more obvious. 11.7 percent of the extraverted girls from the intervention classes reported having smoked cigarettes after the intervention in the short-term evaluation (W4) while only 3.6 percent did so in the control classes. In the group of boys the distribution showed no differences: 8.6 per cent of the boys in the intervention group reported having smoked and eight percent in the control group had done so. It is, therefore, suggested that the prevention program may have triggered curiosity for experimenting with smoking in the extraverted girls in the intervention group. This argumentation was supported by the short-term gender specific prediction results (Table 18).

Table 17. Classification tables: The short-term gender specific predictive role of personality in current tobacco consumption.

Girls – short-term (W4)

		Predicted Smoking		Corrected Percentages
		1	2	
Observed	1	319	0	100
Smoking	2	14	0	0
		333	0	95,8

Note: 1 = never, only tried; 2 = occasionally, regularly

Boys - short-term (W4)

		Predicted Smoking		Corrected Percentages
		1	2	
Observed	1	278	0	100
Smoking	2	9	0	0
		287	0	96,9

Note: 1 = never, only tried; 2 = occasionally, regularly

Table 18. The predictive role of personality in current tobacco consumption – short-term gender specific results.

Girls - short-term (W4)

Model chi-square	16,22
Degrees of freedom	3
Statistical significance of the model (p-value)	< .005
-2 Log Likelihood	99,92
Nagelkerke's adjusted R ²	.16

Individual predictors

<u>Independent variables</u>	<u>B</u>	<u>SEB</u>	<u>Odds Ratio</u>	<u>Wald Statistic</u>	<u>p</u>
Extraversion	.09	.04	1.09	6.57	< .05
Conscientiousness	-.11	.04	.90	6.30	< .05
Prevention program	1.40	.63	4.04	4.88	< .05

Note: N = 333

Boys - short-term (W4)

Model chi-square	4.63
Degrees of freedom	1
Statistical significance of the model (p-value)	< .05
-2 Log Likelihood	74.41
Nagelkerke's adjusted R ²	.07

Individual predictor

<u>Independent variable</u>	<u>B</u>	<u>SEB</u>	<u>Odds Ratio</u>	<u>Wald Statistic</u>	<u>p</u>
Agreeableness	-.09	.04	.91	4.57	< .05

Note: N = 287

The short-term gender specific prediction model became stronger for girls (Model $\chi^2 = 16.22$; $p < .005$) then for boys (Model $\chi^2 = 4.63$; $p < .05$).

In the group of girls a main effect for Conscientiousness (Wald statistic = 6.30; $p < .05$) was found and two unfavorable effects for Extraversion (Wald statistic = 6.57; $p < .05$) and for the prevention program (Wald statistic = 4.88; $p < .05$) appeared. There was a substantial difference at this level of analysis that is worth a closer look. Particularly in the group of girls, who were extraverted, lively and open and so who were also more open towards smoking were especially in “danger”. The results suggest that trial behavior may occur especially in the group of girls during the prevention program: in the intervention group there were 4.1 percent ($N = 7$) who started and also stopped smoking during the intervention period before W4 while only 1.2 percent ($N = 4$) did so in the control group. Of this small group of adolescent girls, according to their self-reported behavior, none became occasional or regular tobacco consumer at W5 in the intervention group, while in the control group, two of the four became smokers.

In the group of boys there were no signs for trial behavior: as well in the control group as in the intervention group, six percent of the boys reported having a smoking period between W3 and W4. One personality factor seemed to play a moderate predicting role, namely Agreeableness (Wald statistic = 4.57; $p < .05$). However, the classifications failed to support the gender specific prediction models (Table 17). With some caution it can still be presumed what the prediction model suggested; that on the whole, agreeable boys are more certain the ones who remain abstinent from tobacco smoking in adolescence. Still, regarding the relative weakness of the results, more supporting data is needed for further interpretations.

For the total group there were no long-term effects to observe or for the group of girls either. This means that the unfavorable curiosity effects also disappeared in the long-term analyses.

Table 19. Classification table: The long-term gender specific predictive role of personality in current tobacco consumption for boys.

Boys - long-term(W5)

		Predicted Smoking		Corrected Percentages
		1	2	
Observed	1	184	0	100
Smoking	2	13	0	0
		197	0	93,4

Note: 1 = never, only tried; 2 = occasionally, regularly

Table 20. The predictive role of personality in current tobacco consumption – long-term gender specific results.

Boys - long-term (W5)

Model chi-square	4.54
Degrees of freedom	1
Statistical significance of the model (p-value)	< .05
-2 Log Likelihood	91.26
Nagelkerke's adjusted R ²	.06

Individual predictor

<u>Independent variable</u>	<u>B</u>	<u>SEB</u>	<u>Odds Ratio</u>	<u>Wald Statistic</u>	<u>p</u>
Agreeableness	-.08	.04	.93	4.44	< .05

Note: N = 197

Again, in the long-term prediction for the boys, the classification table (Table 19) showed no satisfying results for those who changed their status in current smoking, but the prediction model (Table 20) was significant. This failure in the prediction of the category membership is considered as a rare, but in larger samples an entirely possible case (Menard, 1995). For the boys, the long-term model became statistically significant

(Model $\chi^2 = 4.54$; $p < .05$) and Agreeableness showed a weak one-year prediction effect (Wald statistic = 4.44; $p < .05$). Here, again, some more detailed investigations are necessary to be able to provide further support to the present findings.

3.4.7.3 Intention to smoke

All personality predictors (e.g., Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Autonomy), the prevention program and all possible interactions between the predictors and treatment (e.g., Extraversion x prevention program, Agreeableness x prevention program, etc.) were included in the prediction model. Similarly to the procedure, as described in the case of the dependent variable “current tobacco consumption”, logistic regression analyses with the step forward method were computed. The prediction model, with the interactions between the personality dimensions and the intervention program, did not prove to be significant for any of the subject groups, so for further analyses only the main effects for the personality variables and the prevention program were studied with “future intention to smoke” as a dependent variable.

As represented in Table 22, for the total group, the short-term prediction model (W4) toward future intention to smoke fit ($\chi^2 = 30.29$; $p < .000$) and the results included two of the personality relevant predictor variables, Agreeableness (Wald statistic = 11.76; $p < .005$) and Conscientiousness (Wald statistic = 5.51; $p < .05$), and the prevention program with an unfavorable main effect (Wald statistic = 10.48; $p < .005$). Nevertheless, the classification table (Table 21) here also failed to predict correct category memberships. Looking at the long-term aspects of the study (Table 22), future intention to smoke was asked again at W5, a year after the first (W3) measurement sequence. Here, the gender specific results were not significant and a weak effect ($\chi^2 = 5.73$; $p < .05$) for Emotional Stability (Wald statistic = 5.76; $p < .05$) was found in the total sample.

Table 21. Classification tables: The short and long-term predictive role of personality in future intention to smoke.

Short-term (W4)

		Predicted Smoking		Corrected Percentages
		1	2	
Observed	1	641	0	100
Smoking	2	68	0	0
		709	0	90,4

Note: 1 = surely don't, rather don't; 2 = rather do, surely do

Long-term (W5)

		Predicted Smoking		Corrected Percentages
		1	2	
Observed	1	451	0	100
Smoking	2	64	0	0
		515	0	87,6

Note: 1 = surely don't, rather don't; 2 = rather do, surely do

Table 22. The predictive role of personality in future intention to smoke.

short-term (W4)

Model chi-square	30.29
Degrees of freedom	3
Statistical significance of the model (p-value)	< .001
-2 Log Likelihood	417.80
Nagelkerke's adjusted R ²	.09

Individual predictors

<u>Independent variables</u>	<u>B</u>	<u>SEB</u>	<u>Odds Ratio</u>	<u>Wald Statistic</u>	<u>p</u>
Agreeableness	-.05	.02	.95	11.76	< .005
Conscientiousness	-.05	.02	.96	5.51	< .05
Prevention program	.87	.27	2.38	10.48	< .005

Note: N = 709

long-term (W5)

Model chi-square	5.73
Degrees of freedom	1
Statistical significance of the model (p-value)	< .05
-2 Log Likelihood	380.89
Nagelkerke's adjusted R ²	.02

Individual predictor

<u>Independent variable</u>	<u>B</u>	<u>SEB</u>	<u>Odds Ratio</u>	<u>Wald Statistic</u>	<u>p</u>
Emotional Stability	-.04	.02	.96	5.76	< .05

Note: N = 515

Table 23. Classification tables: The predictive role of personality in future intention to smoke – short-term gender specific results.

Girls – short-term (W4)

		Predicted Smoking		Corrected percentages
		1	2	
Observed	1	333	0	100
Smoking	2	30	1	3,2
		363	1	91,8

Note: 1 = surely don't, rather don't; 2 = rather do, surely do

Boys – short-term (W4)

		Predicted Smoking		Corrected Percentages
		1	2	
Observed	1	304	0	100
Smoking	2	37	0	0
		341	0	89,1

Note: 1 = surely don't, rather don't; 2 = rather do, surely do

Table 24. The predictive role of personality in intention to smoke – gender specific results.

Girls - short-term (W4)

Model chi-square	15.37
Degrees of freedom	2
Statistical significance of the model (p-value)	< .001
-2 Log Likelihood	196.62
Nagelkerke's adjusted R ²	.09

Individual predictors

<u>Independent variables</u>	<u>B</u>	<u>SEB</u>	<u>Odds Ratio</u>	<u>Wald Statistic</u>	<u>p</u>
Agreeableness	-.06	.02	.94	6.69	< .05
Prevention program	1.18	.42	3.24	8.04	< .05

Note: N = 364

Boys - short-term (W4)

Model chi-square	6.56
Degrees of freedom	1
Statistical significance of the model (p-value)	< .05
-2 Log Likelihood	227.62
Nagelkerke's adjusted R ²	.04

Individual predictor

<u>Independent variable</u>	<u>B</u>	<u>SEB</u>	<u>Odds Ratio</u>	<u>Wald Statistic</u>	<u>p</u>
Agreeableness	-.05	.02	.95	6.53	< .05

Note: N = 341

As represented in Table 24, in separate gender groups for the short-term prediction (W4) from the personality relevant predictors, only Agreeableness proved to play a significant role for both girls ($\chi^2 = 6.69$; $p < .001$; Wald statistic = 6.69; $p < .05$) and boys ($\chi^2 = 6.56$; $p < .05$; Wald statistic = 6.53; $p < .05$). There was a lower probability for agreeable boys and girls to change their negative attitude toward smoking, but the classification tables did not show a satisfying categorization (Table 23). Moreover, it seems that, also here, girls acted curiously again because a short-term negative effect of the prevention program showed up in the gender specific results (Wald statistic = 8.04; $p < .05$). The long-term prediction effect of Emotional Stability as found in the total group could not be replicated in the gender specific results.

3.4.8 Discussion

In regard to smoking, in the group of 12-16 year old adolescents, no positive prediction effects due to the social-skills oriented prevention program could be observed. However, a significant effect for the personality dimensions of the onset of smoking and on the change in the attitude toward smoking was found. Such an early detection of potential risk factors makes support possible before the developmental process becomes disturbed. Problem detection, age and risk group specific intervention can prevent the onset of habitual legal drug consumption and, therefore, facilitate the emergence of a stable and firm resistance against the abusive consumption behavior of legal drugs. This study provided support to the predictive role of two personality dimensions both in current smoking and in future intention to smoke, namely Agreeableness and Conscientiousness, and the study showed the problematic role of Extraversion. Extraverted adolescents, specifically female adolescents, more frequently tended to trial behavior when addiction and consumption of legal drugs became a topic in class.

In this respect, Hesse (1993) also found a stronger trial behavior in her study with over 100 adolescents and explained it by an enhanced curiosity toward tobacco. It is important to note here that trying health-endangering substances, especially in the case of tobacco or

alcohol, is not only considered as an unsatisfying coping mechanism, but also as experimenting with their own boundaries or limits. That, in return, can trigger, longitudinally considered, a more stable resistance against substance abuse. The findings supported this interpretation: in the results the self-reported trial behavior appeared predominantly in the group of extraverted girls. Girls reacted more sensitive to the intervention program and to thematization of legal drug consumption, as Leppin, Freitag, Pieper, Szirmák and Hurrelmann (1998) already showed with the alcohol specific results of this study.

In contrast to the unfavorable results found for the group of girls, Walden (2000) found significantly preventive effects for a prevention program for girls. She assumed, that girls demonstrate self-assurance through smoking, and when alternative self-assured behavior patterns are provided, girls loose interest in smoking. Shiner (2000) reported a relationship in early adolescence between Agreeableness, social competence and rule abiding. This result can be related to the present findings, showing that adolescents low on Agreeableness also disobey adult regulations through engaging in smoking. The results also correspond to the argumentation by Walden (2000) that a shortage on social competences that goes together with low Agreeableness is compensated through substance use in adolescence. In the present study, long-term predictions could be obtained for future intention to smoke with Emotional Stability as a personality predictor. For current smoking, only the gender specific long-term prediction model for boys became significant and Agreeableness showed a statistically significant prediction effect. However, as the classifications failed to predict correct group memberships for those who changed their intention or consumption status in all cases, the results must be interpreted with caution.

Altogether, the great majority of adolescents at the age of 11-13 years are to be characterized as non-consumers or occasional consumers. A meaningful change in the consumption pattern occurs around age 15 and the proportion of habitual or regular consumers grows to as much as one third of the adolescents (Klocke, 1994; Kolip, 1995b).

It is to be concluded, that the present substance specific legal drug prevention program in the lower secondary school grades should not necessarily be considered ineffective. The low prevalence for smokers and the great majority of non-smokers - according to the longitudinal frequencies and results - showed that the final questioning took place before a massive change in the attitude toward smoking occurred. The preventive processes that are aimed to be triggered here need time and opportunity to unfold their longitudinal effect. Behavioral changes appear more slowly than changes in knowledge and can be detected only when the influenced behavior becomes highly relevant in the developmental process. In regard to the personality characteristics, we may conclude that the study provided useful and distinctive information for the developmental personality research and proved the relevance of the Big Five model in school oriented health promotion and drug prevention.

In summary, the role of Conscientiousness and Agreeableness proved to be decisive in the development of addiction and legal drug consumption and Emotional Stability showed a weak but significant effect in the long-term prediction of the intention to smoke. Attention should be paid to the temporary negative effects of the prevention program that appeared in some of the analyses and could be traced back, especially to the group of girls. Therefore it is advised to develop prevention programs that are more personality and gender specific and tailor the programs more to the needs and characteristics of adolescents instead of aiming to reach all participants without concerning their individuality in the future.