

# Impulsivity of Adolescents and Parenting Styles in the Context of Experimentation with Smoking

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**Abstrakt** The study examines tobacco-related behaviour in families in the context of experimentation with smoking, the implementation of parenting styles and the impulsivity of adolescents in the context of tobacco abuse. The study group consisted of a total of N (548) adolescents, including N (males) = 247, N (females) = 301, mean age of the adolescents: AM = 16.3. The study employs questionnaire methods, specifically a demographic questionnaire (initiation of smoking, tobacco-related behaviour); a questionnaire into situational-motivational factors of smoking – an additional scale of tobacco-related behaviour in the family (Rojková, Gálová, 2015); the IVE questionnaire of impulsivity (Eysenck & Eysenck, 1985); and a questionnaire related to parental authority – a survey of parenting styles (Buri, 1991). The most significant findings: in the case of authoritative parenting, the rate of experimentation with smoking is at its lowest, and it rises with as the impulsivity of adolescents increases. The tobacco-related behaviour of parents represents a significant predictor of experimentation with smoking in adolescence.

**Keywords** experimentation, impulsivity, parenting styles, smoking

## 1. THE CHARACTERISTICS OF THE PROBLEM

Smoking is a society-wide issue and is considered a significant predictor of health problems and disease; yet studies report an increased rate of experimenting with smoking and a lower age limit of smokers. The research conducted confirms both an increased rate of experimentation and a decrease of the lower age limit of the initial contact with smoking (Jurkovičová, 2005). The rise in experimentation with smoking is supported by greater societal tolerance, non-compliance with existing legislation and the underestimation of the negative effects on the human body. The relationship to smoking is built up through physical, psychological, and social events, and results in learned behaviour (Klimáková, 2012). Tobacco-related behaviour is fostered by occasions, recurrent situational impulses, and experimentation with tobacco products (Bieliková et. al. 2003). As to the first experience with smoking, initial opportunities to smoke are reported as early as in childhood, and if experimentation starts in adolescence, it triggers addictive behaviour in terms of nicotine addiction, which forms progressively and the adolescent tends to underestimate or deny the consequences of smoking (Baška, 2008; Ellickson, et. al., 2001; Heretík, et.al. 2008; Kimáková, et.al.,

2013). Dependence is not an outcome of rational thinking, it arises spontaneously. Triggers for experimentation and tobacco-related behaviour may lay in genetic dispositions – irritability, impulsivity, lesser inhibitions, sensation seeking etc. (Whiteside, Lynam, 2001). Impulsivity as a personality construct has been shown to rise in adolescence and tends to decline over time (Steinberg, 2008). Impulsivity is associated with a plausible risk of maintaining a dependence on tobacco products (Mathew, et al., 2015; Jančovičová, et al. 2004). According to Bloom et al. (2014) high levels of impulsivity are linked to enhanced sensitivity to nicotine during the initial stage of experimentation. A study by Bold et. al. (2017) reported that a higher impulsivity score among adolescents is linked to a lower age for the initiation and start of smoking electronic cigarettes. Kvaavik and Rise (2012) consider impulsivity as a major predictor in terms of initiation into smoking. Impulsivity plays a major role in the behaviour of adolescents (Démuthová, 2016, Démuthová, Bucik, 2013). The tendency to take risks and make impulsive decisions might be seen as a crucial personality construct (Zuckerman, Cloninger, 1996; Gregorová, 1998), a biologically dependent personality trait (Čerešník, et al. 2018). Predictors of dependence on smoking are also found in socially determined factors. Parental examples play a significant role in experimentation (Rojková, 2016; Rojková, Vavrová, 2017, 2020; Wang, et. al. 2015; Ondrušková, et. al., 2016). The probability that children will start smoking and develop a dependence on smoking is affected by whether their parents and siblings also smoke. A study by Exter et.al. (2007) interprets tobacco-related behaviour in the family as a method of modelling risky behaviours in adolescence. According to Mays et. al. (2014), experimentation with smoking in the context of the family environment tends to occur more frequently in families where parents smoke. In this regard, De Adrabe et. al. (2017) discovered that both parents are predictors for the increased prevalence of tobacco-related behaviour. Leonard- Bee et. al. (2011) claims that the risk of smoking among adolescents rises even if only one parent is a smoker. Adolescents perceive smoking as a means of establishing contacts, a way to relieve tension during social occasions. It is especially younger adolescents and individuals with an inclination towards depression and anxiety that succumb to peer pressure, which adolescents are subjected to in their social contacts (Heretík, a kol. 2008; Ellickson a kol. 2001; Baška, 2008). Personality predictors of experimentation and tobacco-related behaviour include resilience, impulsiveness (Vavrová, Gálová, 2017), anxiety, frustration tolerance, conscientiousness, self-efficacy, adventurousness (Dolejš, Skopal,

2014). Other major predictors include parenting styles and parental authority. Research (e. g. Manniová, 2007; Huwer, et. al., 2007; Wang et.al., 2015) that has dealt with the link between parenting styles and smoking demonstrates a higher probability of the initiation of smoking and regular smoking in adolescents who experience emotional problems in the family and are not accepted by their parents. Parenting styles, such as authoritative and authoritarian, lower the probability of the abuse of tobacco products and represent a certain protective factor against experimentation and general smoking behaviour among adolescents (Huwer, et.al. 2007; Courtois et. al., 2007, Wang et. al., 2015). The results of a study by Bronte-Tinkew, et. al. (2006) demonstrated the significance of a father with an authoritative parenting style in the elimination of the risk of experimenting with smoking.

### 1.1 The Aim of the Research

To identify links between experimentation with smoking during adolescence and parenting styles. To analyse the tobacco-related behaviour of parents with regard to experimentation with smoking among adolescents and to reveal any correlation between impulsivity and experimentation with smoking. Another goal is to determine the strength of predictors (parenting styles, impulsivity) and measure the risk factors for smoking dependence.

### Hypothesis

H1 Adolescents who experiment with smoking exhibit a higher rate of impulsivity than compared to adolescents who do not

H2 An authoritative parenting style increases the prevalence of experimentation with smoking.

H3 The frequency of experimentation with smoking is higher in families where parents smoke compared to families with no tobacco-related behaviour.

H4 If both parents are smokers, the prevalence of experimentation with smoking is higher.

### Research Questions

RQ1 Which of the predictors (impulsivity, parenting styles) has a greater impact as a predictor of experimentation with smoking?

RQ2 What is the link between impulsivity and the age of adolescents at the time when they experiment with smoking?

RQ3 Do adolescents start to experiment earlier if their parents are smokers?

### Study Sample

The study sample was made up of adolescents aged 15 to 19 studying at secondary schools in different regions of Slovakia. The study group was formed by selection from this group, the only criterion being the age of adolescents. The study group consisted of N = 548 adolescents (247 boys and 301 girls), mean age 16.3.

### Research Methods

The primary data about age and experimentation with smoking was obtained through the questionnaire on situational-motivational factors of smoking (Rojková, Gálová, 2015). The questionnaire was a modification of the questionnaire used in the situational motivational factors (SMF) of alcohol behaviour survey (Rojková, Vavrová, 2017). In the study, the questionnaire part on SMF of experimentation and an additional scale on tobacco behaviour within the family was used. The part on SMF of experimentation was

comprised of 20 items and an additional scale of 3 items. The responses were recorded on a 5-degree Likert scale (completely agree – agree – cannot tell – disagree – completely disagree). The standardised IVE questionnaire – impulsivity scale (Eysenck & Eysenck, 1985) was employed in order to determine impulsivity. Comprising 54 items, the questionnaire contains dichotomous answers. The reliability of the questionnaire method was verified by an analysis of the internal consistency, giving a Cronbach's alpha value of 0.77–0.90. The main point of focus was the number of points scored by respondent for impulsivity. The impulsivity scale was formed by 19 items. The parental authority questionnaire (Buri, 1991) was applied in order to identify the parenting style of the family (authoritative, authoritarian or permissive), of each individual parent. The questionnaire is composed of 30 statements and aims to analyse the subjective perception of the parenting style – the responses were recorded on a 5-degree Likert scale (completely agree – agree – cannot tell – disagree – completely disagree). The questionnaire data is valid, Cronbach's alpha was 0.74–0.87. The psychometric parameters of the questionnaire allow it to be approved for use for study purposes. The data gathered was entered into a database in the SPSS software.

### The Results and Interpretation

To identify links between experimentation with smoking during adolescence and the presence of different parenting styles. To analyse the tobacco-related behaviour of parents with regard to experimentation with smoking among adolescents and to reveal the connection between impulsivity and experimentation with smoking. Another goal is to determine the strength of predictors (parenting styles, impulsivity) and measure the risk factors for smoking dependence.

Table 1. Mann-Whitney U test: Differences in impulsivity between adolescents who experiment with smoking and those who do not.

		N	Mean order	Mann-Whitney U test	
Impulsivity	NE	153	198.06	U	18.522
	E	345	272.31	Z	-5.328
	Σ	498		Sig.	0.000

Legend: NE (no experimentation), E (experimentation)

In Table 1, the H1 hypothesis was tested using the Mann-Whitney U test, which compared the distribution of the variable of impulsivity between respondents who experimented with smoking and those who did not. The test result was  $U = 18.522$ ;  $Z = -5.328$ ;  $\text{Sig.} < 0.001$ . The result indicates the statistical significance of the differences between the groups in terms of the impulsivity score. Based on the mean order, higher values of impulsivity occurred in respondents who experimented with smoking ( $MR = 272.31$ ) compared to respondents who did not experiment with smoking ( $MR = 198.06$ ). We approve the H1 hypothesis. A Chi-square test was used to verify the H2 hypothesis, and differences between parenting styles were investigated between the groups of adolescents who experimented or did not experiment with smoking. The result of the test used was  $\chi^2 = 0.423$ ;  $\text{sig.} > 0.05$ . There were no statistically significant differences in smoking experimentation among the respondents between the different parenting styles. The H2 hypothesis is rejected. These results are shown in Table 2. Differences between the parenting style of the mother and experimentation with smoking among respondents were also examined using a Chi-square test; the results were not statistically significant ( $\chi^2 = 2.402$ ;  $\text{Sig.} > 0.05$ ) (Table 2a). There are no significant differences between the parenting styles of the mother and the extent of experimentation with smoking by adolescents. The H2a hypothesis is rejected. A Chi-square test was also used to

identify the differences between the group of respondents who experimented with smoking and the group that did not and the parenting style of their father. The test showed statistically significant differences ( $\chi^2 = 6.767$ ; sig. < 0.05) (Table 2b) in cross-table cell counts. Experimentation with smoking occurred in 28.60% of respondents who were brought up by a father with permissive and authoritarian parenting style. 42.80% of respondents brought up by a father with an authoritative parenting style also experimented with smoking. In contrast, 53.90% of respondents raised by a father with an authoritative parenting style, 27.70% with a father with an authoritarian parenting style and 18.40% of respondents raised by a father with a permissive parenting style did not experiment with smoking. Individuals who were brought up by a father with an authoritative parenting style less frequently experimented with smoking compared to individuals brought up by fathers with other parenting styles. This link between experimentation and a mother with an authoritative style was not found; therefore, we reject the H2 hypothesis.

Table 2. Cross table of the Chi-square test (for both parents)

		Parenting style			Σ
		P	Au	A	
no experimentation	N	29	23	60	112
	EN	26.86	24.72	60.43	112.00
	%	26%	21%	53%	100%
experimentation	N	59	58	138	255
	EN	61.14	56.28	137.57	255.00
	%	23%	23%	54%	100%
Σ	N	88	81	198	367
	EN	88.00	81	198.00	367.00
	%	24%	22%	54%	100%
		Value		df	Sig.
Chi-square		0.423		2	0.809

Legend: P(permissive), AU (authoritarian), A (authoritative)

Table 2a. Cross Table – Chi-square test (mother's parenting style)

		Parenting style			Σ
		P	AU	A	
no experimentation	N	40	31	77	148
	EN	33.8	35.2	79	148
	%	27.00%	20.90%	52.00%	100%
experimentation	N	77	91	197	365
	EN	83.2	86.8	195	365
	%	21.10%	24.90%	54.00%	100%
Σ	N	117	122	274	513
	EN	117	122	274	513
	%	22.80%	23.80%	53.40%	100%
		Value		df	Sig.
Chi-square		2.402		1	0.301

Legend: NE (no experimentation), E (experimentation), P(permissive), AU (authoritarian), A (authoritative), EN (estimated number)

Table 2b. Cross Table – Chi-square Test (father's parenting style)

		Parenting styles			Σ
		P	AU	A	
no experimentation	N	26	39	76	141
	EN	36.2	40	64.9	141
	%	18.40%	27.70%	53.90%	100 %
experimentation	N	99	99	148	346
	EN	88.8	98	159.1	346
	%	28.60%	28.60%	42.80%	100%
Σ	N	125	138	224	487
	EN	125	138	224	487
	%	25.70%	28.30%	46.00%	100 %
		Value		df	Sig.
Chi-square		6.767		1	0.034

Legend: P (permissive), AU (authoritarian), A (authoritative), EN (estimated number)

Table 3. Results of the binary logistic regression analysis with a dependent variable

	Chi-square		df		Sig.	
	28.392		4		0.000	
	-2 Log Est.		Cox & Snell R <sup>2</sup>		Nagelkerke R <sup>2</sup>	
	446,839 <sup>a</sup>		0.071		0.100	
	B	S.E.	Wald	Df	Sig.	Exp(B)
Impulsivity	0.117	0.031	14.263	1	0.000	1.124
Smoking in the family (1)	0.654	0.230	8.104	1	0.004	1.923
Authoritative parenting style of the father	-0.016	0.014	1.375	1	0.241	0.984
Constant	-0.107	0.605	0.032	1	0.859	0.898

In Table 3, the model was tested through a logistic regression analysis and proven to be valid ( $\chi^2 = 28.392$ ; Sig. < 0.001). This model with the predictors of impulsivity, smoking parents and the authoritative parenting style of the father accounts for the 7.1 – 10% aetiology of experimentation with smoking among adolescents. The above predictors failed to prove that the authoritative parenting style of the father is statistically significant (Sig. > 0.05). The strongest predictor was impulsivity (Sig. < 0.001). When the impulsivity score of a respondent increases by 1 point, the risk of them experimenting is 1.124 times higher. Smoking in the family was also a statistically significant predictor (sig. < 0.01); if the family of an adolescent smokes, their likelihood of experimentation with smoking is 1.923 times higher than that of an adolescent whose family members do not smoke. RQ1: Impulsivity was the strongest predictor (Sig. < 0.001). When the impulsivity of a respondent increases by 1 point, their risk of experimentation is 1.124 times higher. Smoking in the family was also a statistically significant predictor (sig. < 0.01); if the family of an adolescent smokes, the likelihood of experimentation with smoking is 1.923 times higher than that of an adolescent whose family members do not smoke. RQ1: Impulsivity was the strongest predictor (Sig. < 0.001).

Table 4. Prevalence of parents who smoke in the group of adolescents that experiment and the group that does not

	M	N	%	F	N	%
No experimentation	1	102	62.20	1	93	56.70
	2	53	32.30	2	60	36.60

Experimentation	1	232	60.60	1	181	47.30
	2	143	37.30	2	194	50.70

Legend: M (mother), F (father), 1 non-smoker, both smoke

Table 4 shows the extent of experimentation with smoking among adolescents based on the tobacco-related behaviour of their parents. The group of non-experimenting adolescents whose mother did not smoke made up 62.20% of our sample. 60.60% of our adolescents who experimented with smoking had a non-smoking mother and 37.30% of those who experimented with smoking grew up in a family where the mother smoked during their adolescence. 56.70% of respondents have not experimented with smoking and had a non-smoking father, while 36.30% of those who have not experimented with smoking had a father who was a smoker during their adolescence. Adolescents whose father smoked accounted for 50.70% of the group of respondents who had experimented with smoking, and respondents whose father does not smoke accounted for 47.30% of those who have experimented and for 2.10% of adolescents the data on the smoking habits of the father was missing.

Table 5. Spearman's coefficient of ordinal correlation: The link between the age of experimenting and impulsivity

		Impulsivity
Age	Spearman's rho	-0.129
	Sig.	0.074
	N	194

Table 5: The result of the coefficient of ordinal correlation was  $\rho = -0.129$ ; sig. > 0.05. No correlation was found between the age of experimentation with smoking by adolescents and the impulsivity of the respondents. RQ2: No statistically significant link was found between the age of adolescents when they experiment with smoking and their impulsivity.

Table 6. Mann-Whitney test: Difference in the age of experimentation with smoking based on the tobacco-related behaviour of parents

		N	Mean order	Mann-Whitney test	
1	2	74	115.14	U	4022.5
	3	132	96.97	P	-2.127
	$\Sigma$	206		Sig.	0.033

Legend: 1 (age of experimentation), 2 (non-smoking parents), 3 (smoking parents)

Table 6: A higher age of experimentation with smoking was found in respondents from non-smoking families (MR = 115.14) and respondents who experimented with smoking at a younger age were associated with smoking in the family during their adolescence (MR = 96.97). RQ3: The age of experimentation with smoking in adolescents decreases with the presence of tobacco-related behaviour in parents.

Table 7. Cross table: Chi-square test: Comparison of the frequency of experimentation with smoking based on the tobacco-related behaviour of parents

		Parents		
		Non-smoking	Smoking	$\Sigma$
No experimentation	N	75	78	153
	Est. number	61.1	91.9	153

	%	49.00%	51.00%	100.00%
Experimentation	N	136	239	375
	Est. number	149.9	225.1	375
	%	36.30%	63.70%	100%
$\Sigma$	N	211	317	528
	Est. number	211	317	528
	%	40.00%	60.00%	100%
Chi-square		Value		7.366

Table 7 shows the difference between the categories of smoking and non-smoking in the families of adolescents. The chi-square test discovered a statistically significant difference between the groups of adolescents with smokers or non-smokers in the family ( $\chi^2 = 7.366$ ; Sig. < 0.05). The differences indicated in the cross table are interpreted as statistically significant. Experimentation with smoking occurred in 63.70% of respondents who had smokers in their families and in 36.30% of those whose family members were non-smokers. 49% of respondents from non-smoking families and 51% of individuals with smokers in their families have not experimented with smoking. Respondents whose family members smoked during their adolescence experimented with smoking more frequently than those whose family members did not smoke. We accept hypothesis 3.

Table 8a Cross table: Chi-square test: Comparison of the frequency of experimentation with smoking based on the tobacco-related behaviour of the mother

		Smoking mother		
		Non-smoker	Smoker	$\Sigma$
No experimentation	N	102	53	155
	Est. number	97.7	57.3	155
	%	65.80%	34.20%	100%
Experimentation	N	232	143	375
	Est. number	236.3	138.7	375
	%	61.90%	38.10%	100%
$\Sigma$	N	334	196	530
	Est. number	334	196	530
	%	63.00%	37.00%	100%
Chi-square		Value		0.730

Table 8a shows the frequency of experimentation with smoking in adolescence based on the tobacco-related behaviour of the mother. A chi square test ( $\chi^2 = 0.730$ ; sig. > 0.05) revealed that there are no significant differences in the frequency of experimentation with smoking in adolescents related to whether their mother is a smoker. Table 8b displays the result of the chi square test  $\chi^2 = 6.821$ ; sig. < 0.05 in the context of an analysis of the link between smoking experimentation and whether the father is a smoker. Experimentation with smoking occurred in 51.70% of adolescents whose father smoked and 48.30% of those whose father did not smoke. As to those who did not experiment with smoking, 60.80% of them were raised by a non-smoking father and 39.20% by a smoking father (tabl 8b). Our interpretation is that the prevalence of experimentation with smoking is lower in families where the father is a non-smoker. Considering that the link between experimentation with smoking in adolescence and a smoking mother was not confirmed, we reject the H4 hypothesis.

Table 8b. Cross table. Chi-square test – Comparison of the frequency of experimentation with smoking based on the tobacco-related behaviour of the individual's father

		Smoking father		
		Non-smoker	Smoker	Σ
No experimentation	N	93	60	153
	Est. number	79.4	73.6	153
	%	60.80%	39.20%	100%
Experimentation	N	181	194	375
	Est. number	194.6	180.4	375
	%	48.30%	51.70%	100%
Σ	N	274	254	530
	Est. number	274	254	530
	%	51.90%	48.10%	100%
Chi-square		Value		6.821

## 2. DISCUSSION

The results of the presented study indicate a link between impulsivity and experimentation with smoking in adolescence. Our findings are supported by the research of Kvaavik, Rise (2012), Granö et al., 2004, Mitchell, 2004). According to Reynolds and Fields (2012), young people who experiment with cigarettes may resemble those who smoke regularly with regard to their tendency to postpone future rewards and exhibit impulsive tendencies more frequently than individuals who do not experiment with smoking. Settles, et al. (2010) suggest that impulsivity, after an initial experience with a cigarette, may be a source of reinforcement of the positive effects of cigarette use, which may increase the probability of experimentation. Leventhal and Schmitz, (2006) highlight the probability of the formation of dependence in the context of adult role-models. The consequences of this role-model can be seen by adolescents in the media or in their lives. Experimentation with smoking in adolescence and its dependence on the father's parenting style yielded significant findings. Adolescents who were brought up by a father with an authoritative parenting style less frequently experimented with smoking compared to individuals raised in an authoritarian or permissive parenting style. These results are consistent with the findings of Bronte-Tinkew, et al. 2006. Control and support from the father, which are specific parts of an authoritative parenting style, constitute an important strategy against substance abuse in adolescents (Li, et al. 2000). The results of our research showed statistically significant differences between experimentation with smoking in adolescents and smoking among family members. Adolescents whose family members smoke more frequently experimented with smoking than those whose family members have never smoked. The results are in line with a study by Leonardi-Bee et al. (2011). Smoking in the family can serve as an important indicator of the likelihood of trying tobacco products in adolescence (Hill, et al., 2005). Family influence is important not only in the context of experimenting with smoking, but it may also influence the other stages of smoking, such as daily smoking (Mayhew, et al. Al., 2000). Further findings of this study highlighted the importance of parents as role models for adolescent behaviour. It was discovered that parental experimentation brings the aspect of earlier experimentation and initiation of smoking. Experimentation with smoking at a young age predicts future smoking patterns, including daily smoking, smoking intensity, nicotine dependence, and difficulty in quitting (Hu, Davies, Kandel, 2006; Wilkinson, et al. Al., 2007). Experimentation with smoking is encouraged by the presence of smoking in the family, specifically a smoking father. The above mentioned findings are confirmed by Leonardi-Bee et al. (2011), according to whom the presence of

smoking in at least one parent is a predictor for the adoption of tobacco-related behaviour in adolescents. In the above-mentioned study, it was confirmed that the father is a significant predictor for the formation of smoking dependence. These findings are further confirmed by De Andrade et al. (2017).

## 3. CONCLUSION

Experimentation with smoking during adolescence occurs in families regardless of the presence or absence of smoking in the family. However, the prevalence of smoking in the families of adolescents is a predictor of earlier experimentation with smoking. As concerns parents, a significant determinant for the formation of tobacco-related behaviour is smoking by the father of adolescents. Impulsivity in adolescents also increases the rate of experimentation with smoking.

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