

## Chapter #15

### SERIAL MEDIATION MODELS TESTING THE EFFECT OF A SCHOOL-BASED PREVENTION PROGRAM ON SMOKING AND ALCOHOL CONSUMPTION

Oľga Orosová, Beáta Gajdošová, & Jozef Benka

*Department of Educational Psychology and Health Psychology, Faculty of Arts, Pavol Jozef Šafárik University in Košice, The Slovak Republic*

#### ABSTRACT

The aim of this study was to investigate the in/direct effect of the Unplugged program on smoking (S) and alcohol consumption (AC) in schoolchildren one year after the implementation of Unplugged within a Solomon four group design. A randomized control trial using the Unplugged program was carried out among schoolchildren (13.5 years, SD = 0.59; 47.5% girls, 1420 schoolchildren in total). The data collection was carried out immediately before implementing the program (T1, experimental and control group with a pre-test), immediately after implementing the program (T2), and a year after program implementation (T3). The direct effect of Unplugged on AC<sup>T3</sup> was confirmed and this effect was moderated by the pre-test. However, such effect on S<sup>T3</sup> was not found. The effect of Unplugged on AC<sup>T3</sup> was serially mediated by meaningful participation in community (ComPart)<sup>T3</sup> and satisfaction with oneself<sup>T3</sup>. Only one shortcut mediation effect of Unplugged on S<sup>T3</sup> through ComPart<sup>T3</sup> was confirmed. Teachers and school psychologists can promote schoolchildren's 'health-related behavior by encouraging them to do activities that are not limited to the school domain which allows them to experience success, belonging, developing satisfaction with oneself through the successful implementation of the Unplugged program.

*Keywords:* unplugged, smoking, alcohol consumption, meaningful participation in the community, satisfaction with oneself, schoolchildren.

#### 1. INTRODUCTION

Risk-related behaviour such as smoking and alcohol consumption are health problems that can negatively affect the life perspective of young people. The ESPAD Group (2020) reported that cigarettes are one of the most easily accessible drugs in Slovakia with over 70 % of pupils reporting access to be easy. The findings of previous research have confirmed that the perceived availability of cigarettes is the strongest predictor of smoking. Indeed, it was found that the schoolchildren reporting a higher level of perceived availability of cigarettes were about two times more likely to smoke (Orosová, Gajdošová, Bačíková-Šlěšková, Benka, & Bavoľár, 2019). The ESPAD group also found that "2.9 % of the pupils began smoking cigarettes on a daily basis at age 13 or younger" and that "the rates were highest in Slovakia (6.0 %) and Bulgaria (5.8 %)" (ESPAD Group, 2020, p.13). The results of this national study suggested that the 30-day prevalence of smoking that was reported by schoolchildren (M = 11.52 years) had risen from 3.0% to 8.2% over 22 months.

In terms of alcohol consumption, the ESPAD Group (2020) reported that 33% of the pupils who participated in the ESPAD study had first tried an alcoholic drink age 13 or younger and that alcohol was perceived to be easily available. In most countries, the rates

of availability of alcohol among boys and girls were found to be similar. A previous study has confirmed that the strongest predictors of reporting alcohol consumption among Slovak schoolchildren are descriptive normative beliefs and the availability of alcohol (Orosová, Gajdošová, Bačíková-Šléšková, Benka, & Bavoľár, 2020). Schoolchildren with a higher level of descriptive normative belief change and availability of alcohol were twice as likely to report alcohol consumption at the follow-ups (at four follow-ups over the 22 months). Slovakia reported an increase in current alcohol use of five or more percentage points between 2015 and 2019 (ESPAD Group, 2020).

Interventions directed at schoolchildren are essential in preventing drug use initiation, delaying the age of first use and reducing the rates of drug use (Miller & Hendrie, 2009). The European Monitoring Centre for Drugs and Drug Addiction (2019) introduced Unplugged as an effective school-based prevention program designed to reduce substance use in adolescents aged 11-14 across different contexts. The Unplugged program is based on the comprehensive social influence approach and life skills training components. It is designed to delay or prevent the onset of substance misuse among schoolchildren (Faggiano et al., 2010, Kreeft et al., 2009). The Unplugged program incorporates components focused on critical thinking, decision-making, problem-solving, creative thinking, effective communication, interpersonal relationship skills, self-awareness, empathy, coping with emotions and stress, normative beliefs and knowledge about the harmful health effects of substances (European Monitoring Centre for Drugs and Drug Addiction, 2019, Caria, Faggiano, Bellocco, Galanti, & EU-Dap Study Group, 2011). The experimental evaluation of the effectiveness of the Unplugged program indicated positive effects over 18 months for alcohol abuse and for cannabis use, but not for cigarette smoking among pupils in seven European countries (Austria, Belgium, Germany, Greece, Italy, Spain, and Sweden) which participated in the study (Faggiano et al., 2010). However, in other EU countries such as Czechia, it was found that the Unplugged produced positive effects on reducing current tobacco and marijuana use among adolescents (Gabrhelik et al. 2012). A systematic review of School-Based Alcohol and other Drug Prevention Programs confirmed that Unplugged has the best evidence of effectiveness in European studies (Agabio et al., 2015).

The current study was focused on the direct and indirect effect of this EU-Dap Unplugged program (Vigna-Taglianti et al., 2014) on smoking and alcohol consumption among Slovak schoolchildren. The research design of the present study was based on previous findings suggesting that participation in meaningful instrumental activities (individual perceptions of participating in psychologically and personally significant activities that are not limited to the school domain) were associated with adolescents' life satisfaction and perceived quality of life (Proctor & Linley, 2014, Huebner et al., 2004). Indeed, they have been identified as one of the important protective factors of substance use (Hodder et al., 2018, Zimmerman & Maton, 1992) and could support positive adolescent empowerment and self-esteem (Chinman & Linney, 1998). Some person-based, environment-focused and activity-related elements such as having fun, experiencing success, belonging, experiencing freedom, developing an identity, authentic friendships, the opportunity to participate, role models enhancing meaningful participation (Willis et al., 2017). The current study focused on the issue whether implementing Unplugged could enhance meaningful community participation, satisfaction with oneself, and risk-related behavior of schoolchildren.

Firstly, it was hypothesized that there would be a direct effect of Unplugged on schoolchildren's smoking and alcohol consumption one year after program implementation. It was expected that a lower percentage of schoolchildren from the experimental group, who had taken part in Unplugged, would report smoking and alcohol consumption in comparison

with the schoolchildren from the control group who had not. Secondly, it was hypothesized that there would be a direct effect of Unplugged on schoolchildren's meaningful participation in the community (ComPart), as part of a serial mediation. It was assumed that Unplugged would have a favourable effect outside the home on school group activities, sports and artistic activities and on their willingness to help other people. There has been evidence to suggest the importance of meaningful free-time substance-free activities in drug use prevention that can contribute to the development of new skills, fostering of self-esteem, a sense of meaning, social connectedness, mental well-being and resilience (Santini et al., 2020). Thirdly, it was hypothesized in this recent study that there would be a direct effect of schoolchildren's participation in the community on satisfaction with oneself as well as a direct effect of satisfaction with oneself on their smoking and alcohol consumption. In order to further clarify the effect of Unplugged, the present study tested a serial mediation model by proposing a theoretically based hypothetical causal chain.

## **2. DESIGN**

This study was a randomized control trial using a Solomon four-group design which enabled testing for the presence of pre-test sensitization (Nakazwe & Chanda, 2018, Braver & Braver, 1988).

## **3. OBJECTIVE**

The aims were to: 1) test whether the Unplugged program affects smoking and alcohol consumption as reported by schoolchildren a year after program implementation within a Solomon four group design, controlling for smoking or alcohol consumption as reported by schoolchildren immediately after program implementation, the pre-test, and gender; and 2) investigate whether the Unplugged program may affect smoking and alcohol consumption as reported by schoolchildren a year after program implementation through two mediating mechanisms: Meaningful participation in the community (ComPart) and Satisfaction with oneself. In addition, the hypotheses were tested as serial mediations in which Unplugged would affect Meaningful participation in the community, which would then be associated with Satisfaction with oneself. This would finally lead to a lower percentage of schoolchildren in the experimental group who would report smoking and alcohol consumption a year after program implementation.

## **4. METHODS**

### **4.1. Sample and Procedure**

A randomized control trial using the Unplugged program was carried out among schoolchildren at 24 primary schools. The sampling used a list of primary and secondary schools in Slovakia retrieved from the Institute of Information and Prognosis of Education. The schools were selected from different municipalities on the basis of their geographical locations in East, Central and West Slovakia with six clusters based on population size.

Twelve schools were assigned to the experimental group ( $n = 798$ ) while twelve schools were assigned to the control group ( $n = 622$ ). The sample consisted of 1420 schoolchildren in total. The mean age of the schoolchildren was 13.5 years,  $SD = 0.59$ ; 47.5% girls. In this design, both the experimental and control groups had two subgroups: a

pretested group and an non-pretested group. The number of schoolchildren in the pretested experimental group was 397 while the number of schoolchildren in the non-pretested experimental group was 401. The number of schoolchildren in the pretested control group was 333 and the number of schoolchildren in the non-pretested control group was 289.

The data collection was carried out immediately before implementing the program (T1, experimental and control group with a pre-test), immediately after implementing the program (T2) and a year after program implementation (T3).

The data collection was carried out with the informed consent of parents/guardians. The questionnaires were filled in during one lesson in the presence of a trained research team member, without a teacher being there. All the data that was collected was anonymized.

The protocol of this study was reviewed and approved by the Ethics Committee at the Faculty of Arts of P. J. Šafárik University.

## **4.2. Measures**

### **4.2.1. Smoking and Alcohol Consumption**

Smoking and alcohol consumption were measured by single item measures: “How often (if ever) have you smoked cigarettes / drunk alcohol during the last 30 days?” The items were rated on a 4-point scale: 1-not at all; 4- 5 or more times (Hibbel et al., 2012). For the purpose of this study, the items were dichotomized (0=not used, 1=used).

### **4.2.2. Meaningful Participation in Community (ComPart)**

There were 3 items which assessed opportunities for meaningful participation in the community (the Resilience Youth Development Module of the California Healthy Kids Survey, (Furlong, Ritchey, & O’Brennan, 2009)). The scale measures schoolchildren’s meaningful participation or involvement in relevant, engaging and interesting activities with opportunities for responsibility and contribution in the community. The response scale used was: not at all true, a little true, pretty much true and very much true. A sample item was: “I help other people”. The mean scores were created based on the schoolchildren’s responses across all items, with higher scores indicating higher meaningful participation in the community. The Cronbach’s alpha for the subscale in this questionnaire was 0.69 (T3).

### **4.2.3. Satisfaction with Oneself**

Satisfaction with oneself (“How satisfied are you usually with yourself?”) was measured on a five-item Likert scale from very dissatisfied to very satisfied (Hibbel, Guttormsson, Ahlström, & Kraus, 2012).

## **4.3. Statistical Analyses**

The chi-square test for independence, binary logistic regressions and the serial mediation analyses through the Hayes’ *PROCESS* tool (Model 6) (Field, 2013) were performed in SPSS 25. The mediation effects were tested on 5000 samples by means of Bootstrapping. The controlled variables in the logistic regression and the serial mediation analyses were smoking<sup>T2</sup> or alcohol consumption<sup>T2</sup>, as well as the pre-test and gender.

The respondents were compared with regard to the number of waves in which they had participated. There were no significant differences in smoking, alcohol consumption, ComPart or satisfaction with oneself between the respondents who had taken part in different numbers of waves (i.e. only participated in the first wave, up to all waves).

## 5. RESULTS

### 5.1. Descriptive Analysis

A chi-square test for independence indicated no significant associations between the groups (the experimental group and the control group) in either smoking or alcohol consumption immediately after implementing the program (T2), and a year after program implementation (T3) (Table 1).

*Table 1.*  
*Descriptive characteristics of the control and experimental group at two follow up measures.*

	ComPart	S	Smoking				Alcohol consumption			
			T2		T3		T2		T3	
			no	yes	no	yes	no	yes	no	yes
CG	Mean 8.21	Mean 3.42	415	39	364	70	361	91	294	138
	SD 2.88	SD 1.16	91.40%	8.60%	83.90%	16.10%	79.90%	20.10%	68.10%	31.90%
EG	Mean 8.56	Mean 3.39	572	52	491	106	477	144	430	164
	SD 2.70	SD 1.15	91.70%	8.30%	82.20%	17.80%	76.80%	23.20%	72.40%	27.60%

Notes: control group (CG), experimental group (EG), T2 (immediately after program implementation), T3 (one year after program implementation), ComPart = Meaningful participation in the community, S = Satisfaction with oneself

### 5.2. The effect of the Unplugged Program on Smoking and Alcohol Consumption

In order to test whether the Unplugged program affects smoking and alcohol consumption as reported by schoolchildren a year after program implementation (T3) within a Solomon four group design, binary logistic regressions (Table 2) were conducted in which the control variables were regressed (smoking or alcohol consumption as reported by schoolchildren immediately after program implementation (T2), the pre-test, and gender) and the Unplugged program. It also explored whether the effect of Unplugged on smoking and alcohol consumption was moderated by control variables. All interaction effects without a statistically significant contribution to the model were eliminated from the analyses.

The final model for smoking which contained the control variables and Unplugged was statistically significant,  $X^2(4, N = 816) = 137.37, p < .001$ . The main and moderated effects of Unplugged on smoking as reported by schoolchildren a year after program implementation were not statistically significant.

The model for alcohol consumption which contained the control variables, Unplugged, and one interaction Unplugged x Pre-test with a significant contribution to the model was statistically significant,  $X^2(5, N = 809) = 127.96, p < .001$ . The effect of Unplugged on alcohol consumption as reported by schoolchildren a year after program implementation was confirmed and this effect was moderated by the pre-test (Figure 1). The percentage of schoolchildren without a pre-test who reported alcohol consumption a year after program implementation was significantly lower in the experimental group compared to the control group.

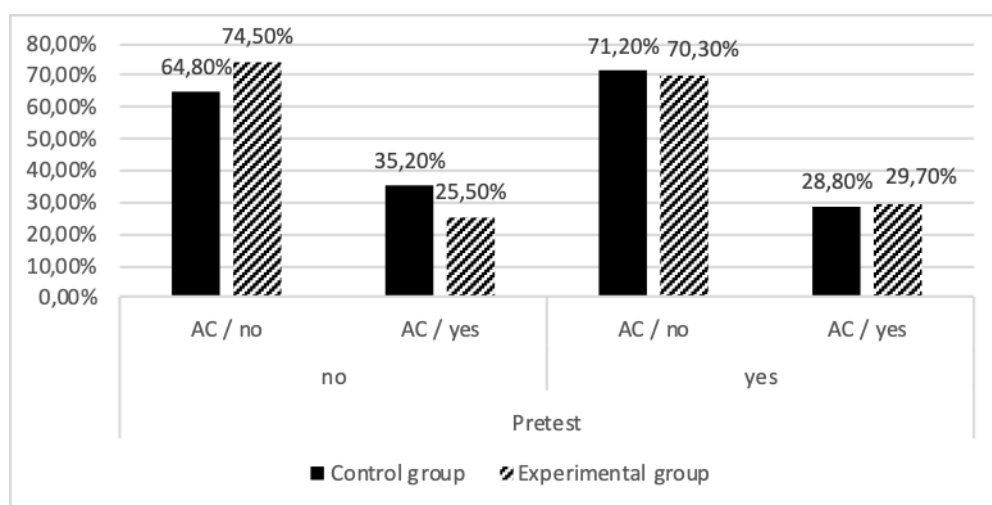
*Table 2.*  
*Binary logistic regressions, the contribution of the control variables and the Unplugged program on smoking and alcohol consumption a year after program implementation (T3) among schoolchildren.*

Smoking				Alcohol consumption			
	Exp(B)	95% C.I.for EXP(B)			Exp(B)	95% C.I.for EXP(B)	
Smoking <sup>T2</sup>	28.318***	14.806	54.162	AC <sup>T2</sup>	7.427***	5.082	10.854
Pre-test	1.964**	1.269	3.04	Pre-test	0.783	0.476	1.289
Gender	1.669 <sup>°</sup>	1.089	2.557	Gender	1.069	0.764	1.496
Unplugged	0.899	0.589	1.374	Unplugged	0.393****	0.243	0.635
				Unplugged x Pre-test	2.005*	1.022	3.936
R <sup>2</sup>	0.26			R <sup>2</sup>	0.21		

<sup>1</sup>Notes: AC = alcohol consumption, T2 = immediately after program implementation, R<sup>2</sup> = Nagelkerke R Square

\*p < .05, \*\*p < .01, \*\*\*p < .001

*Figure 1.*  
*Alcohol consumption (AC) among schoolchildren in the control group and experimental group with / without a pre-test a year after program implementation (T3).*



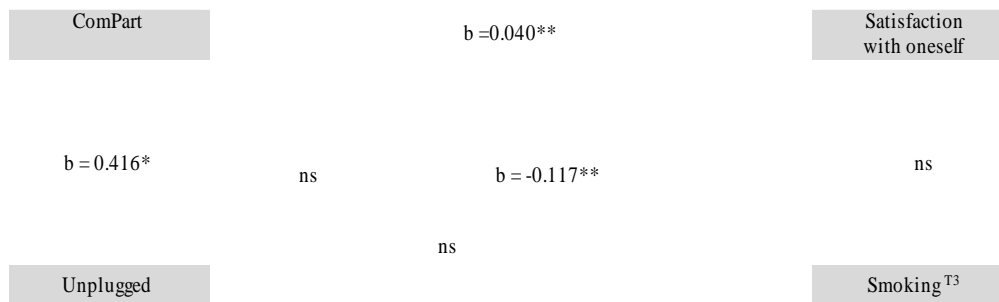
### 5.3. Serial Mediation

A serial multiple mediation model was created using community participation and satisfaction with oneself as the mediators. Smoking<sup>T2</sup> or alcohol consumption<sup>T2</sup>, the pre-test, and gender were controlled throughout these analyses. In the serial mediation, the mediators were assumed to have a direct effect on each other, and the independent variable (Unplugged) was assumed to influence the mediators in a serial way that ultimately influences the dependent variables (smoking or alcohol consumption one year after program implementation) (Figures 2, 3).

The data did not support the serial mediation hypothesis with regard to smoking. Indeed, the long-way specific indirect effect of Unplugged -> ComPart -> satisfaction with oneself -> smoking one year after program implementation was not statistically significant (Figure 2). The direct effect of the Unplugged program on smoking one year after program implementation was also not statistically significant (Figure 2). Only one shortcut mediation, which included one of the explored mediators, was statistically significant. This means that Unplugged affected schoolchildren's ComPart as well as the direct effect of ComPart on smoking being confirmed (effect: -0.049; 95 % CI: -0.1169 to -0.0002). In other words, a higher level of ComPart among schoolchildren in the experimental group was associated with a lower likelihood of the schoolchildren reporting smoking one year after program implementation (Table 1, Figure 2).

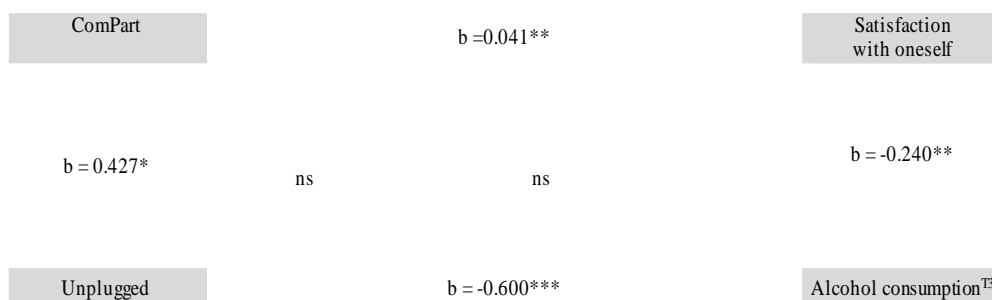
In terms of alcohol, the results of the data analyses supported the serial mediation hypothesis. The long-way specific indirect effect of Unplugged -> ComPart -> satisfaction with oneself -> alcohol consumption one year after program implementation was statistically significant (effect: -0.004; 95 % CI: -0.012 to -0.0001, Figure 3). The direct effect of the Unplugged program on alcohol consumption one year after program implementation was statistically significant (effect: -0.600,  $p < 0.001$ ). 68.1% of schoolchildren in the control group and 72.4% in the experimental group did not report alcohol consumption one year after program implementation (Table 1).

Figure 2.  
Serial mediation model for smoking.



Notes: smoking<sup>T2</sup>, pre-test, and gender were controlled throughout these analyses, T2 = immediately after program implementation, T3 = one year after program implementation, ComPart = Meaningful participation in community, \* $p < .05$ , \*\* $p < .01$

Figure 3.  
Serial mediation model for alcohol consumption.



Notes: alcohol consumption<sup>T2</sup>, pretest, and gender were controlled throughout these analyses, T2 = immediately after program implementation, T3 = one year after program implementation, ComPart = Meaningful participation in community. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

## 6. DISCUSSION AND CONCLUSIONS

The results of this study did not support either the direct effect of the Unplugged program on smoking or the serial mediation hypothesis, the long-way specific indirect effect Unplugged  $\rightarrow$  ComPart  $\rightarrow$  satisfaction with oneself  $\rightarrow$  smoking one year after program implementation. However, one shortcut mediation was confirmed which was the effect of Unplugged on schoolchildren's smoking through ComPart. This finding is consistent with previous findings that have supported the importance of community protective factors among younger adolescents in particular. This is in contrast to peer and school factors which have been identified as stronger factors among older adolescents (Cleveland, Feinberg, Bontempo, & Greenberg, 2008). Inverse associations between community meaningful participation and multiple substance use measures were found. The association between lower level of ComPart and tobacco use (ever and recent) was observed (Hodder et al., 2016), but was inconsistent with the findings suggesting effectiveness of the universally implemented school-based intervention program in reducing the prevalence of tobacco, alcohol use, or in increasing the protective factors addressing also to ComPart which were not confirmed among students nor among student subgroups defined by sociodemographic characteristics or previous substance use (Hodder et al., 2017, 2018).

The results of the current study related to alcohol consumption have confirmed the long-way mediation that represent a causal chain of explored mediators (Demming, Jahn, & Boztağ, 2017). Two shortcut mediations, which each include only one of the explored mediators, were not statistically significant. It means that (i) Unplugged affected schoolchildren's ComPart although the direct effect of ComPart on alcohol consumption was not confirmed, (ii) Unplugged did not affect satisfaction with oneself directly although a direct effect of satisfaction with oneself on alcohol consumption was found. These findings support previous findings which have confirmed that after-school programs, volunteering, community, social group activities, as well as helping behaviour were associated with improved self-esteem and mental health (Santini et al., 2020, Santini et al., 2020, Durlak & Weissberg, 2007, Wilson, 2000), supporting the association between self-esteem and



alcohol consumption (Richardson, Kwon, & Ratner, 2013). Based on the results of this study, schoolchildren's ComPart did not affect alcohol consumption directly but indirectly through satisfaction with oneself.

The explored mediation effects confirmed that the development of personal skills and social skills as well as normative education reached through the implementation of the Unplugged program produces a higher level of ComPart. This generally means that schoolchildren's meaningful participation in activities supporting their interests such as sports or other activities with opportunities to exercise their responsibility and their contribution beyond school activities is related to a higher ComPart. These results further suggest that ComPart is a significant predictor of smoking reported by schoolchildren, as well as satisfaction with oneself which in turn reduces the probability of reporting alcohol consumption.

A direct effect of Unplugged on schoolchildren's alcohol consumption one year after Unplugged implementation was confirmed simultaneously controlling for alcohol consumption<sup>T2</sup>, the pre-test, and gender. These results have extended previous findings related to the effectiveness of Unplugged in reducing episodes of drunkenness among pupils in seven European countries (Vigna-Taglianti et al., 2014). There was no effect of the intervention found for current alcohol use among adolescents in the Czech Republic (Gabrhelik et al., 2012).

The findings of this study contribute to the growing body of evidence of the need to systematically evaluate school-based drug use prevention programmes. However, the limitations and strengths of this study must also be highlighted. The most significant limitations of this study were that the measures were self-reported and satisfaction with oneself was assessed by a single question (Hibbel et al., 2012) as an available balance between practical needs and psychometric concerns of research with repeated measures design (Robins, Hendin, & Trzesniewski, 2001).

The main strength was that it was a cluster randomized controlled trial conducted with a Solomon four group design to filter out the effects of pre-test sensitization (Mai, Takahashi, & Oo, 2020).

It can be concluded that there was a direct effect of Unplugged on AC<sup>T3</sup> and that this effect was moderated by a pre-test. However, a similar effect on S<sup>T3</sup> was not found. The effect of Unplugged on AC<sup>T3</sup> was serially mediated by meaningful participation in the community<sup>T3</sup> and satisfaction with oneself<sup>T3</sup>. There was one shortcut mediation effect of Unplugged on S<sup>T3</sup> through meaningful participation in the community<sup>T3</sup> confirmed in the current study.

Finally, an evaluation of the effectiveness of prevention programs carried out in schools should consider fidelity, quality of implementation and teachers' leadership. It should also clarify and refine the requirements for school administrations regarding the personal and organizational capacity, especially support from the principal is needed for prevention activities (Fikretoglu, Easterbrook, & Nazarov, 2022, Orosová & Majdanová, 2021, Sanchez et al., 2021, Payne, Gottfredson, & Gottfredson, 2006). The key finding of this study and the key message for school staff is the impact of the Unplugged as a drug use prevention program supporting schoolchildren's participation in meaningful activities that are not limited to the school domain. Teachers and school psychologists can promote health-related behavior by encouraging schoolchildren to participate in activities that allow to them to experience success, belonging, developing satisfaction with oneself through the successful implementation of the Unplugged program.

## REFERENCES

- Agabio, R., Trincas, G., Floris, F., Mura, G., Sancassiani, F., & Angermeyer, M. C. (2015). A systematic review of school-based alcohol and other drug prevention programs. *Clinical practice and epidemiology in mental health: CP & EMH*, 11(Suppl 1 M6), 102.
- Braver, M. W., & Braver, S. L. (1988). Statistical treatment of the Solomon four-group design: A meta-analytic approach. *Psychological bulletin*, 104(1), 150-154.
- Caria, M. P., Faggiano, F., Bellocco, R., Galanti, M. R., & EU-Dap Study Group. (2011). Effects of a school-based prevention program on European adolescents' patterns of alcohol use. *Journal of Adolescent Health*, 48(2), 182-188.
- Cleveland, M. J., Feinberg, M. E., Bontempo, D. E., & Greenberg, M. T. (2008). The role of risk and protective factors in substance use across adolescence. *Journal of Adolescent Health*, 43(2), 157-164.
- Chinman, M. J., & Linney, J. A. (1998). Toward a model of adolescent empowerment: Theoretical and empirical evidence. *Journal of Primary Prevention*, 18(4), 393-413.
- Demming, C. L., Jahn, S., & Boztağ, Y. (2017). Conducting mediation analysis in marketing research. *Marketing: ZFP—Journal of Research and Management*, 39(3), 76-93.
- Durlak, J. A., & Weissberg, R. P. (2007). *The impact of after-school programs that promote personal and social skills*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.
- ESPAD Group (2020). *ESPAD report 2019 results from the European School Survey Project on Alcohol and Other Drugs*. Luxembourg: EMCDDA Joint Publications, Publications Office of the European Union.
- European Monitoring Centre for Drugs and Drug Addiction. (2019). *European Prevention Curriculum: a handbook for decision-makers, opinion-makers and policy-makers in science-based prevention of substance use*. Luxembourg: Publications Office of the European Union.
- Faggiano, F., Vigna-Taglianti, F., Burkhart, G., Bohrn, K., Cuomo, L., Gregori, D., ... & EU-Dap Study Group. (2010). The effectiveness of a school-based substance abuse prevention program: 18-month follow-up of the EU-Dap cluster randomized controlled trial. *Drug and alcohol dependence*, 108(1-2), 56-64.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. London: Sage.
- Fikretoglu, D., Easterbrook, B., & Nazarov, A. (2022). Fidelity in workplace mental health intervention research: A narrative review. *Work & Stress*, 36(1), 6-29.
- Furlong, M. J., Ritchey, K. M., & O'Brennan, L. M. (2009). Developing norms for the California Resilience Youth Development Module: Internal assets and school resources subscales. *The California school psychologist*, 14(1), 35-46.
- Gabrhelik, R., Duncan, A., Miovisky, M., Furr-Holden, C. D. M., Stastna, L., & Jurystova, L. (2012). "Unplugged": A school-based randomized control trial to prevent and reduce adolescent substance use in the Czech Republic. *Drug and Alcohol Dependence*, 124(1-2), 79-87.
- Hibbel, B., Guttormsson, U., Ahlström, S., & Kraus, L. (2012). *The 2011 ESPAD Report. Substance use among students in 36 European Countries*. Stockholm: Modintryckoffset AB, ISBN 978-91-7278-233-4
- Hodder, R. K., Freund, M., Bowman, J., Wolfenden, L., Campbell, E., Dray, J., ... & Wiggers, J. (2018). Differential intervention effectiveness of a universal school-based resilience intervention in reducing adolescent substance use within student subgroups: exploratory assessment within a cluster-randomised controlled trial. *BMJ open*, 8(8), e021047.
- Hodder, R. K., Freund, M., Bowman, J., Wolfenden, L., Campbell, E., Dray, J., ... & Wiggers, J. (2017). Effectiveness of a pragmatic school-based universal resilience intervention in reducing tobacco, alcohol and illicit substance use in a population of adolescents: cluster-randomised controlled trial. *BMJ open*, 7(8), e016060.
- Hodder, R. K., Freund, M., Bowman, J., Wolfenden, L., Gillham, K., Dray, J., & Wiggers, J. (2016). Association between adolescent tobacco, alcohol and illicit drug use and individual and environmental resilience protective factors. *BMJ open*, 6(11), e012688.
- Huebner, E. S., Valois, R. F., Suldo, S. M., Smith, L. C., McKnight, C. G., Seligson, J. L., & Zullig, K. J. (2004). Perceived quality of life: A neglected component of adolescent health assessment and intervention. *Journal of adolescent health*, 34(4), 270-278.

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- Kreeft, P. V. D., Wiborg, G., Galanti, M. R., Siliquini, R., Bohrn, K., Scatigna, M., ... & EU-Dap Study Group. (2009). 'Unplugged': a new European school programme against substance abuse. *Drugs: education, prevention and policy*, 16(2), 167-181.
- Mai, N. N., Takahashi, Y., & Oo, M. M. (2020). Testing the Effectiveness of Transfer Interventions Using Solomon Four-Group Designs. *Education Sciences*, 10(4), 92.
- Miller, T. R., & Hendrie, D. (2009). *Substance abuse prevention dollars and cents: A cost-benefit analysis*. Rockville, MD: US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Prevention.
- Nakazwe, K. C., & Chanda, P. (2018). Monitoring and Evaluation Designs. *Participatory Monitoring and Evaluation for Projects, Programmes or Policies*, 85.
- Orosová, O., Gajdošová, B., Bacíková-Šléšková, M., Benka, J., & Bavoľár, J. (2020). Alcohol Consumption among Slovak Schoolchildren: Evaluation of the Effectiveness of the Unplugged Programme. *Adiktologie*, 20, 89-96.
- Orosová, O., & Majdanová, M. (2021). The Effectiveness, Quality of Implementation of a School Prevention Program on Drug Use and Leadership in a School Context. *Psychologie a její kontexty*, 12(2), 107-122.
- Orosová, O., Gajdošová, B., Bačíková-Šléšková, M., Benka, J., Bavoľár, J. (2019). Smoking among Slovak Schoolchildren. Evaluation of the Effectiveness of the Unplugged Programme. *Adiktologie*, 19(2), 85-93.
- Payne, A. A., Gottfredson, D. C., & Gottfredson, G. D. (2006). School predictors of the intensity of implementation of school-based prevention programs: Results from a national study. *Prevention Science*, 7(2), 225-237.
- Proctor, C., & Linley, P. A. (2014). Life satisfaction in youth. In G. A. Fava & C. Ruini (Eds.), *Increasing psychological well-being in clinical and educational settings: Interventions and cultural contexts* (pp. 199-215). Springer Science + Business Media. [https://doi.org/10.1007/978-94-017-8669-0\\_13](https://doi.org/10.1007/978-94-017-8669-0_13).
- Richardson, C. G., Kwon, J. Y., & Ratner, P. A. (2013). Self-esteem and the initiation of substance use among adolescents. *Canadian journal of public health*, 104(1), e60-e63.
- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. *Personality and social psychology bulletin*, 27(2), 151-161.
- Sanchez, Z. M., Valente, J. Y., Gusmões, J. D., Ferreira-Junior, V., Caetano, S. C., Cogo-Moreira, H., & Andreoni, S. (2021). Effectiveness of a school-based substance use prevention program taught by police officers in Brazil: Two cluster randomized controlled trials of the PROERD. *International Journal of Drug Policy*, 98, 103413.
- Santini, Z. I., Meilstrup, C., Hinrichsen, C., Nielsen, L., Koyanagi, A., Koushede, V., ... & Madsen, K. R. (2020). Associations between multiple leisure activities, mental health and substance use among adolescents in Denmark: a nationwide cross-sectional study. *Frontiers in behavioral neuroscience*, 14, 232.
- Santini, Z. I., Stougaard, S., Koyanagi, A., Ersbøll, A. K., Nielsen, L., Hinrichsen, C., ... & Koushede, V. (2020). Predictors of high and low mental well-being and common mental disorders: findings from a Danish population-based study. *European Journal of Public Health*, 30(3), 503-509.
- Vigna-Taglianti, F. D., Galanti, M. R., Burkhart, G., Caria, M. P., Vadrucci, S., & Faggiano, F. (2014). "Unplugged," a European school-based program for substance use prevention among adolescents: Overview of results from the EU-Dap trial. *New directions for youth development*, 2014(141), 67-82.
- Willis, C., Girdler, S., Thompson, M., Rosenberg, M., Reid, S., & Elliott, C. (2017). Elements contributing to meaningful participation for children and youth with disabilities: a scoping review. *Disability and rehabilitation*, 39(17), 1771-1784.
- Wilson, J. (2000). Volunteering. *Annual review of sociology*, 26(1), 215-240.
- Zimmerman, M. A., & Maton, K. I. (1992). Life-style and substance use among male African American urban adolescents: A cluster analytic approach. *American Journal of Community Psychology*, 20(1), 121-138.

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## AUTHORS' INFORMATION

**Full name:** Olga Orosova, PhD., Prof.

**Institutional affiliation:** Department of Educational Psychology and Health Psychology, Faculty of Arts, PJ Safarik University in Kosice

**Institutional address:** Moyzesova 9, Kosice 040 01, Slovak Republic

**Short biographical sketch:** Olga Orosova is a professor of Educational, Counseling, and School Psychology. She is a principal investigator of research projects focusing on the factors of risk behavior among adolescents and young adults and the effectiveness of drug use prevention programs.

**Full name:** Beata Gajdosova, PhD., Assoc. Prof.

**Institutional affiliation:** Department of Educational Psychology and Health Psychology, Faculty of Arts, PJ Safarik University in Kosice

**Institutional address:** Moyzesova 9, Kosice 040 01, Slovak Republic

**Short biographical sketch:** Beata Gajdošová is the head of the Department of Educational and Health Psychology. She also serves at the university as the coordinator for students with special needs. Her research is mainly focused on intrapersonal factors and their role in health related behaviours. She is active in psychological counselling work and psychotherapy based on working with clients in The Client-Centred counselling and psychotherapy. She is a member of the European Health Psychology Society, International School Psychology Association and of the Slovak Psychotherapeutic Society.

**Full name:** Jozef Benka, Mgr., PhD. et PhD

**Institutional affiliation:** Department of Educational Psychology and Health Psychology, Faculty of Arts, PJ Safarik University in Kosice

**Institutional address:** Moyzesova 9, 040 01 Košice, Slovak Republic

**Short biographical sketch:** Jozef Benka completed two PhD programs in Health Sciences at University of Groningen, the Netherlands and in Social Psychology at Pavol Jozef Šafárik University in Košice, Slovakia. While his teaching activities focuses especially on Personality psychology, Psychology of emotion and motivation and Self-determination theory, his research interests are mainly about quality of life in chronic disease and also about life perspective, wellbeing and risk behaviours of students and young adults.