



Personality, learning strategies, and school performance in adolescents

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ABSTRACT

The aim of this study is to analyze the relationships between personality factors, learning strategies and school performance in adolescents. The study was attended by 499 students enrolled in seven high schools in Constanța County, 240 boys (48%) and 259 girls (52%), aged between 14 and 18 years, $M = 16.80$, $SD = .82$. The instruments used were the Questionnaire for Learning Strategies and School Motivation Assessment, SMALSI (Stroud & Reynolds, 2006) and the CP5F Questionnaire (Albu, 2008) based on the Five-Factor Personality Inventory, FFPI (Hendriks, 1997). School performance was represented by the general grade obtained by the students in the previous year of study. The results showed that, among the personality factors, only agreeableness and autonomy are positively associated with school performance. However, personality factors are positively associated with learning strategies, which mediate the relationship between them and school performance. Students' weaknesses (low academic motivation, test anxiety, attention difficulties) are negatively associated with academic performance and mediate its relationship with personality factors. The practical implications of the study address the need to provide students with appropriate learning opportunities and especially to teach them how to learn, in order to adopt the most appropriate strategies that will lead them to success.

Keywords: *learning strategies, school performance, adolescents, personality*

1. INTRODUCTION

The purpose of this study is to identify the psychological factors that contribute to the success in exams and

assessments, in order to facilitate the academic success of adolescents. Thus, we will be able to potentiate the positive

impact and to diminish the negative aspects of the identified factors, in the didactic process, proposing a set of operational methodological suggestions.

Big Five model of personality

Personality was a subject of intense scientific interest until the 1970s, after which it declined. In the last two decades, it has returned to the attention of specialists, being more complexly approached. Leaving behind the theories of personality that explain "what people do" (Mischel, 1968), modern theories try to support the existence of stable traits over time and to empirically demonstrate the consistency of individual differences, the existence of psychobiological determinants, and the effectiveness in predicting behavioral trends or pervasive and compelling manifestations (Hogan, Johnson, & Briggs, 1997; Matthews, Deary, & Whiteman, 2003).

The Big Five model organizes the differences manifested in the social and emotional life of the individual into five analytically derived categories, called extraversion (vs. introversion), emotional stability (vs. neuroticism), conscientiousness, agreeableness, and openness to experiences (openness to knowledge). Psychology of personality traits is currently the most widespread and recognized contribution to personality psychology and behavioral and social sciences in general. The mission of personality psychology is to provide a framework for understanding the person as a whole, and this desideratum is excellently suggested in the well-known assertion of Kluckhohn and Murray (1953, cited in McAdams & Pals, 2006), who argue that personality psychology must provide the integrative framework for understanding the typical characteristics of human nature (the extent to which one person is similar to all other people), the individual differences in certain characteristics (the extent to which a person is similar to certain other people) and the unique individual pattern (the extent to which a person does not resemble any other person).

Of the five personality factors, extraversion and neuroticism are the best understood in terms of the processes that determine them. There is considerable theoretical and experimental evidence that the two traits represent the primary manifestations in the personality of sensitivity to reward and threat and punishment, respectively (Clark & Watson, 2008). Extraversion is associated with a tendency to experience positive emotions (Clark & Watson, 2008), which have their origins in experiencing the reward or the promise of the reward. Extraversion includes a number of traits, such as assertiveness, sociability, and the pleasure of communicating, which seem to be associated with the tendencies of closeness that accompany the sensitivity to rewards. Extraversion is often manifested in social behavior, this phenomenon being probably caused by the fact that human rewards presuppose an affiliation or a social status,

so that sensitivity to reward remains the central element of extraversion.

Neuroticism is associated with a tendency to experience negative emotions (Clark & Watson, 2008) and includes traits such as anxiety, self-awareness, and irritability. It is therefore possible that neuroticism is associated with the structural variation of some or all of the brain systems associated with threat and punishment sensitivity, including the amygdala, anterior cingulate cortex, median prefrontal cortex, and hippocampus (Eisenberg & Lieberman, 2004). The involvement of these brain regions in self-assessment and emotion regulation is associated with certain aspects of neuroticism, such as low self-esteem, ruminating, or emotional disorders (John et al., 2008).

Agreeableness includes traits associated with altruism, concern for the needs, desires, and rights of others, as opposed to the pleasure of being with others, which is specific to extraversion. The positive pole of agreeableness is described by prosocial traits such as cooperation, compassion, politeness, while the negative pole is described by antisocial traits such as malice and aggression. Agreeableness has been associated with psychological mechanisms for understanding the emotions, intentions, and mental states of others, including empathy, mind theory, and other forms of social information processing (Nettle & Liddle, 2008). It is therefore assumed that agreeableness is associated with the brain structures involved in these mechanisms, namely the superior temporal sulcus, temporoparietal junction, and posterior cingulate cortex (Saxe & Powell, 2006).

Conscientiousness reflects the ability or tendency of individuals to inhibit or retain impulses in order to follow rules or to achieve distant goals. This trait is associated with academic and occupational success, as well as behaviors that promote health and longevity (Ozer & Benet-Martinez, 2006). Conscientiousness is characterized by traits such as diligence, order, and self-discipline, as opposed to impulsiveness, distraction, and disorganization. It is thought to be associated with the functions of the prefrontal cortex, which is responsible for much of people's ability to plan and follow complex rules (Bunge & Zelazo, 2006).

Openness or Intellect reflects the tendency to process abstract and perceptual information in a flexible and efficient manner, encompassing traits such as imagination, intellectual involvement, and aesthetic interests (DeYoung, Peterson, & Higgins, 2005). A high level of openness suggests a wider range of information processing, an increase in the depth and permeability of consciousness (McCrae & Costa, 1997). This trait is associated with the prefrontal cortex and its functionally correlated regions, especially those involved in working memory, abstract reasoning, and attention control (DeYoung et al., 2005). Openness is the trait consistently and positively associated with intelligence, which is governed by brain systems that

substantially overlap with the working memory network, namely the dorsolateral and anterior prefrontal cortex and the anterior parietal cortex (Gray, Chabris, & Braver, 2003).

The Big Five taxonomy was never intended to be a comprehensive theory of personality, but is considered a model of personality based on the structural relationships between personality traits (Goldberg, 1993). This model is descriptive, not explanatory, describing behavioral regularities and not dynamic and developmental processes, focusing on variables, not individuals or types of individuals. It also provides a conceptual foundation that facilitates the examination of theoretical aspects. According to the Big Five model, each of the five domains have six facets. Although a domain is made up of the sum of its facets, the facets themselves provide much more information about the individual, giving greater accuracy to the identification of problems, but also to therapeutic recommendations (McCrae & Costa, 1996).

Personality and school performance

Personality contributes significantly to the predictive power of assessments in studying children's developmental outcomes, being useful in areas such as adaptation, self-regulation, delinquent behavior, behavioral problems, or risk behaviors (Ehrler, Evans, & McGhee, 1999). At the same time, it can be useful in determining the traits that may be involved in positive social interactions and school outcomes (Kamphaus & Frick, 2005). Certain personality inventories facilitate the prediction of internalization problems, considered to be associated with excessive control, but also of externalization problems, associated with insufficient control (Mash & Barkley, 2003).

Personality traits are associated with general intelligence (Chamorro-Premuzic & Furnham, 2006), but also with academic results (Furnham & Chamorro-Premuzic, 2004). A number of studies have shown that agreeableness, conscientiousness, and openness are positively associated with school performance and overall intelligence (Busato et al., 2000; Fritche, McIntyre, & Yost, 2002; Paunonen & Ashton, 2001). Conscientiousness is also a consistent predictor of higher education performance (Noftie & Robins, 2007), but also of academic success in adulthood (Shiner, 2000).

Neuroticism has been shown to be a good predictor of performance in less stressful environments (Kappe et al., 2009). Neuroticism was positively associated with high scores on the SAT tests (Zyphur, Islam, & Landis, 2007), the openness was positively associated with verbal scores on the SAT tests, and conscientiousness predicted the performance of both high school students and university students (Noftie & Robins, 2007).

The importance of personality in school success has been analyzed in countless studies and meta-analyses, especially conscientiousness (Almlund et al., 2011; Vedel,

2014). Poropat (2009) found that the relationship between personality and school success changes fundamentally from childhood (11 years) to adolescence (16 years). Agreeableness and emotional stability proved to be as important as conscientiousness in childhood, but in adolescence they became insignificant, as opposed to conscientiousness, which maintained its importance, albeit to a lesser extent.

Studies in the field of organizational psychology have analyzed the relationships between personality factors and work performance, which are then translated into the field of school performance. Each of the five factors of the Big Five model gives the person attributes that can make him or her fit for one area of activity or another.

Extraversion refers to the tendency to be sociable, gregarious, friendly, talkative, and kind to others. People with high levels of extraversion tend to direct their energy towards and be activated by external stimuli, including those around them. People with low scores are more introverted, self-centered, and reserved (Lounsbury et al., 2001). Extraversion is a significant predictor of performance in work, learning, training practices, sales and management (Mount & Brick, 1998).

Emotional stability (as opposed to neuroticism) refers to the general level of adaptation, resilience and self-regulation of the person. High scores are associated with increased performance under stress. People with low scores are less tolerant of stress and more reactive to environmental pressures (Lounsbury et al., 2001). Emotional stability is positively associated with work performance, especially in contexts involving teamwork and interactions with colleagues (Hurtz & Donovan, 2000).

Agreeableness describes participatory people, eager to help, cooperative and inclined to interact with others in a harmonious manner. Agreeableness scores are characteristic of people who work well in groups, make friends easily, and participate in collaborative projects. Low scores describe people with opposition, critical, and contentious tendencies (Lounsbury et al., 2001). Agreeableness is associated with performance in activities that involve interaction and interpersonal closeness. Agreeable people are usually well regarded and appreciated by superiors (Ones & Viswesvaran, 2001).

Conscientiousness is generally described by involvement, devotion and willingness to internalize societal norms and values. People with high scores prefer to work in well-structured environments with clear rules. Those with low scores tend to be nonconformist and prefer less structured environments that allow for spontaneity (Lounsbury et al., 2001). Conscientiousness is the personality factor that has been most intensively studied in relation to performance, from work performance to academic performance or performance tests in general (Barrick et al., 2001; Mellroy & Bunting, 2002).

Openness refers to the ability and desire to accept and understand new ideas, change and variety. People with high scores prefer to choose unique procedures and new ways of doing things. Those with low scores tend to prefer stability and conventional modalities. Openness is associated with performance in unique, unfamiliar contexts where new ideas and behaviors are accepted (Bing & Lounsbury, 2000).

There is a logical continuity between work performance and school performance, as well as between the relationship between personality and performance. The characteristics of the work are also present in the class of students and are found in the activity directed on goals, in the roles formally defined, in expectations, behavioral constraints and specific, measurable results. As Munson and Rubenstein (1992) said, school is the workplace of students, the student is a worker. In school, performance is measured in grades.

Although it is considered that the personality crystallizes only around the age of 30, the Big Five model has proven to be a good predictor of school performance among adolescents. Mervielde, Buyst and De Fruyt (1995) showed that the five personality factors are positively associated with the results obtained by students in national tests. The strongest predictors were extraversion, conscientiousness, and openness; neuroticism was a weaker predictor, as was agreeableness (Mervielde et al., 1995).

Taking into account the above, we aim to analyze the association between personality factors and school performance of adolescents, formulating the following hypotheses:

H1. *Personality is a significant predictor of school performance.*

H1a. *Extraversion is a significant positive predictor of school performance.*

H1b. *Emotional stability is a significant positive predictor of school performance.*

H1c. *Agreeableness is a significant positive predictor of school performance.*

H1d. *Conscientiousness is a significant positive predictor of school performance.*

H1e. *Autonomy is a significant positive predictor of school performance.*

Relationships between personality, learning strategies and school performance

Students' learning strategies are found in the literature in the category of activities specific to self-regulated learning (Pintrich, 1999). Unlike cognitive strategies, they include strategies for repetition, elaboration, organization of materials, and critical thinking. The reason why theories of learning strategies have been developed is that different ways of learning explain different school outcomes. Learning strategies are defined as processes or sequences of processes that, when congruent with the requirements of tasks, facilitate performance (Pressley et al., 1989). These

correlate positively with school performance (Alexander et al., 1998; Hattie et al., 1996).

Learning strategies are divided into several categories, depending on different taxonomies and classifications (Mayer, 2008; Presley, 2002): cognitive strategies, metacognitive strategies and management strategies. Cognitive strategies are used to increase understanding of a particular field and include material repetition, elaboration, and organization. Metacognitive strategies regulate students' cognition by activating relevant approaches and include planning, monitoring and evaluation. Management strategies manage the aspects that directly influence the learning process and include the management of the effort made, the management of the support from colleagues or other people and the management of the environment.

Donker, de Boer, Kostons, Dignath van Ewijk, and van der Werf (2014) in a meta-analysis of learning strategies and their effects on school performance, showed that although many strategies contribute to school success, the strongest are those metacognitive.

Adolescent learning strategies, as measured in the present study, are defined as a set of intentional behaviors of a person aimed at facilitating the acquisition and processing of information during the learning process (Corn, 2010). The term refers to the skills and study strategies specific to the educational environment, but not to the cognitive strategies applied in general, describing independent areas and not a unitary field. Therefore, each learning strategy must be approached separately.

Study strategies refer to those behaviors focused on recapitulating and learning a material, using mnemonic methods or other means to facilitate memorization. These strategies contribute significantly to the development of the ability to encode and extract information (Struggs & Mastropieri, 1992).

Taking notes and listening skills include text-marking actions and are specific learning strategies based on the separation between relevant and least relevant information. The purpose of taking notes is the simultaneous processing of information, but also to facilitate their memorization, and the result is found in the easier reconstitution of information (Porte, 2001). Experts believe that this skill is necessary during the learning process (Wade & Trathen, 1989).

Reading and comprehension strategies include actions such as reading texts, extracting key ideas, self-testing. There is too little time in school to teach children to learn by reading and understanding, although they are among the most important lifelong learning strategies, not just in school.

Writing and research skills are necessary for school success and include the ability to gather information from a variety of sources, make detailed plans, integrate ideas into a plan, study different materials, and complete more complex research tasks.

Tests strategies refer to the behaviors manifested in test and evaluation contexts and include the ability to eliminate improbable variants, the organization of time according to the volume and requirements of the test or the complexity of the items.

Organizing techniques include specific strategies used to organize learning materials and refer to homework preparation, learning materials, organizing tasks that are part of a larger goal.

Time management is a metacognitive technique and refers to the ability to use time as efficiently as possible. Represents skills that can be trained and contributes to gaining control over the learning process and facilitates learning in increasingly complex contexts.

In addition to the seven learning strategies, there are three weaknesses of the students, also included under the "umbrella" of learning strategies.

Low motivation. Motivation is the desire to learn and gain knowledge, it is a trait that can be trained and is based on the student's perceptions about their own successes and failures, but also the nature of the goals they set. Motivation materializes in the student's involvement and investment in learning situations, as well as the volume of effort made to achieve the objectives. The low motivation reflects the lack of involvement and mobilization for the fulfillment of school tasks.

Test anxiety is a factor that can change over time and has negative effects on learning or test results. It refers to the concern about the evaluation contexts and is manifested through marked negative emotional feelings, with transmission including in the somatic sphere.

Attention difficulties. Attention and focus are also key factors in learning to use learning strategies. Attention difficulties origins from both personal and external factors. Regardless of where they come from, attention span has a significant negative effect on the whole process of memorization and learning.

Studies on the relationship between learning strategies and school performance are not very numerous, as the process by which some students end up with high performance is unclear, while others, trained in similar conditions, achieve less noticeable results. In order to be able to make recommendations to students about the most effective learning strategies, teachers and parents must first understand which strategies work among high-performing adolescents. It seems that the most used learning strategy is to read the contents (Callendar & McDaniel, 2009; Carrier, 2003). Other authors have investigated this topic, finding that reading and rereading learning materials is indeed a common practice of students, especially before an examination (Dunlosky & Rawson, 2005). Other studies have shown that the ability of students to control their learning time contributes to increasing academic

achievement (Zimmerman, 1998) by achieving a high level of self-regulation in learning.

Regarding motivation, there are different conceptualizations of how it influences learning, performance, adaptation, and well-being (Vansteenkiste et al., 2005). Of these, the best known is self-determination theory which seeks to explain human behavior by the motivation that animates it and by the types of goals that people set for themselves (Deci & Ryan, 2000). Recent studies have shown that both intrinsic and extrinsic motivation contribute to in-depth learning, which in turn leads to academic success (Mo, 2011). Also, extrinsic motivation can activate intrinsic motivation, both contributing to better learning and implicitly to high school performance (Rassuli, 2012). By contrast, lack of motivation will make it difficult to learn and achieve remarkable school results.

Attention difficulties manifested in classroom are relatively common and are a predictor of poor school performance (DuPaul, Stoner, & O'Reilly, 2002). Poor attentional control or insufficient attention span reduce the effectiveness of learning or make it impossible. Difficulties in concentrating are manifested by a high degree of distractibility and low concentration, which negatively affects students' ability to complete learning tasks and, later, their academic success. Focused attention plays an important role in self-regulation, which is essential for school learning (Eisenberg et al., 2004). School performance requires the student to focus on the task and continue the activity even if more attractive stimuli appear. In psychological terms, as a subjective experience, controlling attention and ignoring more attractive stimuli or distractors are associated with a higher effort on the part of the student. Problems concentrating on schoolwork are negatively associated with school performance (Demaray & Jenkins, 2011; Kamran et al., 2017).

Test anxiety is an undesirable reaction to assessment situations and is one of the most common difficulties reported by students during the school years (Dinga et al., 2018). Test anxiety is a psychological disorder in which students experience extreme distress and anxiety, and at very high levels, it will negatively affect school performance (Oluoch et al., 2018). A study by Nicholson (2009) showed that there are strong associations between anxiety and performance. Khalid and Hassan (2009) conducted a study whose results showed that students with high exam scores report a low level of test anxiety.

Beyond the direct relationships between personality and academic achievement, numerous other relationships have been documented between Big Five factors and other predictors of performance, such as learning approach, learning strategies, cognitive abilities, and academic motivation (Bidjerano & Yun Dai, 2007; Clark & Schroth, 2010; Swanberg & Martinsen, 2010). According to Pintrich (2000), self-regulation in learning mediates the relationship

between personality and school performance. Therefore, we establish the second hypothesis of the present study:

2. METHODOLOGY

Participants and procedure

To conduct this study, 499 students enrolled in seven high schools in Constanța County were tested, 240 boys (48%) and 259 girls (52%), aged between 14 and 18, $M = 16.80$, $SD = .82$. The students were informed about the conduct of this study through the teachers in the high schools in which they are enrolled. They were invited to participate by completing a set of questionnaires, in the classrooms, at one of the classes. In this regard, the agreement of the high school management was obtained, as well as the participation agreement and informal consent of the students' parents. Participation was voluntary and was not rewarded in any way. After receiving the agreements, the students presented their intention to participate in the study. A number of 700 invitations were sent, 100 for each of the seven high schools, the participation rate being 71%. The questionnaires were completed in pencil-paper version between October and December 2019. The duration of completing the questionnaires was approximately 45 minutes. In order to record the school results, the general grades obtained by the students in the previous school year (2018-2019) were requested. For ninth grade students, these grades were taken from high school enrollment files. These data were provided anonymously by the secretariats of the high schools involved in the research. In order to respect the anonymity and confidentiality of the data, each student was assigned an identification code, so that no link could be made between the students' names and the data provided by them.

The present study is cross-sectional, descriptive, exploratory, and correlational. The data were organized in excel tables, then transferred and processed through the IBM SPSS 24 statistical analysis program (IBM Corp, 2016). Mediation analyzes were performed through the medmod module from Jamovi (The Jamovi project, 2020).

Instruments

Learning strategies were measured with Questionnaire of Learning Strategies and Motivation Assessment (Stroud & Reynolds, 2006). This questionnaire was designed to assess the learning strategies and school motivation of students, being translated into Romanian and standardized

3. RESULTS

Descriptive statistics

The means, standard deviations, internal consistency coefficients and correlations among variables are presented in Table 1.

H2. *Learning strategies mediate the relationship between personality and academic performance.*

on the Romanian population by Mihaela Porumb in 2010, under the auspices of Cognitrom (Corn, 2010).

The questionnaire has two forms, one for children aged 8 to 12 and the second for children aged 13 to 18 (teenagers). The second form was used for the present study. The form for teenagers includes 170 items divided into 10 subscales as follows: study strategies 18 items, taking notes and listening skills 19 items, reading and comprehension strategies, 13 items, writing and research skills 13 items, tests strategie 15 items, organizing techniques 18 items, time management 17 items, low academic motivation 17 items, test anxiety 23 items, attention difficulties 17 items.

For each of the items in the questionnaire, an answer is given from 0 to 3 where 0 - never, 1 - sometimes, 2 - often, 3 - always, depending on the extent to which the child considers that the item suits him. Scoring is done by summing up the students' answers. Examples of items: "I know how to organize my work and do my homework in order of priority", "I don't care if the class is messy".

This questionnaire is widely used (especially abroad) in school settings in the presence of the school counselor and requires a license to use and professional accreditation. It is also used in psychological offices for school and vocational guidance, to identify possible learning disabilities or to improve students' school performance.

Personality factors were measured with the CP5F Questionnaire, developed by Albu (2008) following the model of the Five-Factor Personality Inventory, FFPI (Hendriks, 1997; Hendriks et al., 1997). The instrument measures five dimensions of personality, namely extraversion, emotional stability, kindness (agreeableness), conscientiousness and autonomy (openness or creativity). The questionnaire includes 100 items, 20 for each dimension of the personality. The translation and adaptation of the questionnaire was done with the consent of the author. Scores are offered on a five-step Likert scale, where 1 - suits me very little and 5 - suits me very well. Examples of items: "I spread joy around me", "I look for the good in bad things".

School performance was the overall grade of students obtained in the school year immediately preceding..

It is observed that students' scores on the five personality factors are relatively high. Thus, for extraversion, $M = 72.49$, $SD = 13.29$, for conscientiousness, $M = 88.23$, $SD = 13.45$,

for agreeableness, $M = 84.26$, $SD = 12.65$, for emotional stability, $M = 71.78$, $SD = 9.36$, and for autonomy, $M = 76.51$, $SD = 10.79$. In terms of learning strategies, the highest score was for taking notes and listening skills, $M = 48.39$, $SD = 8.28$, and the lowest score was for writing and research skills, $M = 29.04$, $SD = 5.43$. Of the weaknesses included in the learning strategies, the highest score was on test anxiety, $M = 46.10$, $SD = 10.51$, followed by attention

difficulties, $M = 37.65$, $SD = 7.87$ and then by low motivation, $M = 34.57$, $SD = 7.77$.

The school performance of the students is high, registering $M = 8.78$, $SD = 1.01$.

It was also observed that skewness and kurtosis are in the acceptable range (-2, 2), which means a normal data distribution.

Table 1. Mean scores, standard deviations, internal consistency coefficients, and correlations between variables

	M	AS	α	EX	CO	AG	SE	AU	ST	LN	CI	SC	TE	OM	OT	MS	AT	DC	PS	
EX	72.49	13.29	.82	1																
CO	88.23	13.45	.85	.14	1															
AG	84.26	12.65	.84	.01	.54**	1														
SE	71.78	9.36	.69	.07	.29**	.21**	1													
AU	76.51	10.79	.78	.43**	.31**	-.05	.25**	1												
ST	46.76	7.89	.71	.20**	.38**	.29**	.30**	.23**	1											
LN	48.39	8.28	.81	.14**	.46**	.34**	.18**	.12**	.70**	1										
CI	32.24	6.57	.81	.22**	.34**	.21**	.20**	.24**	.66**	.68**	1									
SC	29.04	5.43	.62	.17**	.35**	.31**	.22**	.22**	.64**	.61**	.66**	1								
TE	44.99	7.48	.75	.13**	.49**	.35**	.29**	.24**	.66**	.65**	.49**	.57**	1							
OM	35.42	6.75	.60	.14**	.44**	.30**	.20**	.18**	.66**	.68**	.57**	.61**	.61**	1						
OT	42.64	7.71	.80	-.13**	.44**	.22**	.18**	.18**	.65**	.64**	.56**	.55**	.58**	.69**	1					
MS	34.57	7.77	.85	.08	-.40**	-.32**	-.09	-.09	-.22**	-.37**	-.17**	-.21**	-.37**	-.27**	-.26**	1				
AT	46.10	10.51	.89	.27**	-.14**	-.04	.10	-.19**	.04	-.02	-.02	-.05	-.13**	-.00	.00	.47**	1			
DC	37.65	7.87	.86	-.08	-.19**	-.30**	.02	.11	-.20**	-.42**	-.19**	-.19**	-.33**	-.31**	-.33**	.72**	.37**	1		
PS	8.78	1.01	-	.04	.16**	.18**	.09	.15**	.20**	.14**	.05	.26**	.31**	.18**	.20**	-.19**	-.15**	-.12**	1	

** . $p < .01$, * $p < .05$.

EX – Extraversion, CO – Conscientiousness, AG – Agreeableness, SE – Emotional stability, AU – Autonomy, ST – Study strategies, LN – Taking notes and listening skills, CI – Reading and comprehension strategies, SC – Writing and research skills, TE – Tests strategies, OM – techniques, OT – Time Organizing management, MS – Low academic motivation, AT – Test anxiety, DC – Attention difficulties, PS – School performance.

Hypotheses testing

H1. Personality is a significant predictor of school performance.

H1a. Extraversion is a significant positive predictor of school performance.

H1b. Emotional stability is a significant positive predictor of school performance.

H1c. Pleasantness is a significant positive predictor of school performance.

H1d. Conscientiousness is a significant positive predictor of school performance.

H1e. Openness is a significant positive predictor of school performance.

In order to test these hypotheses, a multiple linear regression analysis was performed, having as predictors the five personality factors and as a dependent variable school performance.

Table 2. Multiple linear regression analysis for personality as a predictor of school performance

Model	Unstandardized coefficients		Standardized coefficients		t	Sig.	95.0% CI	
	B	SE	β				Lower	Upper
EXT	-.01	.01	-.01		-.22	.83	-.01	.01
CON	.01	.01	.03		.53	.60	-.01	.01
AGR	.01	.01	.16		2.98	.01	.01	.02
STE	.01	.01	.03		.52	.60	-.01	.01
AUT	.01	.01	.11		1.99	.05	.01	.02

Dependent variable: School performance

$R^2 = .05$

It is observed that the five personality factors are responsible for only 5% of the variation of students' school performance, the regression equation being statistically significant, $F(5, 493) = 4.89$, $p < .01$. Of the five factors, only two are significant positive predictors of school performance, namely agreeableness, $\beta = .16$, $t(499) = 2.98$, $CI95\%(.01, .02)$, $p < .01$ and autonomy, $\beta = .11$, $t(499) = 1.99$, $CI95\%(.01, .02)$, $p < .05$.

These results lead us to state that hypothesis H1 is only partially supported by the analyzed data.

H2. *Learning strategies mediate the relationship between personality and academic performance.*

In order to test this hypothesis, a series of mediation analyzes were performed having as predictors the five personality factors (alternative), as mediating variables the ten learning strategies (alternative) and as a dependent variable school performance.

Table 3. *Indirect effects personality - learning strategies - school performance*

Indirect effects			95% CI		β	z	p	%	
IV	MV	DV	SE	Lower					Upper
EX	CI	PS	.01	.00	.01	.01	3.16	.00	92.75
EX	LN	PS	.01	.00	.01	.01	2.17	.03	44.28
EX	SC	PS	.01	.00	.01	.01	3.19	.00	96.50
EX	TE	PS	.01	.00	.01	.01	2.75	.01	96.73
EX	OM	PS	.01	.00	.01	.01	2.43	.02	56.95
EX	OT	PS	.01	.00	.01	.01	2.94	.00	80.70
EX	MO	PS	.01	.00	.01	.01	2.40	.02	58.14
EX	AT	PS	.01	.00	.01	.01	2.92	.00	92.41
CO	ST	PS	.01	.00	.01	.01	3.24	.00	40.01
CO	SC	PS	.01	.00	.01	.01	4.38	.00	52.37
CO	TE	PS	.01	.01	.02	.01	5.68	.00	98.10
CO	OM	PS	.01	.00	.01	.01	2.71	.01	39.05
CO	OT	PS	.01	.00	.01	.01	3.11	.00	44.72
CO	MS	PS	.01	.00	.01	.01	3.11	.00	40.64
CO	AT	PS	.01	.00	.01	.01	2.40	.02	15.55
AG	ST	PS	.01	.00	.01	.01	3.14	.00	26.01
AG	SC	PS	.01	.00	.01	.01	4.16	.00	39.35
AG	TE	PS	.01	.00	.01	.01	5.03	.00	56.26
AG	OM	PS	.01	.00	.01	.01	2.76	.01	23.34
AG	OT	PS	.01	.00	.01	.01	2.96	.00	19.81
AG	MS	PS	.01	.00	.01	.01	3.03	.00	27.22
SE	ST	PS	.01	.00	.01	.01	3.55	.00	61.86
SE	LN	PS	.01	.00	.01	.01	2.32	.02	24.46
SE	CI	PS	.01	.00	.01	.01	3.80	.00	60.66
SE	TE	PS	.01	.00	.01	.01	4.90	.00	98.68
SE	OM	PS	.01	.00	.01	.01	2.87	.00	35.44
SE	OT	PS	.01	.00	.01	.01	2.95	.00	36.71
AU	ST	PS	.01	.00	.01	.01	3.22	.00	38.15
AU	LN	PS	.01	.00	.01	.01	1.99	.04	14.28
AU	SC	PS	.01	.00	.01	.01	3.78	.00	50.68
AU	TE	PS	.01	.00	.01	.01	4.26	.00	64.88
AU	OM	PS	.01	.00	.01	.01	2.72	.01	26.56
AU	OT	PS	.01	.00	.01	.01	2.91	.00	30.20
AU	AT	PS	.01	.00	.01	.01	2.67	.01	34.63

EX – Extraversion, CO – Conscientiousness, AG – Agreeableness, SE – Emotional stability, AU – Autonomy, ST – Study strategies, LN – Taking notes and listening skills, CI – Reading and comprehension strategies, SC – Writing and research skills, TE – Tests strategies, OM – Organizing techniques, OT – Time management, MS – Low academic motivation, AT – Test anxiety, DC – Attention difficulties, PS – School performance.

It can be seen that there are mediating effects exerted by learning strategies even if there is no significant direct association between personality factors and school performance.

For extraversion, with the exception of study strategies, all other strategies are mediators, weak but significant. Thus, for tests strategies, the mediation percentage is 96.73%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.75$, $p < .05$, for writing and research skills the mediation percentage is 96.50%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.19$, $p < .01$, for reading and comprehension strategies the mediation percentage is 92.75%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.16$, $p < .01$, for time management the mediation percentage is 80.70%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.94$, $p < .01$, for organizing techniques the mediation percentage is 56.95%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.43$, $p < .05$, and for taking notes and listening skills the mediation percentage is 44.28%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.17$, $p < .05$. Regarding the weaknesses included in the learning strategies, for test anxiety the mediation percentage is 92.41%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.92$, $p < .01$, and for low academic motivation the mediation percentage is 58.14%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.40$, $p < .05$. Attention difficulties do not mediate the relationship between extraversion and school performance.

For conscientiousness, taking notes and listening skills, as well as reading and comprehension strategies do not mediate the relationship between it and school performance, but for tests strategies the mediation percentage is 98.10%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.24$, $p < .01$, for writing and research skills the mediation percentage is 52.37%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 4.38$, $p < .01$, for time management the mediation percentage is 44.72%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.11$, $p < .01$, for study strategies the mediation percentage is 40.01%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.24$, $p < .01$, for organizing techniques the mediation percentage is 39.05%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.71$, $p < .05$. Regarding the weaknesses included in learning strategies, for low academic motivation the mediation percentage is 40.64%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.11$, $p < .01$, and for test anxiety the mediation percentage is 15.55%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.40$, $p < .05$. Attention difficulties do not mediate the relationship between conscientiousness and school performance.

For agreeableness, taking notes and listening skills, as well as reading and comprehension strategies do not mediate the relationship between it and school performance, but for tests strategies the mediation percentage is 56.26%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 5.03$, $p < .01$, for writing and

research skills the mediation percentage is 39.35%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 4.16$, $p < .01$, for study strategies the mediation percentage is 26.01%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.14$, $p < .01$, for organizing techniques the mediation percentage is 23.34%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.76$, $p < .05$, and for time management the mediation percentage is 19.81%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.96$, $p < .01$.

Regarding the weaknesses included in the learning strategies, for low academic motivation the mediation percentage is 27.72%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.03$, $p < .01$. Test anxiety and attention difficulties do not mediate the relationship between agreeableness and school performance.

For emotional stability, writing and research skills do not mediate the relationship between it and school performance, but for tests strategies the mediation percentage is 98.68%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 4.90$, $p < .01$, for study strategies the mediation percentage is 61.86%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.55$, $p < .01$, for reading and comprehension strategies the mediation percentage is 60.66%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.80$, $p < .01$, for time management the mediation percentage is 36.71%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.95$, $p < .01$, for organizing techniques the mediation percentage is 35.44%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.87$, $p < .05$, and for taking notes and listening skills the mediation percentage is 24.46%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.32$, $p < .05$. Regarding the weaknesses included in the learning strategies, none of the three mediate the relationship between emotional stability and school performance.

For autonomy, reading and comprehension strategies do not mediate the relationship between it and school performance, but for tests strategies the mediation percentage is 64.88%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 4.26$, $p < .01$, for writing and research skills the mediation percentage is 50.68%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.78$, $p < .01$, for study strategies the mediation percentage is 38.15%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 3.22$, $p < .01$, for time management the mediation percentage is 30.20%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.91$, $p < .01$, for organizing techniques the mediation percentage is 26.56%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.72$, $p < .05$, and for taking notes and listening skills the mediation percentage is 14.28%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 1.99$, $p < .05$. Regarding the weaknesses included in the learning strategies, for test anxiety the mediation percentage is 34.63%, $\beta = .01$, $CI95\%(.00, .01)$, $z = 2.67$, $p < .05$. Low academic motivation and attention difficulties do not mediate the relationship between autonomy and school performance.

Table 4. Direct effects personality – learning strategies

VI	VD	ES	95% CI		β	z	p
			Min.	Max.			
EX	ST	.03	.07	.17	.12	4.49	.00
EX	LN	.03	.03	.14	.09	3.09	.00
EX	CI	.02	.07	.15	.11	5.08	.00
EX	SC	.02	.03	.10	.07	3.76	.00
EX	TE	.02	.03	.12	.07	2.96	.00
EX	OM	.02	.03	.11	.07	3.07	.00
EX	OT	.03	.05	.15	.10	3.98	.00
EX	MO	.03	-.13	-.02	-.07	-2.88	.00
EX	AT	.03	-.27	-.13	-.20	-5.86	.00
CO	ST	.02	.18	.27	.22	9.19	.00
CO	LN	.02	.24	.33	.28	11.65	.00
CO	CI	.02	.12	.20	.16	7.82	.00
CO	SC	.02	.10	.17	.14	8.13	.00
CO	TE	.02	.23	.32	.27	12.57	.00
CO	OM	.02	.18	.26	.22	11.07	.00
CO	OT	.02	.21	.30	.25	10.97	.00
CO	MS	.02	-.28	-.19	-.23	-9.85	.00
CO	AT	.03	-.21	-.08	-.15	-4.23	.00
CO	DC	.02	-.30	-.21	-.25	-10.64	.00
AG	ST	.03	.13	.23	.18	6.75	.00
AG	LN	.03	.17	.28	.23	8.26	.00
AG	CI	.02	.07	.15	.11	4.84	.00
AG	SC	.02	.10	.17	.13	7.17	.00
AG	TE	.02	.16	.26	.21	8.44	.00
AG	OM	.02	.12	.21	.16	7.14	.00
AG	OT	.03	.08	.18	.13	4.91	.00
AG	MS	.03	-.25	-.15	-.20	-7.53	.00
AG	DC	.03	-.24	-.13	-.18	-6.94	.00
SE	ST	.04	.19	.33	.26	7.14	.00
SE	LN	.04	.08	.23	.16	4.05	.00
SE	CI	.03	.08	.20	.14	4.43	.00
SE	SC	.03	.08	.18	.13	5.04	.00
SE	TE	.03	.17	.30	.23	6.85	.00
SE	OM	.03	.08	.20	.14	4.48	.00
SE	OT	.04	.08	.22	.15	4.18	.00
SE	AT	.05	.01	.21	.11	2.20	.03
AU	ST	.03	.10	.23	.17	5.23	.00
AU	LN	.03	.03	.16	.09	2.75	.01
AU	CI	.03	.09	.20	.14	5.44	.00
AU	SC	.02	.07	.15	.11	5.06	.00
AU	TE	.03	.10	.22	.16	5.41	.00
AU	OM	.03	.06	.16	.11	4.02	.00
AU	OT	.03	.07	.19	.13	4.14	.00
AU	MS	.03	-.13	-.01	-.07	-2.10	.04
AU	AT	.04	-.36	-.19	-.28	-6.59	.00

EX – Extraversion, CO – Conscientiousness, AG – Agreeableness, SE – Emotional stability, AU – Autonomy, ST – Study strategies, LN – Taking notes and listening skills, CI – Reading and comprehension strategies, SC – Writing and research skills, TE – Tests strategies, OM – Organizing techniques, OT – Time management, MS – Low academic motivation, AT – Test anxiety, DC – Attention difficulties.

In terms of the direct associations between personality factors and learning strategies, they are mostly significant.

For extraversion, all seven strategies are positively associated with it. Thus, for study strategies, $\beta = .12$,

CI95%(.07, .17), $z = 4.49$, $p < .01$, for taking notes and listening skills, $\beta = .09$, CI95%(.03, .14), $z = 3.09$, $p < .01$, for reading and comprehension strategies, $\beta = .11$, CI95%(.07, .15), $z = 5.08$, $p < .01$, for writing and research skills, $\beta = .07$, CI95%(.03, .10), $z = 3.76$, $p < .01$, for tests strategies, $\beta = .07$, CI95%(.03, .12), $z = 2.96$, $p < .01$, for organizing techniques, $\beta = .07$, CI95%(.03, .11), $z = 3.07$, $p < .01$, and for time management, $\beta = .10$, CI95% (.05, .15), $z = 3.98$, $p < .01$. Regarding the weaknesses included in the learning strategies, for low academic motivation, $\beta = -.07$, CI95%(-.13, -.02), $z = -2.88$, $p < .01$, for test anxiety, $\beta = -.20$, CI95%(-.27, -.13), $z = -5.86$, $p < .01$, and attention difficulties are not associated with extraversion.

For conscientiousness, all seven strategies are positively associated with it. Thus, for study strategies, $\beta = .22$, CI95%(.18, .27), $z = 9.19$, $p < .01$, for taking notes and listening skills, $\beta = .28$, CI95%(.24, .33), $z = 11.65$, $p < .01$, for reading and comprehension strategies, $\beta = .16$, CI95%(.12, .20), $z = 7.82$, $p < .01$, for writing and research skills, $\beta = .14$, CI95%(.10, .17), $z = 8.13$, $p < .01$, for tests strategies, $\beta = .27$, CI95%(.23, .32), $z = 12.57$, $p < .01$, for organizing techniques, $\beta = .22$, CI95%(.18, .26), $z = 11.07$, $p < .01$, and for time management, $\beta = .25$, CI95%(.21, .30), $z = 10.97$, $p < .01$. Regarding the weaknesses included in the learning strategies, for low academic motivation, $\beta = -.23$, CI95% -.28, -.19), $z = -9.85$, $p < .01$, for test anxiety, $\beta = -.15$, CI95%(-.21, -.08), $z = -4.23$, $p < .01$, and for attention difficulties $\beta = -.25$, CI95%(-.30, -.21), $z = -10.64$, $p < .01$.

For agreeableness, all seven learning strategies are positively associated with it. Thus, for study strategies, $\beta = .18$, CI95%(.13, .23), $z = 6.75$, $p < .01$, for taking notes and listening skills, $\beta = .23$, CI95%(.17, .28), $z = 8.26$, $p < .01$, for reading and comprehension strategies, $\beta = .11$, CI95%(.07, .15), $z = 4.84$, $p < .01$, for writing and research skills, $\beta = .13$, CI95%(.10, .17), $z = 7.17$, $p < .01$, for tests strategies, $\beta = .21$, CI95%(.16, .26), $z = 8.44$, $p < .01$, for organizing techniques, $\beta = .16$, CI95%(.12, .21), $z = 7.14$, $p < .01$, and

for time management, $\beta = .13$, CI95%(.08, .18), $z = 4.91$, $p < .01$. Regarding the weaknesses included in the learning strategies, for low academic motivation, $\beta = -.20$, CI95%(-.25, -.15), $z = -7.53$, $p < .01$, for attention difficulties, $\beta = -.18$, CI95%(-.24, -.13), $z = -6.94$, $p < .01$. Test anxiety is not significantly associated with agreeableness.

For emotional stability, all seven strategies are positively associated with it. Thus, for study strategies, $\beta = .26$, CI95%(.19, .33), $z = 7.14$, $p < .01$, for taking notes and listening skills, $\beta = .16$, CI95%(.08, .23), $z = 4.05$, $p < .01$, for reading and comprehension strategies, $\beta = .14$, CI95%(.08, .20), $z = 4.43$, $p < .01$, for writing and research skills, $\beta = .13$, CI95%(.08, .18), $z = 5.04$, $p < .01$, for tests strategies, $\beta = .23$, CI95%(.17, .30), $z = 6.85$, $p < .01$, for organizing techniques, $\beta = .14$, CI95%(.08, .20), $z = 4.48$, $p < .01$, and for time management, $\beta = .15$, CI95%(.08, .22), $z = 4.18$, $p < .01$. Regarding the weaknesses included in the learning strategies, for test anxiety, $\beta = .11$, CI95%(.01, .21), $z = 2.20$, $p < .05$. Low academic motivation and attention difficulties are not significantly associated with emotional stability.

For autonomy, all seven strategies are positively associated with it. Thus, for study strategies, $\beta = .17$, CI95%(.10, .23), $z = 5.23$, $p < .01$, for taking notes and listening skills, $\beta = .09$, CI95%(.03, .16), $z = 2.75$, $p < .01$, for reading and comprehension strategies, $\beta = .14$, CI95%(.09, .20), $z = 5.44$, $p < .01$, for writing and research skills, $\beta = .11$, CI95%(.07, .15), $z = 5.06$, $p < .01$, for tests strategies, $\beta = .16$, CI95%(.10, .22), $z = 5.41$, $p < .01$, for organizing techniques, $\beta = .11$, CI95%(.06, .16), $z = 5.41$, $p < .01$, and for time management, $\beta = .13$, CI95%(.07, .19), $z = 4.14$, $p < .01$. Regarding the weaknesses included in the learning strategies, for low academic motivation, $\beta = -.07$, CI95%(-.13, -.01), $z = -2.10$, $p < .01$, for test anxiety, $\beta = -.28$, CI95%(-.36, -.19), $z = -6.59$, $p < .01$. Attention difficulties are not significantly associated with autonomy.

Table 5. *The direct effects of learning strategies on school performance*

IV	DV	SE	95% CI		β	z	p
			Lower	Upper			
ST	PS	.01	.01	.04	.03	4.44	.00
LN	PS	.01	.01	.03	.02	3.05	.00
SC	PS	.01	.03	.07	.05	6.03	.00
TE	PS	.01	.03	.05	.04	7.27	.00
OM	PS	.01	.01	.04	.03	3.97	.00
OT	PS	.01	.01	.04	.03	4.36	.00
MO	PS	.01	-.04	-.01	-.02	-4.33	.00
AT	PS	.01	-.02	-.01	-.01	-3.36	.00
DC	PS	.01	-.03	-.00	-.01	-2.54	.01

ST – Study strategies, LN – Taking notes and listening skills, CI – Reading and comprehension strategies, SC – Writing and research skills, TE – Tests strategies, OM – Organizing techniques, OT – Time management, MS – Low academic motivation, AT – Test anxiety, DC – Attention difficulties, SP – School performance

Regarding the direct associations between learning strategies and school performance, with the exception of reading and comprehension strategies, all the others are positively associated with school performance, and the three weaknesses included in the learning strategies are negatively associated with it. Thus, for study strategies, $\beta = .03$, CI95%(.01, .04), $z = 4.44$, $p < .01$, for taking notes and listening skills, $\beta = .02$, CI95%(.01, .03), $z = 3.05$, $p < .01$, for writing and research skills, $\beta = .05$, CI95%(.03, .07), $z =$

6.03 , $p < .01$, for tests strategies, $\beta = .04$, CI95%(.03, .05), $z = 7.27$, $p < .01$, for organizing techniques, $\beta = .03$, CI95%(.01, .04), $z = 3.97$, $p < .01$, and for time management, $\beta = .03$, CI95%(.01, .04), $z = 4.36$, $p < .01$. Regarding the weaknesses included in the learning strategies, for low academic motivation, $\beta = -.02$, CI95%(-.04, -.01), $z = -4.33$, $p < .01$, for attention difficulties, $\beta = -.01$, CI95%(-.03, -.01), $z = -2.54$, $p < .01$. Test anxiety is not significantly associated with school performance.

4. DISCUSSION

The aim of this study was to analyze the relationships between Big Five personality factors, learning strategies, including weaknesses, and school performance.

The descriptive statistics showed that students had high levels of conscientiousness, agreeableness and autonomy. In terms of school performance, the overall average grades reported in this study were very high. The learning strategies used by students can complement the image of generation Z teenagers, their preferences for choosing specific strategies over others being specific to the digital generation. Thus, the most used strategy proved to be taking notes and listening, followed by study strategies, tests strategies and time management. The least widely used strategies were writing and research skills, reading and comprehension strategies.

These results show not only the preferences of adolescents for the learning approach, but also the models that are imposed on them during the teaching-learning process. Taking notes and listening is the main form of interaction with the teacher who teaches, so students are accustomed to noting at least the main ideas from the content taught and listening to the teacher's explanations. Study strategies and those applied to evaluation situations are skills that students have developed over time and that have obviously brought them success. Time management is a skill acquired as a result of long experience of a large volume of learning materials or as a result of their ability to prioritize school-related activities. Among the least preferred strategies, writing and reading seem to be the most common. It is well known that today's teenagers prefer to find their information in the virtual environment, on the Internet, where it is easily accessible, without requiring increased effort on their part. At the same time, organizing techniques is not part of the students' preferences, perhaps due to the fact that usually the learning materials are already organized by the teacher and divided into chapters or learning modules.

The hypotheses of the study tried to test the relationships that are established between personality factors, learning strategies and school performance. It was observed that only agreeableness and autonomy are significantly and positively associated with school performance. To our surprise, conscientiousness does not correlate with school

performance, as we would have expected. This result can be attributed to the fact that the school success of adolescents is not based exclusively on learning, but rather on creative ways of solving problems, specific to autonomy, the search for effective solutions and confidence in their own abilities. Agreeableness also has an increased dose of trust, with adolescents who consider themselves agreeable being more popular, more confident, having a richer social network and a greater openness to novelty and relationships.

The five personality factors, on the other hand, have significant associations with all learning strategies, including the weaknesses. Extraversion is most strongly associated with study strategies and reading and comprehension strategies, but also with time management. This result can be determined by the fact that extroverted people, being more open to the world, to the others, need to build a credible image, they need to have information to use it in social contexts. Extroverted students have a lot of knowledge, a rich and diverse social network, they actively participate in joint actions, so they have to manage their time extremely judiciously to cope with all their tasks and social roles. At the same time, extraversion is negatively associated with low motivation and test anxiety, but not with attention difficulties. Extroverted students have a high level of motivation, because this is the source of their success, and in the absence of success, their popularity may suffer. They need to get good results, not only to gain knowledge in one field or another, but also to show that they deserve a place in the groups and community they belong to. Similarly, test anxiety tends to be lower among extroverted adolescents. They are unfamiliar with anxiety in general. They value themselves precisely by the absence of any form of concern, by the relaxation and ease with which they cope with different social contexts, including those in school and learning.

Conscientiousness is most positively associated with tests strategies, with the ability to take notes and listen, with organizing techniques, but also with the rest of the strengths included in learning strategies. Although it has been observed that it is not directly associated with school success, conscientiousness has a close relationship with these strategies, which it facilitates and directs, so that they can later lead to performance. Conscientious students focus

- during the assessments - on eliminating the improbable variants and on allocating the working time according to the difficulty of the items, thus managing the exam situations much better. Our data could allow us to formulate the idea that conscientious students are able to identify themselves with the assessment process and take it seriously. They will focus on refining and using specific learning strategies, associated with the ability to distinguish between important and irrelevant information, which can lead to optimizing the learning process.

It seems that conscientious students have specific strategies, used to organize the materials to be learned, ranging from preparing for each class to writing homework and will be able to better organize their activities, including in the field of learning. We could also draw the idea that conscientious students are more easily able to classify and order tasks, to organize their specific learning actions much better. A conscientious student seems to be able to demonstrate that he has mastered certain information and developed certain organizing skills, to a greater extent than a student who has approached the contents in a superficial, unconstrained manner, in a disorganized way, without an approach through prospective thinking. It seems that the first of them will have more chances to successfully face the evaluations than they who does not show conscientiousness. At the same time, based on these results, we can consider that conscientious students are able to use metacognitive techniques more easily, such as time management, which involves recognizing the most effective ways to use the time available for learning.

From a psychological point of view, the negative correlation between conscientiousness and low academic motivation leads us to the conclusion that conscientious students are also motivated to perform. Motivation reflects a student's investment in the learning process, influencing the choice of certain learning strategies and the effort made to use them. Since conscientiousness is not associated with a low level of motivation, which could lead students to the impossibility of overcoming tasks with a high level of difficulty, we can consider that conscientious students are more likely to achieve "motivational optimum". The fact that conscientiousness is not associated with attention difficulties indicates that conscientious students can better focus on the tasks received, can show a constant focus on learning, unlike those who are not characterized by conscientiousness. Based on the aspects presented, we can consider that students who obtain results that indicate the presence of conscientiousness will not be exposed to major difficulties in terms of attention. A student must first be attentive in order to be able to learn, and a conscientious student will have these conditions assured to a greater extent than the others.

Agreeableness is positively associated with learning strategies, most strongly with test strategies and the ability

to take notes and listen. Agreeable (kind) students are characterized by attentive behavior to those around them, but also to themselves, they are willing to help their classmates and get involved in team tasks. As a result, they can achieve success in group assessment situations, by organizing the team, but also by organizing the fragments / items depending on the degree of difficulty or their importance in the test. Agreeable students are also among those who offer their notebooks to their classmates to complete their insufficient grades or incorrect homework, so taking notes can be a strategy to get closer to others, but also to consolidate their knowledge in order to become a reliable source of information and help for others. Agreeable students do not have a decrease in motivation or attention difficulties, which can be explained by the same idea of their tendency to maintain an impeccable image. Agreeableness means positive exposure, self-help, kindness, so an agreeable student must always be present and careful not to tarnish his image and to achieve success that makes him credible in front of others.

Emotional stability is most strongly associated with study and research strategies and tests strategies. Emotionally balanced students have self-confidence that gives them self-efficacy, work at their own pace, without being pressured by the environment or others, they are confident that the strategies they adopt will lead to success. Even test anxiety is positively associated with emotional stability, which can be based on the same confidence in themselves and on their own strengths, with emotionally stable students being able to select positively and perceive stress as an activating factor in assessment situations. Emotional stability has the ability to predict the study strategies used by students to successfully cope with educational tasks and not only, and may indicate the regular use of mnemonics and other memory mechanisms used by them in the context of learning and the contribution of significant emotional stability in developing the ability to encode and extract information.

In essence, emotional stability requires balance, and balance clarifies and crystallizes goals as well as the ways to achieve them. Thus, the emotionally stable students will be the reference pillars of the class, the model according to which the other colleagues can orient themselves, they usually obtain higher results, if not brilliant in most school assignments.

Autonomy is significantly associated primarily with reading and research skills and tests strategies, but also with other learning strategies. The fact that reading is associated with autonomy is the very answer of the Z generation to the act of learning. Adolescents must reach a certain level of autonomy in order to be able to understand the purpose and role of reading and research in learning and implicitly in school success, having more self-confidence, greater trust in exposure to new situations, teaching-learning and even assessment contexts. Thus, students

characterized by autonomy adopt that type of strategy considered to be the most important, logical learning, based on understanding, having the greatest opportunities to transfer content to long-term memory and facilitate, implicitly, the durability of this process. Autonomous students are not concerned with learning for a short time, possibly until the time of assessment, but with long-term learning, even for life, focusing on deep, authentic and not superficial learning, in order to obtain a good grade strictly at evaluation date, but to succeed consistently. Thus, the study indicated that autonomous students will focus on reading content indicated by teachers and on understanding it in depth. At the same time, the results could indicate the possibility for students characterized by autonomy to focus on understanding the aspects that ensure their knowledge of reality.

At the same time, autonomous students also focus on capitalizing on learning strategies considered strengths, namely writing and research skills, and their ease facilitates their training in complex activities, such as research and discovery of new information. Thus, the data indicate that students characterized by autonomy will also develop the ability to gather information from a variety of sources, develop an organized plan, integrate ideas, review materials, and complete research tasks increasingly complex. Also, the findings lead us to the idea that students who report a high level of autonomy, will focus on probing and capitalizing of the new and important issues, found in the various sources of information accessed.

Regarding the association between learning strategies and school performance, the strongest positive association was observed with tests strategies and with writing and research skills. Taking notes and organizing techniques were associated to a lesser extent with school performance. Also, low academic motivation, test anxiety, and attention difficulties are negatively associated with school performance. These results reinforce the opinions of specialists regarding the importance of personal factors in achieving school success. Learning strategies are active behaviors approached by students in their attempt to deepen learning materials. These contain volitional, motivational, attentional components, but also skills and abilities developed as a result of participating in training activities. It is natural for each strategy, taken separately, to contribute to school success, because these strategies are themselves the result of selections made by students as a result of previous successes achieved during the school years.

Despite the relative absence of direct relationships between personality factors and school success, however, there were mediation relationships through learning strategies. They come and compensate in one form or another what personality factors fail to fully accomplish. Personality is the foundation, the starting point in the choice

of learning strategies by students to the detriment of others, and the chosen strategies lead to success and school performance. Results similar to ours have been obtained by other authors. For example, Lounsbury et al. (in press) found that the strongest correlations between personality factors and school performance were reported for agreeableness, openness and only then for conscientiousness.

Similarly, Tett et al. (1991), in a meta-analysis, found that agreeableness is a strong predictor of performance. The result may also be due to the fact that people with high levels of agreeableness have a greater preference for teamwork and group tasks, which can lead to academic success. At the same time, the agreeableness brings efficiency in the training process, the frequent acquisition of new skills and concepts being facilitated by the cooperative efforts of the students. Autonomy, the opening equivalent of the Big Five model, as in our study, was correlated with school performance, unlike many other studies that have obtained inconclusive results in this regard. The explanation probably lies in the fact that autonomy or openness includes the desire to learn and experience new situations, curiosity and independence in learning, the freedom to choose what and how and when to learn (Bing & Lounsbury, 2000).

Nabizadeh et al. (2019) found similar results in a study on the relationship between student learning strategies and academic performance. A review of the literature also showed that learning strategies are associated with academic achievement and success among medical students (Cho et al., 2017). Cenicerros (2009) showed that learning strategies are positively associated with school performance, as did Martin et al. (2008) or Valle et al. (2009).

Conclusions

The present study draws attention to some of the factors that contribute to the academic success of adolescents. It reflects only some of the factors involved in the personality-school performance equation, but it does show that learning strategies adopted by students are determinants of school success. These strategies are nothing more than a means of approaching learning, some of them innate (attention to detail, interest in reading, time orientation and time management, activation of motivation, attention, predisposition to anxiety), others acquired over time, through practice and training (writing and research skills, reading and comprehension strategies, general study skills, organization of learning material).

The teacher is one of the important factors, as a role model, but also as a facilitator of learning. The pace and style of learning that impresses students becomes essential in shaping their learning habits. A teaching style aimed at the monotonous delivery of content to a group of students who passively absorb information will imprint unhealthy learning patterns on them. These students will address incomplete and ineffective learning strategies. A student-

oriented teaching style will lead not only to good learning, but also to the adoption of effective learning strategies.

According to the model of self-regulated learning, the selection of learning strategies is determined not only by external factors, but also by internal ones. Students choose tactics and strategies based on previous experiences, available materials, instructional indicators, but also based on motivation, beliefs and personal goals. Examining their learning outcomes, students reflect on their own performance and the effectiveness of the strategies approached, so that they constantly update their criteria and select strategies.

The teenagers we analyzed are among the best students of the high schools they are enrolled in and therefore their performance has been high. The choice of this group of students was not accidental, our intention being to find out how they "work" and extract their essential features, in order to develop a portrait of the student "hardworking", eager to learn and achieve high performance. Personality traits have not proven to be consistent predictors of school performance, and this result can also be attributed to the fact that in adolescence the personality is not fully consolidated. However, personality factors are associated with students' learning strategies, which explains the reported individual differences in learning. In turn, learning strategies are associated with school success, leading to different outcomes, depending on the intensity at which they are used.

We have to note that the least used strategies of teenagers are writing and reading, which raises an alarm signal that must be heard by teachers and those who develop instructional policies. Maybe Generation Z needs a change not in learning strategies, but in teaching, content and information delivery strategies. Perhaps the content should be updated more often and delivered in a more engaging, interactive, applicable way. It is true that more emotionally stable students achieve better school results, as do those who are conscientious or self-reliant, but perhaps their efforts to achieve performance are higher than normal. They may be easily adaptable, but what about the less flexible ones? And there are many. How can teaching be adapted to the level of understanding of digital students? How can the non-digital teacher approach these students? How can the information be structured so that it can be delivered in optimal conditions and with a high chance of being fully received? All these questions can be answered when the teaching will be student-centered, when what is called teaching for learning will take place.

Practical implications

Beyond obtaining an overview of the particularities of adolescents who achieve high school results, the results of this study can be starting points in the development and implementation of psychoeducational programs through

which students learn how to learn. Many times, they face situations in which they do not know how to approach a certain discipline, they do not know how much time to devote to learning, they do not know how to organize their materials and how to select them. Adapting the contents, delivering them according to the individual characteristics of the students, providing quality and constructive feedback, reflecting on what they have learned, dividing the contents into more numerous and smaller modules, all these could be directions for developing programs addressed to teachers.

Another important aspect is the real knowledge of the students. This task is the responsibility of the school counselor or teachers. The identification of learning strategies, vocational interests, skills and talents of students becomes imperative not only for obtaining high school results, but also for career guidance and admission to the fittest faculty. Rarely do parents turn to a vocational counselor on their own initiative and for this reason students find themselves disoriented and unguided in the process of selecting a faculty to fulfill their vocation. Teachers who interact with students can make psycho-pedagogical assessment reports from which to draw a series of conclusions about students' subsequent career decisions. All these steps will lead not only to support students in their decisions, but also to give a substantial interest to their needs during adolescence. They will notice this involvement, will be considered as valued by the authorities (teachers) and will contribute personally, perhaps more than before to their own personal growth and development.

Courses for teachers could include elements related to intergenerational differences, how adolescents process information, the multitasking model they approach, the speed with which they want learning to occur. It could also include elements related to educational psychology, the principles of socio-emotional learning and those of positive psychology.

Limitations and future directions of research

One of the limitations of this study is that the participants were students enrolled in high school in one single county of the country. In our future studies we will consider expanding research in other parts of the country, but also in rural areas, where the situation of students may be completely different, many of them lacking the resources needed for quality learning. Another limitation is the use of an instrument evaluating learning strategies with a very large number of items, as well as for assessing personality. We will consider using a more concise instrument in the future so that there is no risk of students losing their patience while completing it. We also aim to analyze the intensity, frequency and cumulation of learning strategies in our future studies. Some students may use one strategy more intensely and more frequently, while others may use a different strategy or a different number of learning strategies.

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