



# Personality Predictors of Azerbaijani Pupils' and Students' Academic Achievements

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## Abstract.

Implicit theories of personality and intelligence, goal orientations as well as Big-Five Personality Traits constitute an important part of the complex system of personality predictors of academic achievement. 77 pupils and 70 students participated in the study. The Implicit Theories Inventory and Ten Item Personality Measure (TIPI) were utilized to find which factors influence academic success in Azerbaijani schools and universities. A strong positive correlation was found between learning performance, mastery goals and academic self-concept with academic achievement among the student sample. Although no correlation was found with the big five traits, regression analysis demonstrated that big five indicators such as lower scores of agreeableness and neuroticism make a significant contribution to academic performance. These results confirm that students who value the learning process and believe that intelligence is a developmental phenomenon tend to achieve great success in their studies. It also explains that non-impulsive, non-sensitive students who are ready for discussions and critical assessments are more successful learners. Furthermore, these personal indicators not being predictors of pupils' achievements shows that they are formed with age and within specific social contexts.

**Keywords:** academic achievement, education success rate, five factor model, implicit theories of intelligence and personality, personality traits.

## 1. Introduction

The research topic's relevance is caused by the increase of public interest in the students' full implementation of the intellectual and personal potential, as long as it might be a source of their success, achievements, and above all – development.

By studying and identifying predictors that contribute to pupils' and students' academic achievement we can help with its enhancement at local schools and universities, and what is more this may advance them in the direction of finding themselves and improvement in future life, including career.

Evaluation and achievements in education will always be important therefore the consideration of personal prerequisites on success of educational activity can be treated as one of the educational psychology's central challenges today.

The aim of research is finding out the factors that will influence on the education success in the Azerbaijani schools and universities.



People's implicit beliefs about flexibility or stability of intelligence and personality make substantial effect emotional and academic outcomes (Aronson et al., 2002; Burnette et al., 2013; Romero et al., 2014).

Due to involvement of IT in learning processes regulation in order with other factors of the combined personality and intellectual potential (Kornilova et al., 2010), it is mandatory to investigate how they concern to other features that have proven to be predictors of prosperous learning. We have already conducted a cross-cultural study where compared Implicit theories of personality and intelligence as an important part of the complex system of personality predictors of academic achievement in Russian and Azerbaijani students where we established the cross-cultural invariance of the factorial structure for Implicit Theories Inventory in Russian and Azerbaijani students samples (Kornilova, Chumakova, Izmailova, 2015).

Current study was conducted in order to compare pupils' and students' Implicit theories impact on their academic achievement, as well as to establish additional predictors of students' performance from the co side influence of the Big Five factors (extroversion, agreeableness, consciousness, emotional stability, openness to experience). Despite identifying potential predictors of the students' learning success, it is necessary to analyze whether the same predictors will determine the academic achievement of pupils as well. The leading activity and social situation of development change during the transition from teenager to adolescence, which can eventually affect the restructure the predictors' system. Consequently, this study expands the understanding of personal regulation in learning success of Azerbaijanis.

In this study the student sample was compared with the pupil's for checking whether the students of the University not only acquire skills and knowledge, but also grow personally by integrating into a new system of relations, a new social situation of development, which differs from the school.

### **1.1 Implicit theories of intelligence and personality**

This line of research has identified individual differences in self-perception of intelligence as some – referred to as incremental theorists – view it as pliable, while others – named entity theorists – view it as defined (Dweck and Leggett 1988; Molden and Dweck 2006).

People with incremental theories mostly focus on learning and wish to expend more exertion to learn in comparison to people with entity theories (Mathur et al. 2012). Indeed, regarding to previous researches, incremental theorists compared to entity theorists have learning goals of enlarging their ability and exploit of any chance of growth. Incremental theorists are more likely to involve in learning goals with high possibility of making mistakes, while entity theorists are more prone to approach tasks with low possibility of failure and high guarantee of success (Dweck and Bempechat 1983).

Dweck mentioned in studies about influence of implicit theories of intelligence on framing education and life goals, and she noted that many individuals aspire performance goals that are oriented towards the result and they try to avoid failures, appreciate a positive self-esteem. Others choose mastery goals and focused on learning (Dweck, 2000). People with entity theory who perceive intelligence as something



permanent (quantitative) tend to be better than others in every field, avoid difficult tasks and escalate stress-free achievements (Ehrlinger et al. 2016). They easily doubt on their own intellectual potential when face to accomplishment of others and any kind of difficulties. Contrariwise obstacles on the way of people who distinguish fickle intelligence are perceived as challenges and opportunity to develop.

Therefore scientists wondered: which kind of relation there is between academic performance and implicit theories? After a large-scale study the authors came to the following conclusion: "the theory of incremented intelligence is positively related to the belief in the positive role of effort, learning objectives, low indices of helplessness' attribution and positive strategies» (Trzesniewski, Dweck, 2007).

Relation between implicit theories of intelligence and personality with students' academic performance, their emotional and academic intelligence was already studied in the Russian sample (Kornilova et al., 2008). If an individual has a high score on the increment intelligence scale, he will try more to control his learning progress (correlation with the "Self-esteem learning" scale). Other results on Russian variable suggest that, implicit theories are more related to personality than to intelligence, which is interesting since numerous studies have shown them playing a crucial role in the intelligence development (Zirenko, 2018).

Implicit theories daily included to in regulation of the student's activities at school and are manifested in the parent-child relationships. Implicit theories of intelligence have cultural boundaries. Adherence to different implicit theories characterizes personality as well. The study of implicit theories takes into account the age, sex, and group affiliation of a person.

Interesting results were obtained in study conducted on Kyrgyz students aged 16-17. As a result, pupils put more effort to achieve success in learning activities, therefore if they share the idea of increment intellect. These students are focused on achievement (the goal) and according to Heckhausen is the key in understanding the nature of the aspiration level, striving to increase the competence (Heckhausen, 2000). As result the adoption of learning objectives and self-assessment of learning was a necessary factor for achieving success and focus on the skills growing. In Kyrgyz students sample the self-assessment scale was a predictor of student performance (Ivanova et al., 2014). Ever since implicit theories of intelligence and personality are related to the efficiency of learning, it is necessary to raise the question about connections with other personal variables they are combined. First of all, it is interesting to see the connection with The big five, because these properties can also accompany the effectiveness of learning and reflect the involvement of the person to the processes of goal-setting and goal-achievement.

## 1.2 Big Five Personality Traits

Five-Factor model occupies a significant place among the modern dimensions of personality traits. Traditional designations are the following: N (neuroticism) , E (extraversion), O (openness to experience), A (agreeableness), C (conscientiousness). Development of the questionnaire TIPI - Ten Item Personality Inventory largely solved the problem of rapid diagnosis of abovementioned personal traits. A short questionnaire



TIPI – also called Very Brief Measure of the Big-Five Personality Traits - was developed By S. Gosling and his colleagues (Gosling, 2003).

There were approbations of the TIPI questionnaire in other languages-Russian (Sergeeva et al. 2016), German (Muck et al. 2007), Japanese (Oshio et al. 2012), Spanish (Romero et al. 2012) and we also did it in Azerbaijani (Zirenko et al.2017).

A sufficient number of studies on the relations of personal traits and academic achievements were conducted on different samples, acknowledgements to which makes possible to summarize the results after what find a certain consistency between them. Many researchers prophesy that academic performance is significantly related to two factors of the big five: Consciousness and Openness to experience (Poropat, 2009; Trapmann et al., 2007). This is explained by the fact that a successful student is careful and consistent, essentially follow a certain algorithm, must be able to gradually move towards the goal, regardless of obstacles and difficulties, meanwhile he must be curious and open to new ideas.

Study of O'connor and Paunonen (O'connor et al. 2007) revealed that only Consciousness and Openness to experience are significant predictors of academic achievement while Trapmann's meta-analysis adds Neuroticism to these factors, which they report as negatively related to education satisfaction (Trapmann et al., 2007).

The reason for such discrepancies in the aforementioned studies may lie in the particular samples. Conceivably this might be explained by differences in the requirements for psychological properties and characteristics of students having an impact on the learning process, which vary in different cultures and countries. In current study relation between academic performance and the psychological characteristics of Azerbaijani sample of students and pupils measured by the tools of The big five in the context of the peculiarities of the Azerbaijani education system is expected.

Numerous studies have shown that Neuroticism and Extroversion in adolescence period are higher and Consciousness is lower in comparison with people over 30 years (Costa, McCrae, 1994a).

In this study differences in the parameters of The big Five due to age (comparing samples of pupils and students) will be observed.

The following hypotheses were tested in study:

*H1:* High rates of incremental theories of intelligence and personality, along with the student's focus on the acquisition of skills, as well as its inherent properties of The big five are personal predictors of academic achievements.

*H2:* Predictors of academic performance between Azerbaijani pupils and students will vary. Students are expected by higher incremental theories, consciousness, integrity and openness to experience, as their education requires greater autonomy and self-organization.

The complementary aim was the identification of personal properties based on the big five and implicit theories, as predictors of academic achievements, all the while exploring differences between the established relationships of psychological variables in students and pupils. This paper thus also presents such an analysis.

## 2. Methods



## 2.1 Participants

For the first step of the study has been recruited 77 senior pupils (44 females and 33 males) from the 9th and 10th grade of the international educational complex № 132-134 in Baku city in the age range from 14 to 16 years old (  $M=14,6$ ;  $SD=0,6$  ). For the second step, 70 undergraduate students from Baku branch of the Moscow State University named after M.V. Lomonosov (48 female and 22 male) from 19 to 21 years old ( $M=19,8$ ;  $SD=0,8$ ).

## 2.2 Procedures

For the first group consisting of schoolchildren, the research took place at the school venue. Then the informed consent was signed by adolescents and their parents. After gaining informed consent, the researcher gave each participant a survey packet and explained that they may stop participation at any time. Then the researcher asked the participants to read the guidelines carefully and fill in sections of the survey. After the surveys were completed the researcher debriefed the participants and gave them further information about the nature of the study. The participants were asked if they had any questions and thanked for their cooperation in the end. The procedure was identical for the students from the University but the informed consent was provided for participants only.

## 2.3 Measures

**Implicit Theories Inventory.** Implicit theories, goal orientations, and academic self-concept were assessed using the Russian version of Smirnov's translation of Dweck's brief questionnaires (Dweck, 2006; Kornilova et al. 2009). This instrument measures students' beliefs about their general performance in studying and a subjective value of effort invested into it. Testing and approbation of the questionnaire on the Azerbaijani sample was made in 2015. We performed a cross-cultural comparison of Russian and Azerbaijani students with respect to implicit theories and goal orientations after what results were presented in the International Academic Conference on Education and Psychology (IACEP 2015) in Istanbul, Turkey (Kornilova, Chumakova, Ismailova, 2015).

**TIPI – Ten Item Personality Inventory.** The brief Big Five questionnaire named TIPI that measures Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness were assessed by using the Russian version (Kornilova, Chumakova 2016). Statements were selected from descriptions which were already existing in the questionnaires of The Big Five. Also there were performed a cross-cultural comparison of Russian and Azerbaijani students with respect to five factors with validation of an extremely brief measure TIPI in Russian and Azerbaijani students (Kornilova, Zirenko, Guseynova, 2017). In current study has been expected to identify the relationship between the psychological characteristics of Azerbaijani students and pupils, measured in The big five model's framework and their academic performance (in the conditions of the Azerbaijani education system). The Ten-Item Personality Inventory (TIPI) consists of two descriptors, separated by a comma, using



the common stem, “I see myself as:”. Each of the five items was rated on a 7-point scale ranging from 1 (disagree strongly) to 7 (agree strongly) (Gosling, 2003).

**Academic achievement.** The baseline measure of academic achievement was students' GPA (grade point average) for the three semesters through official transcripts GPA (Kuncel et al., 2005).

### 3. Results

#### 3.1 Comparison of groups of students and pupils according to the measured variables.

Table 1: Descriptive statistics for personality variables split by groups of pupils and students

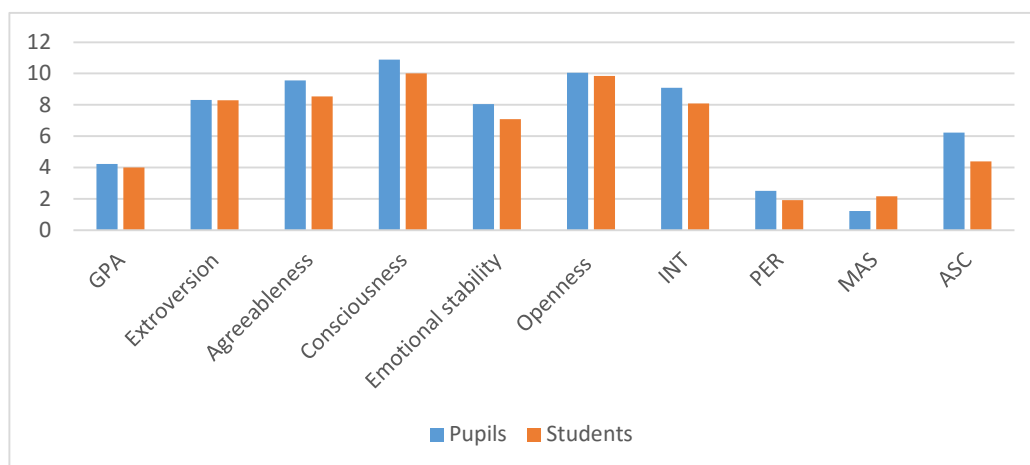
	Pupils	Students		
	M	M	Sig.Diff.	P
GPA	4,22	3,99	0,03	<b>0,08</b>
Extroversion	8,31	8,29	0,97	0,89
Agreeableness	9,55	8,52	0,01	0,68
Consciousness	10,88	10	0,02	0,54
Emotional stability	8,05	7,08	0,04	0,1
Openness to experience	10,05	9,83	0,56	0,3
Incremental intelligence (INT)	9,09	8,08	0,4	0,4
Enriched personality (PER)	2,50	1,91	0,64	0,26
Mastery goals measure (MAS)	1,22	2,16	0,94	0,23
Academic self-concept scale (ASC)	6,23	4,38	0,26	<b>0,05</b>

Means (*M*), standard deviations (*SD*), ranges, internal consistencies ( $\alpha$ ) and correlations for all variables are presented in Table 2. Both the general and self-theory of Intelligence measures demonstrated significant correlations with the achievement and motivational variables, with the exception of performance approach goals, which were significantly correlated only with the self-theory scale.

According to the results presented in Tab. 1, pupils' sample demonstrated higher GPA and ASC than students' with a certain trend toward significance ( $p$  (GPA)=0.08;  $p$  (ASC) = 0,05).

Figure 1. Means for personality variables and GPA by groups of pupils and students





Note: the Bold font in the table indicates significant differences ( $0,01 \leq p \leq 0,05$ )

### 3.2 Comparison of groups of students and pupils according to the measured variables by gender.

Table 2. Descriptive statistics for personality variables split by gender of pupils' and students' groups

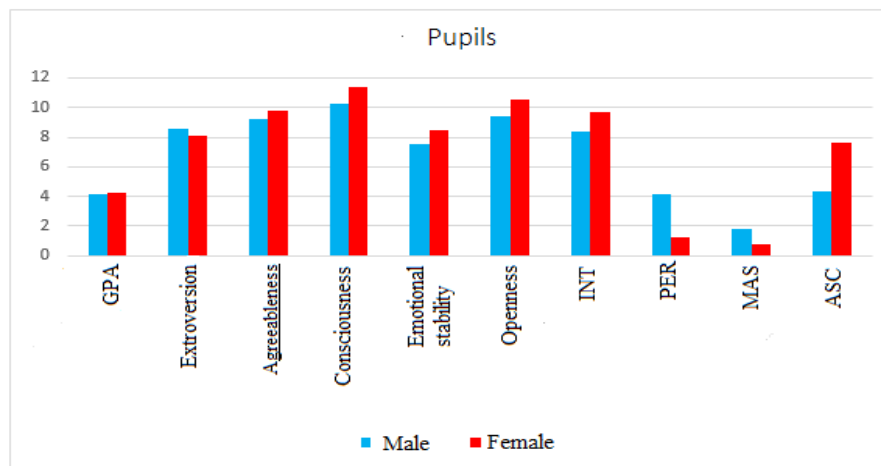
		Male	Female		
		M	M	Sig.Diff.	P
GPA	Pupils	4,16	4,27	-,76	0,44
	Students	3,64	4,13	-2,77	<b>0,001</b>
Extroversion	Pupils	8,57	8,11	0,7	0,48
	Students	8,75	8,10	0,88	0,37
Agreeableness	Pupils	9,24	9,79	-0,95	0,34
	Students	8,8	8,41	,059	0,55
Consciousness	Pupils	10,27	11,34	-2,08	<b>0,04</b>
	Students	9,4	10,25	-1,29	0,2
Emotional stability	Pupils	7,54	8,43	-1,23	0,22
	Students	7,5	6,91	0,83	0,4
Openness to experience	Pupils	9,45	10,5	-1,98	<b>0,05</b>
	Students	9,55	9,95	-0,72	0,46
Incremental intelligence (INT)	Pupils	8,33	9,65	-0,86	0,39
	Students	5,55	9,14	-1,79	0,07
Enriched personality (PER)	Pupils	4,18	1,25	1,54	0,12
	Students	0,85	2,35	-0,79	0,42
Mastery goals measure (MAS)	Pupils	1,78	0,79	0,9	0,36
	Students	0,05	3,04	-2,46	<b>0,01</b>
Academic self-concept scale (ASC)	Pupils	4,33	7,65	-2,76	<b>0,001</b>
	Students	0,6	5,95	-3,47	<b>0,001</b>



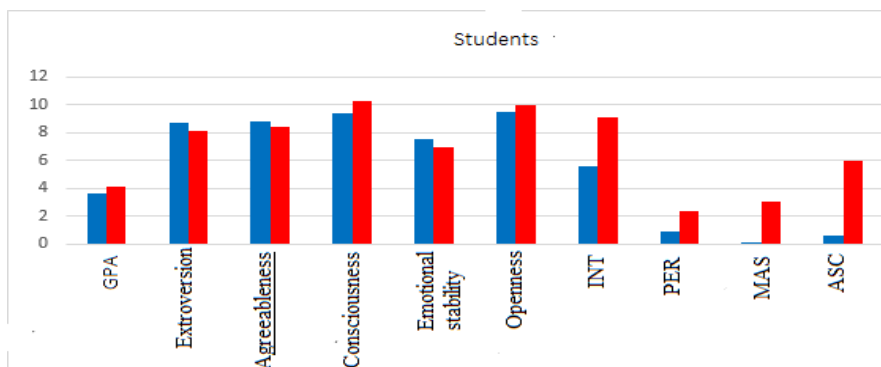
*Note: the Bold font in the table indicates significant differences ( $0,01 \leq p \leq 0,05$ )*

According to the results presented in Table 2, female students' academic performance and acceptance of learning goals are higher than male students'; female pupils' openness to experience and consciousness is higher than male pupils'; female students' and female pupils' academic self-concept is higher than male pupils' and male students', what can clearly be observed on Figures 2 and 3.

*Figure № 2 . Means for personality variables split by gender on pupils' group*



*Figure № 3. Means for personality variables split by gender on students' group*



Conforming to the above Tab. 1 and Tab. 2 and Fig. 1, Fig. 2 and Fig. 3, female has higher academic achievement, adoption of mastery goals and academic self-concept, which describes these indicators as attached to the gender, not to the stage of development, i.e. they do not develop while people move from school to University, on the contrary, the indicators are higher in pupils, that means they decrease with the transition to University life.

### 3.3 Intercorrelation of variables by student and school sample

*Table 3. Correlations between GPA and personality variables*





		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10
(1)-GPA	r		0,119	-0,160	0,214	0,076	0,074	-0,087	-0,202	0,420**	0,505**
	p		0,334	0,193	0,080	0,537	0,548	0,480	0,098	0,000	0,000
(2)-Extroversion	r	0,095		0,042	-0,199	0,329**	0,185	0,210	0,137	0,017	-0,056
	p	0,479		0,731	0,104	0,006	0,131	0,086	0,266	0,888	0,653
(3)-Agreeableness	r	-0,236	-0,072		-,054	-0,023	0,006	-0,022	0,159	-0,173	0,005
	p	0,075	0,531		0,663	0,851	0,959	0,858	0,196	0,158	0,966
(4)-Consciousness	r	0,094	-0,152	0,370**		0,211	-0,025	0,071	-0,132	0,137	0,379**
	p	0,481	0,187	0,001		0,084	0,837	0,563	0,283	0,266	0,001
(5)-Emotional stability	r	0,064	-0,262*	0,165	0,104		0,013	-0,037	0,009	0,063	-0,054
	p	0,636	0,021	0,151	0,368		0,919	0,767	-0,940	0,608	0,664
(6) Openness	r	-0,088	-0,022	0,050	0,168	-0,024		0,081	0,035	0,165	0,252*
	p	0,514	0,853	0,667	0,145	0,834		0,512	0,775	0,178	0,038
(7) INT	r	0,109	0,017	0,095	0,255*	0,033	0,255*		0,476**	0,094	-0,003
	p	0,415	0,887	0,413	0,025	0,774	0,025		0,000	0,445	0,981
(8) PER	r	-0,066	0,059	0,183	0,044	-0,214	0,035	0,213		-0,148	-0,115
	p	0,623	0,612	0,112	0,706	0,061	0,762	0,063		0,228	0,349
(9) MAS	r	-0,066	-0,170	-0,013	-0,013	0,101	0,110	-0,070	-0,040		0,481**
	p	0,623	0,139	0,910	0,910	0,382	0,341	0,543	0,732		0,000
(10) ASC	r	0,115	0,115	0,172	0,327**	0,121	0,307**	0,347**	-0,040		
	p	0,392	0,392	0,134	0,004	0,294	0,007	0,002	0,732		

Note: \* is used for  $p < .05$ , \*\* is used for  $p < .01$ . Correlations for the students are presented above the diagonal and correlations for pupils' sample are presented below the diagonal..

As claimed by the Table 3, only students with indicators of goal orientations ( $r=0.420^{**}$ ;  $p \leq 0.001$ ) and academic self-concept ( $r=0.505^{**}$ ;  $p \leq 0.001$ ) have a connection with GPA. Successful students adequately appreciate their academic achievements and believe that intelligence can be developed (this is "incremental theory"). Mastery goals aim at increasing competence, whereas performance goals are related to confirming competence and avoiding negative judgments.

*Emotional stability* of students ( $r=-0.329^{*}$ ;  $p \leq 0.05$ ) and pupils ( $r=-0.262^{*}$ ;  $p \leq 0.05$ ) is negatively related to *extraversion*. It is obvious that people whose behavior is aimed at active interaction with others are less emotionally stable.

Both pupils' and students' *consciousness* (pupils:  $r=0.327^{*}$ ; students  $r=0.379^{**}$   $p \leq 0.05$ ) and *openness* (pupils:  $r=0.307^{*}$ ;  $p \leq 0.05$ ; students  $r=0.252^{*}$   $p \leq 0.05$ ) positively associated with *academic self-concept*. This means people who perceive the novelty and changes are in the same time responsible, diligent, purposeful and better at assessing their academic abilities.



Pupils with higher *conscientiousness* ( $r=0,255^*$ ) and *openness* ( $r=0,239^*$ ) are more strongly believe that intelligence can develop. Pupils who are flexible and open for changes are persistent and purposeful also they consider intelligence can improve during the studying process.

Pupils' implicit theory of *enriched personality* is negatively related to *academic self-concept* ( $r=-0,230^*$ ). Pupils who believe that a person can develop after effort or special circumstances - assess their learning wrong in comparison with pupils who believe the person does not develop.

Students' implicit theory of *enriched personality* ( $r= 0.476^{**}$ ) is associated with *incremented intelligence*. Students who assume a person can develop think that intelligence can also improve.

### 3.4 Identifying predictors of academic achievement

Linear regression analysis was used for data analysis where academic achievement was a dependent variable. Here was created two models – one for pupils and another for students. Each model included indicators of *The Big Five* and *Implicit Theories* as predictors. It was not possible to identify predictors of performance in regression analysis of pupils' model after what model for students with addition of all the variables separately was created. Significant predictors of students' achievement were *academic self-concept*, the adoption of the implicit theory of *enriched personality* and *mastery goal*.

Table 4 . Personality variables as predictors of academic performance

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate
1	0,744(a)	0,553	0,517	0,4447

Note: Predictors: (Constant), Emotional stability, acceptance of it "enriched intelligence", academic self concept.

Table 5. Regression analysis coefficients

Mode		$\beta$	Std.Error	T	p
		4,060	,282	14,379	0,0001
	Incremental intelligence	-,025	,009	-2,848	0,006
	Academic self concept	,065	,009	7,053	0,0001
	Agreeableness	-,059	,024	-2,464	0,017
	Emotional stability	,046	,023	2,036	0,047

Note: dependent variable is GPA



Following the Tab. 4 and Tab. 5 this model ( $F(df) = 15,174(4)$ ,  $p = 0.000$ ,  $\Delta$  Adjusted  $R^2 = 0,517$ ) demonstrates a significant contribution of variables to the adoption of implicit theories "*incremented*" intelligence ( $B = -0,025$ ;  $p=0.006$ ), *academic self concept* ( $B = 0,065$   $p=0.0001$ ), *disagreement* ( $B = -0,059$   $p=0.017$ ), emotional stability ( $B = 0,046$   $p=0,047$ ) for the academic achievement in the student sample.

According to Tab. 4 and Tab. 5 we look at the  $R^2$ . This shows how much this model explains the dispersion of data's performance. The significance level is  $< 0.05$  and this shows that this model works at 55% ( $R^2$ ).

The following equation for the student sample was constructed for this model:

$$\text{Academic achievement} = 4,060 + (-0,25) \cdot \text{incremental intelligence} + 0,065 \cdot \text{Academic self concept} + 0,059 \cdot \text{Disagreement} + 0,046 \cdot \text{Emotional Stability}$$

#### 4. Conclusion

*Hypothesis* that intellectual and personal potential is a predictor of academic achievements is partially reflected in results but only on the *student sample*.

There strong positive correlation between *learning performance* and the *mastery goals* ( $r=0.420^{**}$ ;  $p \leq 0.001$ ) as well as with *academic self-concept* ( $r= 0.505^{**}$ ;  $p \leq 0.001$ ), which partially confirms the hypothesis due to the fact that the correlation analysis with the indicators of the *big five traits* were not found. The results submit that students who appreciate their success in the learning process and believe that intelligence can develop usually achieve great success in studies.

After regression analysis, we can see that in addition to scales of *Dweck-Smirnov's questionnaire* the *big five's* still make a significant contribution to *academic performance*. Indicators such as *disagreement (or criticality)* and *emotional stability*. It revenues that non-impulsive, non-sensitive students who are ready for discussions and critical assessments are more successful in learning. The fact that these personal indicators were not predictors of performance in pupils' sample, clarifies that they are formed by age and during the development process in the new social situation – education in high school.

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