Developing Academic Persistence in the International Baccalaureate: Educational Strategies, Associated Personality Traits and Outcomes

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Abstract

The aim of the study was to investigate the relationships between certain educational strategies and students' personality traits, on the one hand, and students' academic performance, on the other, respectively between the latter and two types of outcomes (i.e. students' academic performance and intentions to drop out of high school). These relationships were examined in two educational settings: in the Diploma Programme (DP), a two-year college-preparatory curriculum offered by the International Baccalaureate (IB), an international private educational system, and the traditional Romanian schools. A sample of IB students in 3 Eastern and Central European countries, and a comparison sample of non-IB students in Romania participated in the research. Results reveal several educational strategies and personality traits among those suggested by previous investigations that significantly sustain IB DP students' academic persistence. Also, IB students' academic performance and dropout intentions are influenced by these traits and educational strategies, and these effects are fully or partially mediated by academic persistence. A different pattern of associations emerged in the non-IB sample, with independent work style as the most important determinant of academic persistence, suggesting that relative to the traditional Romanian schools, the IB programme promotes a climate that better supports students in completing their education.

Keywords: academic persistence, academic performance, drop-out, personality, educational strategies, International Baccalaureate

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Desarrollo de la Persistencia Académica en Programa Diploma y Bachillerato Internacional: Estrategias Educativas, Rasgos de Personalidad y Resultados

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Resumen

El objetivo principal de este estudio fue investigar, por una parte, la relación entre ciertas estrategias educativas y los rasgos de personalidad de los estudiantes y, por otra, la práctica educativa de los estudiantes, entre la última y dos tipos de resultados (la práctica educativa de los estudiantes y la intención de abandonar el curso). Ambas relaciones fueron analizadas en diferentes entornos: en el Programa Diploma (DP), un currículo de dos años de preparatorio para la universidad ofrecido por el Bachillerato Internacional (IB), un sistema educacional internacional privado, y las escuelas tradicionales rumanas. Una muestra consta de estudiantes IB procedentes de tres países de Europa del Este y Central y, la otra muestra, para comparar, de estudiantes de Rumanía no pertenecientes al IB. Los resultados muestran que algunas estrategias educativas y los rasgos de personalidad sugeridos por investigaciones previas sostienen significativamente la persistencia académica de los estudiantes del IB DP. Asimismo, el rendimiento académico y las intenciones de abandono de los estudiantes del IB están influenciados por estos rasgos y estrategias educativas, efectos total o parcialmente mediados por la persistencia académica. En cuanto a la muestra de no estudiantes de la IB, emerge un patrón diferente de asociaciones, siendo un estilo de trabajo independiente el factor más determinante en la persistencia académica. Esto sugiere que, en comparación con las escuelas rumanas tradicionales, el programa IB promueve un ambiente que sostiene, de manera más exitosa, la finalización de la educación de los estudiantes.

Palabras clave: persistencia académica, rendimiento académico, abandono, personalidad, estrategias educativas, International Baccalaureate

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A cademic persistence represents a paramount concern for instructional systems attempting to provide high graduation rates, together with instilling the skills needed by students to succeed. Completing secondary education is not only mandatory for ensuring access to higher levels of instruction and is responsible for several adjustment indicators. For instance, its reverse phenomenon, dropout, is a predictor of future placement problems and unemployment (Rumberger & Lamb, 2003). Identifying the variables that explain and predict persistence and achievement is thus a high stake for educational institutions and policy makers.

The main premise of our investigation is that participation in a specific educational program - the International Baccalaureate (IB) - may contribute to the traits, skills and attitudes that allow students to persist in short- and long-term goals. Persistence is related to multiple achievement outcomes (Hardre & Reeves, 2003; Reason, 2003, 2009). Many authors maintain that motivation affects the intention to persist in educational programs (Astin, 1984; Rumberger, 2006) and some models stress the need for an integrative approach of the phenomenon. In this respect, educational psychologists tried to conceptually articulate integrative and comprehensive models. For instance, Tinto's (1993) model of student attrition describes several factors contributing to student departure, including the pre-enrolment attributes of students (socio-demographic traits), family background, and prior schooling experiences, in terms of both social adjustment and academic performance. Understanding who leaves school and why is necessary for creating preventive school support mechanisms, since dropout is considered an insidious, continuous process of disengagement (Finn, 1989; Rumberger, 2000), thus finding the levers of this process for deactivating them early is crucial. Research has shown that dropout is associated to various factors, such as low identification with school and feeling of belongingness (Finn, 1989), aggressiveness (Crain-Dorough, 2003), substance abuse (Freudenberg &Ruglis, 2007), or truancy and discipline problems (Rumberger, 2000). Factors related to school and teaching practices have also been diagnosed: low level of teacher commitment or attendance (Crain-Dorough, 2003), teaching staff turnover (Voicu, 2010), minimal support in transitional stages from one level to another (Blue & Cook, 2004), teasing and bullying victimization

(Cornell, Gregory, Huang & Fan, 2013). Other structural characteristics of the institutions, such as the magnitude of schools and classes, reflected in student-teacher ratios (Andrei, Profiroiu, Profiroiu, & Iacob, 2011), deficient evaluation systems (Govindaraju & Venkatesan, 2010), or bureaucratized and rigid structures and policies (Angus & Mirel, 1999), seem to be other factors determining low attrition rates.

Positive effects on persistence have been shown by higher budgetary allocation to student services, low student-teacher ratio (Chen, 2012), perceived institutional support for all demands of the students, including social and emotional needs (LanRong & Preissle, 2009), support and encouragement offered by teachers (Hu & Ma, 2010), practicing active teaching pedagogies (Braxton, Bray& Berger, 2000), promoting positive attitudes, such as civic engagement, curiosity, initiative, deep action learning (Allen, 2011), and fostering a culture of collaboration, open dialogue, teamwork and constructive debate (AlKandari, 2012).

Pre-enrolment attributes have gained preferential attention, with focus on personality factors that act as advantages, namely the malleable ones, which can add to fostering the right type of academic motivation. Among these, scholars have highlighted the following: self-efficacy beliefs (Zimmerman, Bandura& Martinez-Pons, 1992), ability beliefs or growth mindsets (Blackwell, Trzesniewski, &Dweck, 2007), academic engagement (Fredricks, Blumenfeld, & Paris, 2004), autonomous academic motivation (Deci& Ryan, 1987), student engagement (Martin, 2007), academic resilience (Alva, 1991), willful self-control, tenacity and grit (Duckworth, Peterson, Matthews, & Kelly, 2007).

The International Baccalaureate Educational System
The International Baccalaureate Organization (IBO) is an international educational foundation. In 2014, it reported almost 5,500 programs offered in more than 4,000 schools around the world. The IBO offers four educational programmes, one of which is the Diploma Programme (DP) for students aged 16 to 19 years. The IB DP represents a two-year pre-university curriculum leading to a qualification welcomed by leading universities around the world. (IBO, 2013). In Romania, the program has been implemented since 1997;

currently there are three schools in Bucharest that offer IB programmes, including the DP.

Comparatively, the state-managed traditional Romanian school system includes 12 grades, out of which the first 10 are mandatory. The high school system, regulated by a distinct set of laws, includes grades 9 to 12, with no demarcation between them, in contrast to the 2-years IB DP enrolling students in their final two years of high school. Students graduating from the 12th grade are required to pass the national baccalaureate examination, which represents an important criterion in the admission to higher education institutions. Around 700.000 students are currently enrolled in the high school state system.

Particular to the IB Program are the college-preparatory curricula and the high academic standards (VanTassel-Baska, 2003), reflected in the teachers' continuous professional development and peer collaboration. Also central to IB philosophy is the active promotion of the stated values, namely the educational objectives contained by the IB Learner Profile, which are embedded in practices and visible in everyday academic experiences (International Baccalaureate Organisation, 2012), among which the most prominent are the emphasis on intercultural understanding, critical thinking and active citizenship. Besides the active promotion of these mission elements, the reputation of the IB Program consists in designing a system based on the particularities of young learners that is managing - despite multiple challenges and elevated stress - to shape dedicated, balanced, and academically prepared students (Shaunessy et al., 2006). In this respect, some studies indicate that following the IB DP contributes to the formation of cognitive and non-cognitive skills required for academic success (Brunold-Conesa 2010; Wright & Lee, 2014). Also, the beneficiaries of the educational program are allowed to make academic choices and set learning goals according to their interests, within a consistent instructional framework that pays close attention to cross-discipline integration.

Holman et al. (2015) reported a qualitative investigation of the relevant IB documents and the IB DP teachers' perspective onthe educational strategies through which the IB programme fosters students' academic persistence and on the personality traits that might contribute to IB students' academic

persistence. Their results indicated ten strategies through which the IB DP intends to foster academic persistence in its students, namely a) applicability of knowledge, b) clear framework, c) independent work style, d) teachers' involvement, e) focusing on the student, f) intense collaboration and partnership with the teachers, g) small class size, h) updated curricula, i) comprehensive curricula, j) curricula focused on students' real, practical needs. Moreover, six personality traits were also assumed in the IB official documents and by the IB DP teachers to be strongly related to academic persistence and, consequently, targeted by the IB educational strategies, namely proactive attitude, self-efficacy, mastery goals, academic resilience, restraint and critical thinking.

The present study aimed to explore the actual relationships between these two sets of factors (i.e. educational strategies and students' personality traits) and students' academic performance, respectively two types of outcomes (students' academic performance and intentions to drop out of high school). The first aim of the study was to identify, among the educational and personality factors perceived as relevant by the IB representatives, those that actually support academic persistence, in an IB DP student sample from three European countries. The second aim was to investigate the relations between students' traits, IB strategies, academic persistence and its presumed outcomes. In this respect, we hypothesized that academic persistence has a mediating role in the relationships between certain educational strategies (as perceived by students) and personality traits, on the one hand, and certain outcomes, namely academic persistence and dropout intentions. The third aim of our research was to explore the differences between IB students and equivalent non-IB students from regular Romanian schools in what regards the relationships between the variables under scrutiny (academic persistence, its associated traits and educational mechanisms, and its relevant educational outcomes),thus examining whether the IB educational environment generates a distinctive set of influences in this area in comparison to the traditional Romanian school system.

Method

Participants

The study was approved by the Research Ethics Committee of the faculty where the authors are affiliated, permissions for the study were obtained from the schools' authorities, and all participants gave written informed consent. The questionnaire was distributed to 554 high school students; 30 did not fill in the items concerning the outcomes of academic persistence, hence they were eliminated from the final sample. The final IB sample includes 226 students enrolled in the IB DP (141 or 62.4% females) in schools located in three Eastern European countries (104 from Romania, 100 from Poland, and 22 from the Czech Republic). The final non-IB sample includes 328 students (234 or 71.3% females) in the 11th and 12th grade in top-ranking Romanian high schools. Participation in the research was voluntary; all students we approached accepted to participate. All students were informed about the purpose of the study and they were assured that no personal data would be disclosed. Students completed the questionnaires in their classroom, under the supervision of a teacher.

The two samples (IB and non-IB) are comparable given the fact that parental educational level is similar in the two samples; neither the difference between the students in the IB sample and those in the non-IB sample on the mother's educational level (p=.42) nor the difference on the father's educational level (p=.57) are significant as indicated by the Mann-Whitney test.

Measures

Educational strategies presumed to foster academic persistence. We built short (3-item) scales evaluating students' perceptions concerning each of the 10 aforementioned strategies, which required participants to estimate the degree to which each strategy is reflected in their daily academic experience. The items of these instruments were derived from the qualitative data reported in Holman et al. (2015). The response scale for each instrument ranged from 1 = "strongly disagree" to 6 = "strongly agree". For each scale, we computed

both the mean inter-item correlation (MIIC) and Cronbach's alpha as reliability indices. All scales showed satisfactory levels of reliability.

a.1. Applicability of knowledge (Cronbach's alpha = 0.78; MIIC=.50) refers to the degree to which the theoretical knowledge transmitted in school is applied to practical issues; sample item: "We are often required to apply the theoretical knowledge to various practical situations".

a.2. Clear framework (Alpha Cronbach=0.57, MIIC=.30) refers to the perceived transparency and clarity of obligations and responsibilities, tasks and assignments of the evaluation system; sample item: "We always know why we received a certain mark".

a.3. Independent work style (Alpha Cronbach=0.59, MIIC=.23) regards the presence of opportunities and encouragements offered by the school to develop and maintain independent work habits in their students; sample item: "We are often assessed based on the projects we carry out independently".

a.4. Teachers' involvement (Alpha Cronbach=0.72; MIIC=.47) addresses the perceptions on about the degree of teacher engagement in the instructional process; sample item: "I believe that teachers are not involved enough in our education."

a.5. Focusing on the student (Alpha Cronbach=0.51; MIIC=.50) refers to the degree to which teachers take into consideration students' needs and preferences; sample item: "I would like to receive more guidance from my teachers"– reverse coded.

a.6. Intense collaboration and partnership with the teachers (Alpha Cronbach=0.79; MIIC=.50) describes the general evaluation of the quality of the teachers-students relationship; sample item: "Teachers are a real support for me".

a.7. Student class size (Alpha Cronbach=0.44; MIIC=.20) measures the views regarding the adequacy of class sizes for the achievement of educational goals, or whether they should be adjusted in order to serve every student's needs appropriately; sample item: "During the courses, teachers always have enough time to offer me further explanations or support when I need it".

a.8. Updated curricula (Alpha Cronbach=0.52; MIIC=.27) refers to the novelty and appropriateness of the educational contents and technologies to students needs and demands; sample item: "The topics we studystudy often seem obsolete to me" – reverse coded.

a.9. Comprehensive curricula (Alpha Cronbach=0.51; MIIC=.27) refers to the broadness of the subjects and the degree to which they satisfy all the knowledge demands of students; sample item: "The disciplines I study at school cover my knowledge needs".

a.10. Curricula focused on the real, practical needs of students (Alpha Cronbach=0.63; MIIC=.37) refers to the perceived applicability and utility of the knowledge that the students usually attach to their academic work; sample item: "The topics I study at school will be useful for me in the future".

Personality traits presumed to foster academic persistence. We selected from the traits revealed by the qualitative results a set of six traits that, based on the literature, are assumed to be strongly related to academic persistence. Then, we identified in the scientific literature the optimal previously validated instruments that evaluate these traits, as follows.

b1. Proactive attitude scale (Schmitz &Schwarzer, 1999), an 8-item scale evaluating a factor with large implications for goal-directed behavior, namely the dimension of ambition (academic goal setting and pursuit). The reliability coefficients of the scale in the present sample were: Cronbach's alpha = 0.69; MIIC=.22.

b2. General Self-Efficacy Scale (Schwarzer& Jerusalem, 1995), tapping the dimension of self-confidence, evaluates broad positive beliefs in one's ability to manage difficulties and cope with challenges and stressful situations (Cronbach's alpha = 0.81; MIIC=.30).

b3. Mastery Goals Scale from the Motivated Strategies for Learning Questionnaire(MSLQ) (Pintrich et al., 1993, validated also by Daniels et al., 2009), tapping the dimension of self-development academic purposes, orstudents' tendency to choose goals and tasks in a way that allows them to focus on growth and development of their skills (Cronbach's alpha = 0.60; MIIC=.34).

b4. Academic resilience scale (Martin & Marsh, 2006) is a 6-item scale measuring students' ability to cope with stressors and school pressure, enabling them to persist in achieving their academic goals (Cronbach's alpha = 0.81; MIIC=.42).

b5. Critical Thinking scale from the Motivated Strategies for Learning Questionnaire (Pintrich et al., 1993) represents a subset of 5 items from the above-mentioned MSLQ that taps the higher order set of skills and strategies employed in applying information and knowledge to new problems or when critically evaluating new concepts and ideas (Cronbach's alpha = 0.76; MIIC=.39).

b6. Restraint subscale from the Brief Self-Control Scale (Tangney et al., 2004, validated also by Maloney et al., 2012), is a 4-item scale evaluating the dimension of self-discipline or individual ability to resist temptations and not succumb to momentary desires and impulses, in other words, to delay gratification (Cronbach's alpha = 0.50; MIIC=.20).

Academic persistence was addressed through a 4-item scale we adapted from the subscales *Degree Commitment, Institutional Commitment* and *Academic Consciousness* in the *College Persistence Questionnaire* (Davidson et al., 2009). Institutional commitment measures the loyalty and trust the student invests in the academic institution he or she is enrolled in, deriving from the satisfaction with the choice to pursue that specific educational program, while degree commitment refers to the importance or the strength of intentions to earn a degree. Academic Consciousness refers to the efforts the student invests in academic work in respecting deadlines, participating in school activities and completing required assignments (Cronbach's alpha = 0.82; MIIC=.50).

Outcomes of academic persistence. d1. Academic performance was measured through students' overall average grade on the previous semester, which they were required to write in the questionnaire.

d2. Intention to dropout scale (Hardre& Reeve, 2003) is composed of three items focused on the present academic aspirations including future schooling intentions, early indicators of persistence and dropout (Cronbach's alpha = 0.79; MIIC=.50).

e. The set of items covering participants' *socio-demographic characteristics:* gender, age, length of experience in the IB programs, grade, country of residence, parents' level of education (high school/university/master studies/PhD), ethnicity, nationality, and native language.

Results

Educational Strategies Significantly Associated to Academic Persistence in the IB Sample

In the IB sample, 9 out of the 10 educational mechanisms are significantly and positively correlated to academic persistence, and the tenth was marginally significant. The actual correlations of each mechanism were: applicability of knowledge: $r=.34$, $p<.01$, clear framework: $r=.29$, $p<.01$, independent work style: $r=.29$, $p<.01$, teachers' involvement: $r=.23$, $p<.01$, focusing on the student: $r=.19$, $p<.01$, intense collaboration and partnership with the teachers: $r=.29$, $p<.01$, students class size: $r=.34$, $p=.06$, updated curricula: $r=.30$, $p<.01$, comprehensive curricula: $r=.39$, $p<.01$, curricula focused on the real, practical needs of students: $r=.46$, $p<.01$.

Second, we introduced students' scores concerning their perceptions of the educational mechanisms as predictors in a multiple stepwise regression analysis (with academic persistence as criterion) in order to determine those with the strongest relationship to this variable. The regression model was significant ($F(2,223) = 32.21$, $p < .001$), with two significant predictors: curricula focused on the real, practical needs of students ($\beta = .35$, p<.001), and comprehensive curricula ($\beta = .16$, p<.05).

Personality Traits Significantly Associated to Academic Persistence in the IB Sample

All six traits are significantly and positively correlated to academic persistence: general self-efficacy: $r=.39$, $p<.01$; proactive attitude: $r=.34$, $p<.01$; academic resilience: $r=.33$, $p<.01$; critical thinking: $r=.30$, $p<.01$; mastery goals: $r=.40$, $p<.01$; restraint: $r=.34$, $p<.01$.

Second, we introduced the 7 traits as predictors in a multiple stepwise regression analysis (with academic persistence as criterion) in order to determine those with the strongest influence on this variable. The regression model was significant ($F(3,222) = 27.24$, $p < .001$) and included three significant predictors: mastery goals ($\beta = .28$, p<.001), restraint ($\beta = .22$, p<.001) and general self-efficacy ($\beta = .22$, p<.01).

In order to assess the joint influence of the educational mechanisms and the psychological traits on academic persistence, we tested the model including all the five predictors that emerged as significant from the previous two analyses. We performed a hierarchical multiple regression analysis, also controlling for age, class, parents' educational level, country, years of IB education and gender. In the regression model that already included the control variables, we introduced at each step each of the five predictors (two perceived educational mechanisms and three personality traits) in a fixed order, to check whether they significantly increase the predictive power of the model. The addition of four predictors (curricula focused on the real, practical needs of students; mastery goals; restraint; and general self-efficacy) significantly improves the prediction power of the regression model (in all four cases, the *F*-change statistic was significant, *p*< .05). In the case of the fifth predictor (comprehensive curricula), its inclusion did not significantly increase the percentage of variability of academic persistence explained by the model (*p*= .45 for its *F*-change).

To conclude, the joint statistical evaluation of both categories of factors – educational mechanisms and psychological traits – indicates that the strongest predictors of IB students' academic persistence are: curricula focused on the real, practical needs of students; mastery goals; restraint; and general self-efficacy. All the relationships between these predictors and academic persistence are positive, in the sense that the higher the score on these measures, the higher the level of academic persistence.

The Mediation Effect of Academic Persistence in the Relationships Between Educational Strategies and Psychological Traits, respectively Outcomes in the IB Sample

We performed separate sets of mediation analyses concerning each of the two outcomes. In each set we used as predictors the four factors that emerged in the previous analysis as the most important determinants of academic persistence. In accordance with Baron and Kenny (1986), mediation is first indicated by the significant relationships between the three variables (predictor, outcome and mediator). Then, two regression analyses should be performed, with the outcome as dependent variable: one that includes only the respective predictor, and one including both the predictor and the presumed

mediator. Mediation is indicated by the reduction of the effect of the predictor on the outcome when the mediator is included in the model.

Outcome 1: Academic performance (overall average grade on the previous semester). First, we examined the relationship between the presumed mediator - academic persistence - and student's overall average grade, through linear regression. Results show that academic persistence significantly predicted the overall average grade ($\beta = .23$, $p<.01$). Then, we verified the effect of each of the four factors of academic persistence on the overall average grade and the mediation effect of academic persistence in these relationships. Table 1 presents the standardized regression weights resulted in the two regression analyses performed for each predictor, including academic performance as criterion. It can be noticed that while all 4 predictors are significantly associated to this outcome in the first analysis, two of them (Curricula focused on the real, practical needs of students and Restraint) are no longer significant in the second analysis (which also includes academic persistence as predictor). According to Baron & Kenny (1986), this pattern of results (the lowering of predictive power, as indicated by β–below significance in the model with the addition of the mediator) indicates that the influence of these predictors on the criterion (overall average grade) is fully mediated by the mediator (academic persistence). In the other two cases, results indicate partial mediation, since the respective predictors remain significantly associated to the outcome even when the mediator (academic persistence) is added. Thus, these predictors (Mastery goals and General self-efficacy) also exert other types of influence on the overall average grade besides the effect mediated by academic persistence.

Table 1. *Results of the mediation analysis with Academic performance as outcome in the IB sample*

Predictor	Only the predictor included in regression analysis	Predictor and academic persistence included in regression analysis
Curricula focused on the real, practical needs of students	$\beta = .15^*$	Predictor: $\beta = .005$ (ns.) Academic persistence: $\beta = .21^{**}$
Mastery goals	$\beta = .25^{***}$	Predictor: $\beta = .19^{**}$ Academic persistence: $\beta = .17^*$
Restraint	$\beta = .20^{**}$	Predictor: $\beta = .13$ (ns.) Academic persistence: $\beta = .19^{**}$
General self-efficacy	$\beta = .26^{***}$	Predictor: $\beta = .20^{**}$ Academic persistence: $\beta = .17^*$

$^*p<.001; ^{**}p<.01; ^*p<.05$

Outcome 2: Dropout intentions. The relationship between the presumed mediator (academic persistence) and students' dropout intentions is significant and negative ($\beta = -.41$, $p<.001$), showing that students with high academic persistence are less likely to drop out of school. Table 2 presents the main results of the two regression analysis performed in order to test the mediating role of academic persistence in the influence of the four predictors on dropout intentions. Results show that all these predictors are significantly related to this outcome, and that in the case of two predictors (Mastery goals and Restraint) their influence is fully mediated by academic persistence, while in the other two cases the latter only partially mediates their effect on dropout intentions.

Table 2. *Results of the mediation analysis with Dropout intentions as outcome in the IB sample*

Predictor	Only the predictor included in regression analysis	Predictor and academic persistence included in regression analysis
Curricula focused on the real, practical needs of students	β = -.33***	Predictor: β = -.17* Academic persistence: β = -.33***
Mastery goals	β = -.16*	Predictor: β = -.001 (ns.) Academic persistence: β = -.41***
Restraint	β = -.25***	Predictor: β = -.13 (ns.) Academic persistence: β = -.37***
General self-efficacy	β = -.27***	Predictor: β = -.13* Academic persistence: β = -.36***

*p<.001; *p<.05

Educational Strategies Significantly Associated to Academic Persistence in the non-IB Sample

In the non-IB sample, 7 out of the 10 educational strategies are significantly associated with students' academic persistence, with lower correlations than those in the IB sample: applicability of knowledge: r=.18; p<.01, clear framework: r=.19; p<.01, independent work style: r=.29; p<.01, teachers' involvement: r=.22; p<.01, intense collaboration and partnership with the teachers: r=.20; p<.01, updated curricula: r=.12; p<.05, comprehensive curricula: r=.20; p<.01. Then, we identified the strongest predictors of academic persistence in this group of educational mechanisms through a multiple stepwise regression. The regression model was significant (F(1,326) = 30.18, p< .001) and included only one significant predictor: independent work style ($β$ = .29, p<.001).

Personality Traits Significantly Associated to Academic Persistence in the non-IB Sample

In the non-IB sample, four traits are significantly correlated to academic persistence: general self-efficacy: $r=.32$; $p<.01$; proactive attitude: $r=.36$; $p<.01$; academic resilience: $r=.23$; $p<.01$; mastery goals: $r=.20$; $p<.01$. In the multiple regression analysis performed in order to identify the strongest predictors of academic persistence in this category, a significant regression model emerged ($F(1,326) = 48.51$, $p < .001$) which included only one predictor: proactive attitude ($\beta = .36$, $p<.001$).

The Mediation Effect of Academic Persistence in the Relationships Between Educational Strategies and Psychological Traits, Respectively Outcomes in the non-IB Sample

Outcome 1: Academic performance. The relationship between the presumed mediator (academic persistence) and the overall average grade is significant and positive ($\beta = .16$, $p<.01$). Then, we verified the effect of each of the two factors of academic persistence found in the non-IB sample on the overall average grade and the mediation effect of academic persistence in these relationships.

a. *independent work style* significantly predicts the overall average grade ($\beta = .15$, $p<.01$). In the model including both this predictor and the presumed mediator, both factors emerged as significantly predicting the overall average grade: academic persistence ($\beta = .13$, $p<.05$) and independent work style ($\beta = .12$, $p<.05$), indicating that the effect of this educational mechanism on the overall average grade is partially mediated by academic persistence.

b. *proactive attitude* is not a significant predictor of the overall average grade($\beta = .05$, $p=.33$).

Outcome 2. Dropout intentions. The relationship between the presumed mediator (academic persistence) and student's dropout intentions is significant and negative, high academic persistence significantly predicting low levels of dropout intentions ($\beta = -.30$, $p<.001$).

a. *independent work style* is not a significant predictor of dropout intentions ($\beta = -.06$, $p=.28$).

b. *proactive attitude* is not a significant predictor of dropout intentions (β = .01, p=.07).

Discussion

The general objective of this study was to identify the IB instructional approaches and the individual traits that support academic persistence, and to examine their impact on two relevant academic outcomes, as well as the mediating role of academic persistence in this relationship. Wefound that the IB instructional strategies highlighted by the IB documents and IB DP teachers(Holman et al., 2015)have a significant fostering effect on academic persistence in the IB sample: students with high levels of academic persistence also tend to perceive their school as actively employing these educational mechanisms. Next, we found that among the ten strategies under scrutiny, the curricula focused on the real, practical needs of students has the greatest impact on academic persistence. Promoting civic engagement, curiosity, initiative and deep action learning has been previously shown to have an important impact on commitment in difficult tasks (Allen, 2011). Making the practical use of knowledge salient, establishing the associations between concepts, explanations and real life facts is strengthening commitment to learning. When students work to acquire knowledge and skills that they perceive as relevant, they are more persistent in their academic endeavors (Eccles et al., 1983). Also important are the links between the academic contents and the personal interests and values of the learner, this correspondence leading to enhanced academic performance (Hulleman & Harackiewicz, 2009). On the other hand, inadequate curricula and instructional practices, coupled with lack for support in transitional stages from a level to another (Blue & Cook, 2004), and poor school practices and policies (Rumberger, 2000) predispose students to dropout.

We also found that the students' individual traits that we tested in relationship with academic persistence (i.e. proactive attitude, self-efficacy, mastery goals, academic resilience, critical thinking, and restraint) are significantly associated with academic persistence in the IB sample. Further analysis revealed that three traits that have the strongest effect on academic

persistence: mastery goals, restraint and general self-efficacy. Mastery goals refer to students' tendency to choose goals and tasks in a way that allows them to focus on growth and development of their skills, not only achieving formal acknowledgment and rewards for their work (Pintrich et al., 1993; Daniels et al., 2009). Our results show that students oriented towards self-development, who approach learning situations as opportunities and, thus, perceive their educational efforts as investments towards mastery goals, have higher levels of academic persistence, in line with the dominant conceptualizations of this type of motivation (Harter, 1978). Restraint reflects the students' capacity to engage in long term tasks by avoiding being sidetracked by momentary distractions and temptations, with minimum adult supervision (Tangney, Baumeister, & Boone, 2004). As the learning process frequently requires the capacity to delay immediate gratification, exercising effortful self-control in avoiding temptation predicts higher test scores (Mischel, 2014). Previous results also show that conscientiousness, a related trait, is a predictor of effort across disciplines and achievement, such as GPA (Noftle & Robins, 2007). General self-efficacy covers the beliefs and confidence in the ability to face difficult and challenging tasks (Schwarzer& Jerusalem, 1995). Its positive connection with self-confidence and self-efficacy beliefs has been frequently reported in the educational literature (Brown et al., 2008). Such beliefs predict the effort invested in academic activities and, consequently, students' persistence (Trautwein, et al., 2009).

The importance of academic persistence among the educational effects of the IB programme has also been highlighted by previous studies, although only at an implicit level. For instance, Wright (2014), in a synthetic overview of the long term outcomes of the IB programmes, shows that their mission and instruction focus on enhancing people with an integrated personal system of social values and dispositional orientations that ensure long-lasting effects in their life by becoming lifelong learners. Our study reveals some of the actual mechanisms of those effects, as well as the role of academic persistence and the educational strategies that can enhance it.

Concerning the relationships between the components of the IB DP, the individual traits, academic persistence and its outcomes, results show that IB DP students' academic performance and intention to dropout are related to the traits and educational strategies under consideration, and that these effects are

fully or partially mediated by academic persistence. Students with intense mastery goals, who also believe in their abilities to successfully overcome academic obstacles and attain their objectives, and who are able to engage in effortful restrained behaviors and delay gratification are those with high academic persistence. Furthermore, their commitment leads to higher academic performance and lower intentions to drop out. A similar influence on the two outcomes is that exerted by the perception of the curricula as focused on the real practical needs of the student, an effect that is also mediated by academic persistence. Previous investigations revealed the importance of some of these dimensions in the educational setting; for instance, general self-efficacy was shown to have a potentially preventive role in academic dropout (Shannon & Bylsma, 2005), while other studies have concluded that personal beliefs about one`s capabilities of succeeding can explain educational outcomes (Zajacova, Lynch, &Espenshade, 2005). Our results add more depth to the understanding of to these relationships by revealing that they are at least partially mediated by academic persistence, thus pinpointing one of the psychological mechanisms of these effects: the aforementioned psychological and educational variables foster students' academic persistence, which in turn are associated with more positive educational outcomes.

Our final research question refers to the comparison between IB students and equivalent non-IB students in Romanian schools in what regards the relationships of academic persistence and its associated traits and educational strategies with the relevant educational outcomes. We found that the effects of the educational strategies on students' academic persistence are weaker than in the IB environment. Thestrategy that emerged as having the strongest effect on non-IB students' academic persistence is independent work style. In the Romanian educational system, students seem to be most persistent when they are encouraged to work on their own, when their success or failure is contingent only on their own work. Several authors state that students need an environment in which they do not feel controlled but are stimulated to work freely (Kohn, 2011). However, the primary use of this strategy, to the detriment of others, may lead to long term negative effects such as low school engagement, associated with decreased academic persistence (Appleton,

Christenson & Furlong, 2008). Moreover, previous studies have shown that students' academic persistence is best stimulated through a synergy of school strategies. For instance, in a meta-analysis of over 800 papers, Hattie (2013) underlines the importance of classroom size and management, teacher-student relationships, teacher's specific teaching strategies and curricula on students' educational achievement.

Similarly, as opposed to the IB students, in which all individual psychological traits analyzed were found to be associated with academic persistence, in the non-IB students only four such associations were significant. Critical thinking and restraint, which are among the most important individual personality traits associated with increased academic persistence in the IB group, did not correlate with academic persistence in the non-IB group. This finding is also in accordance with previous studies that have found that the Romanian traditional school system lacks the means to encourage student's curiosity and mostly rewards memorization (Nita, 2013). In such a context that discourages students' originality and values the exact reproduction of learnt material, the students' academic persistence seems to be associated with other personality traits. Specifically, as our result show, non-IB students' academic persistence is most associated with their proactive attitude. Students with a proactive attitude have a sense of control over their education and believe that they are solely responsible for their success or failure. They prefer to work independently, setting their own goals, and they believe that school has limited influence on their future (Harvey, Blouin & Stout, 2006). It seems that, in the context of a traditional educational system that still overuses coercive measures, and does not support students' creativity and where students' perceive their teachers as being disengaged (Nita, 2013), the most persistent are those students who are used to work on their own and who believe that they are solely responsible for their education and future.

In our mediation analyses, we found that the only educational strategy associated with non-IB students' academic performance was independent work style and this relationship was mediated by students' academic persistence. This result further suggests that the students who have the capacity to work on their own and develop various skills independently are the ones most likely to thrive in the Romanian public schools. On the other hand, students' proactive attitudes, although significantly predicting their

academic persistence, have no further effect on their academic performance, a result suggesting the traditional educational system does not reward proactive individuals. Somehow paradoxically, the most academically persistent non-IB students also tend to have the most proactive attitudes, but this attitude doesn't translate into higher school grades. This pattern of results suggests that the Romanian traditional school system is not consciously assuming the mission of developing students' proactivity, since this psychological trait is not externally reinforced through higher grades.

The generalizability of our findings is limited by the fact that we only used Romanian students as a control group; further studies could test the cultural variability of these effects by comparing IB students to non-IB students enrolled in traditional school systems in other countries. Overall, our results show that the IB DP programme fosters students' academic persistence to a higher degree than the traditional educational system (at least the Romanian one) does. This effect is mostly due to a set of distinct strategies that stimulate this trait both directly and indirectly, especially through the development of certain psychological skills supporting academic persistence, as well as through its curricula.

To conclude, our results suggest that IB DP students' academic performance and intention to dropout are associated to a complex set of educational strategies promoted in this environment, especially the curricula focused on the real, practical needs of students, as well as to certain personality traits, among which students' mastery goals, restraint and general self-efficacy were found to be especially conducive to academic performance. Moreover, these influences of the two types of factors on the two academic outcomes, i.e. performance and dropout intentions, were fully or partially mediated by academic persistence. The pattern of relationships that emerged in the traditional Romanian schools is quite different, with fewer significant relationships between these dimensions and with independent work style as the sole educational strategy influencing students' academic persistence and its consecutive outcomes. Thus, our findings could be relevant in providing specific guidelines in the process of designing educational policies and strategies. Among others, they suggest that the traditional Romanian school system would strengthen the support they offer to students' academic

persistence and, consequently, their academic success by enlarging its set of instructional approaches applied in the classroom setting and by emphasizing the strategies that our results from the IB DP environment pinpoint as highly effective in this endeavor.

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