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The Contributions of Psychological Maturity and Personality in the Prediction of Adolescent Academic Achievement

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Abstract

Numerous studies show that intelligence and impulsiveness are important predictors of academic achievement in adolescence. However, it is not clear what contribution is made by the big five personality traits, because some studies suggest that Conscientiousness, Extraversion and Openness to experience are predictors while others show precisely the opposite. Direct aggression, through its relationship with impulsiveness, is another factor that has been linked to academic achievement. However, no previous studies have been made on the relationship that indirect aggression and psychological maturity have with academic achievement. For this reason, the purpose of this study is to determine the relative importance of psychological maturity, indirect aggression and the big five personality traits in predicting academic achievement in adolescents. As was expected, results show that intelligence and impulsivity are important predictors of academic performance. As far as psychological maturity is concerned, only the Work orientation component is related to academic performance. However, indirect aggression is not related to academic performance. The results pertaining to the big five personality traits suggest that Conscientiousness and Openness to experience are important for predicting academic achievement.

Keywords: academic achievement, psychological maturity, personality, indirect aggression.

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La Contribución de la Madurez Psicológica y de la Personalidad en la Predicción del Rendimiento Académico de los Adolescentes

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Resumen

Numerosos estudios muestran que la inteligencia y la impulsividad son predictores del rendimiento académico en la adolescencia. Sin embargo, no está claro cuál es la contribución de los cinco grandes factores de personalidad, ya que mientras algunos estudios sugieren que Responsabilidad, Extraversión y Apertura a la experiencia son predictores, otros estudios muestran lo contrario. Otro factor que se ha relacionado con el rendimiento académico es la agresividad directa, a través de su relación con la impulsividad. Sin embargo, no existen estudios previos sobre la relación entre agresividad indirecta, madurez psicológica y rendimiento académico. Por tanto, el objetivo del presente estudio consiste en determinar cuál es la importancia relativa de la madurez psicológica, la agresividad indirecta y los cinco grandes factores de personalidad en la predicción del rendimiento académico en adolescentes. Como se esperaba, los resultados muestran que la inteligencia y la impulsividad son importantes predictores. En cuanto a la madurez psicológica, sólo el componente de Orientación al trabajo está relacionado con el rendimiento académico. Sin embargo, la agresividad indirecta no es un predictor. Respecto a los cinco grandes factores de personalidad, los resultados sugieren que Responsabilidad y Apertura a la experiencia son relevantes en la predicción el rendimiento académico.

Palabras clave: Rendimiento académico, madurez psicológica, personalidad, agresividad indirecta.

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The high rates of academic failure have been a matter of social concern in recent decades. For this reason, there has been increasing interest in identifying those variables that are related to academic achievement so that academic failure can be prevented. The current study focuses on the extent to which psychological maturity and personality traits contribute to the prediction of academic achievement.

A considerable number of studies show that intelligence is one of the most important predictors of academic performance (e.g., Laidra, Pullmann & Allik, 2007; Rosander, Bäckström & Stenberg, 2011; Steinmayr & Spinath, 2009; Strenze, 2007). The amount of variance in academic performance explained by intelligence depends on the level of education (see Jensen, 1980). In fact, Jensen (1980) reported correlations between .60 and .70 in elementary school, correlations of .50 in secondary school, and correlations of .40 at university. This decrease in the correlation between intelligence and academic achievement with age could be explained by the restriction of range because fewer people study at higher educational levels (Pind, Gunnarsdóttir & Jóhannesson, 2003).

Many authors state that personality variables should also be taken into account in the prediction of academic achievement (e.g., Chamorro-Premuzic & Furnham, 2005; Poropat, 2009; Rindermann & Neubauer, 2001). One of the personality traits that has been most consistently related to academic achievement is impulsivity (e.g., Romano, Babchishin, Pagani & Kohen, 2010; Valiente, Eisenberg, Spinrad, Haugen, Thompson & Kupfer, 2013; Vigil-Colet & Morales-Vives, 2005). In fact, impulsivity seems to be inversely related to academic performance and associated with learning problems (Fink & McCown, 1993). Therefore, high impulsivity in adolescence is related to higher academic failure (Vigil-Colet & Morales-Vives, 2005). It seems that impulsivity is a moderator variable in the relationship between intelligence and academic achievement, because students with greater intellectual capacity perform better academically if

they have low levels of impulsivity than if they have high levels (Helmers, Young & Pihl, 1995; Zeidner, 1995). One possible explanation might be that impulsive students are more likely to participate in behaviours without sufficient reflection, engaging in actions that may generate immediate gratification at the expense of future achievement (Block & Block, 1980; Eisenberg, Spinrad & Eggum, 2010). Moreover, students with worse academic performance might be characterized by impulsive styles in the resolution of problems, tending to provide quick answers with little thought, which can lead to error in those cases in which the response requires reflection (Fink & McCown, 1993).

Other studies have focused on the relationship between the Big Five personality traits and academic achievement (e.g., Chamorro-Premuzic & Furnham, 2003a; Komarraju, Karau & Schmeck, 2009; Wagerman and Funder, 2007). The trait most clearly related to academic performance is Conscientiousness (e.g., Chamorro-Premuzic & Furnham, 2003b; Heaven & Ciarrochi, 2012; Rosander, Bäckström & Stenberg, 2011), possibly because students with high responsibility are good at organizing their work and time, and tend to be more hard-working (Entwistle, 1997). Openness to experience also seems to be positively related to academic performance (e.g., Geisler-Brenstein & Schmeck, 1996; Komarraju, Karau & Schmeck, 2009), but according to McCrae and Costa (1985) this is due to the relationship between Openness to experience and intelligence, making it difficult to know whether the relationship between Openness to experience and academic performance is direct or indirect. This trait is also related to better scores in vocabulary and general knowledge (Ackerman & Heggestad, 1997; Ashton, Lee, Vernon, & Jang, 2000). However, other studies failed to replicate the relationship between Openness to experience and academic achievement (Chamorro-Premuzic & Furnham, 2003a; Rothstein, Paunonen, Rush & King, 1994). In general, no significant relationship has been found between the trait Agreeableness and academic performance (De Fruyt & Mervielde, 1996; Rothstein et al., 1994). For the traits Emotional stability

and Extraversion, results are contradictory: while some authors find a negative relationship, others find a positive relationship (Chamorro-Premuzic & Furnham, 2003a,b; Chowdhury, 2006; Heaven & Ciarrochi, 2012; Rosander, Bäckström & Stenberg, 2011; Swanberg & Martinsen, 2010). It should be taken into account that personality and academic performance may be associated because of their relationship with intelligence, as Poropat suggests (2009). Therefore, if the relationship between personality and academic performance is to be understood, the role of intelligence must be taken into account. However, some studies do not include the variable intelligence, which could partially explain the contradictory results found for some personality traits.

Few studies focus on the relationship between aggression and academic performance (Morales-Vives, 2007; Nakamoto & Schwartz, 2010). It seems that direct aggression is related to academic performance through impulsivity (Morales-Vives, 2007). In fact, McMurran, Blair and Egan (2002) stated that impulsivity can make learning more difficult in the early developmental years and lead to poor problem-solving in later years, which contributes to aggression. As far as we know, there are no studies on the relationship between indirect aggression and academic performance. While direct aggression refers to overt verbal attacks (for example, threatening, insulting or taunting) and physical acts (pushing or hitting), indirect aggression implies harming a target by rejection or exclusion, damaging his/her social position and manipulating peer relationships (for example, gossiping, spreading false rumours or ostracising), without directly confronting the victim (Bjorkqvist, Österman & Kaukiainen, 1992). According to Björkqvist, Lagerspetz & Kaukiainen (1992), indirect aggression depends on maturation, because a certain level of both verbal and social skills is needed. Taking into account that indirect aggression involves more maturation and verbal skills than direct aggression and it may involve more planning, it could also be related to academic performance, as direct aggression is.

Finally, there is evidence to suggest that there is a relationship between maturity and educational attainment: those students with fewer educational aspirations tend to be less mature (Greenberger, 1982). Therefore, psychological maturity may lead to greater interest in academic content and learning, as well as higher aspirations in life. Moreover, according to Galambos, MacDonald, Naphtali, Cohen & de Frias (2005) there is a relationship between cognitive ability and psychological maturity. They found that psychological maturity is related to a higher crystallized intelligence and better performance on some executive tasks. Taking into account that crystallized intelligence depends on learning processes, psychological maturity and academic performance are expected to be related. The very few studies on this issue suggest that this is the case (Steinberg, Elmen & Mounts, 1989; Oh-Hwang, 1994). However, these studies do not assess intelligence, so other studies need to be made to determine whether this result can be explained simply by the relationship that psychological maturity and academic performance have with intelligence.

In the current study we define psychological maturity as the ability to take on obligations, to make responsible decisions that take into account one's own characteristics and needs, and to accept the consequences of one's own actions. This definition refers specifically to the individual adjustment proposed by Ellen Greenberger and colleagues (e.g., Greenberger, 1984; Greenberger & Sørensen, 1973) within their model of psychosocial maturity, which is divided into three components: Work Orientation, Self-Reliance and Identity. Work Orientation is defined as the individual's willingness to fulfill his or her own obligations (for example, adolescents start their homework and do not stop until they finish). Self-Reliance is defined as a person's willingness to take the initiative, without allowing others to exercise excessive control. And finally, Identity is defined as the adolescent's knowledge of him or herself.

The aim of the current study is to determine the contribution that psychological maturity and several personality traits make to the prediction of adolescent academic performance. The personality traits included in this study are impulsivity, indirect aggression and the Big Five (Extraversion, Conscientiousness, Emotional stability, Agreeableness and Openness to experience). Taking into account the results of previous studies, we expect intelligence and impulsivity to be important predictors of academic performance. With regard to the Big Five personality traits, we also expect Conscientiousness and Openness to experience to be related to academic performance. Despite the few studies that have focused on indirect aggression and psychological maturity, we expect that these two traits will also be related to academic performance, particularly the component Work-orientation of psychological maturity.

Methods

Participants

This study involved the participation of 232 students (109 boys and 123 girls) from two Spanish high schools, in Reus (Tarragona, Spain). The participants were between 14 and 19 years old, and the mean age and standard deviation were 15.5 and 1.3, respectively.

Measures

Primary Mental Abilities (Thurstone, 1938). This questionnaire measures the following components of intelligence: Verbal (PMA-V), Spatial (PMA-s), Numerical (PMA-N), Reasoning (PMA-R) and Word Fluency (PMA-W). PMA-V is defined as the capacity to understand ideas expressed in words. PMA-S is the capacity to imagine and think of objects

in two or three dimensions. PMA-N is the ability to handle numbers and solve numerical problems. PMA-R is the ability to solve logical problems, as well as understanding and planning. PMA-W is the ability to speak and write words easily.

Psychological Maturity Assessment Scale (PSYMAS; Morales-Vives, Camps & Lorenzo-Seva, 2012, 2013). This questionnaire measures three components of psychological maturity: Work orientation (WO), Self-reliance (SR) and Identity (ID). It consists of 26 items, and it includes four items of social desirability to control for this response bias. In fact, this inventory provides individuals' scores free of the following response biases: social desirability and acquiescence. Item responses are made using a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The reliability of the total scale is .82 and the reliability of the subscales are .71 for WO, .78 for SR and .77 for ID. The scales are just seven items long, so these reliabilities can be regarded as adequate.

Impulsivity Scale Bis-11c (Chahin, Cosi, Lorenzo-Seva & Vigil-Colet, 2010). This questionnaire is a modified Spanish version of Barratt's BIS-11 (Barratt, 1985) adapted for children and teenagers. The questionnaire contains 26 items that measure three components of impulsiveness: Motor Impulsiveness (BIS-m), Cognitive Impulsiveness (BIS-c), and Non-Planning Impulsiveness (BIS-np). BIS-m involves acting without thinking, BIS-c a propensity to make quick cognitive decisions on the spur of the moment, and BIS-np a tendency not to plan, which show a greater interest in the present than in the future. Item responses are made using a 4-point Likert-type scale ranging from 1 (never / almost never) to 4 (always / almost always).The internal consistencies of the subscales are .80, .73, and .68, respectively.

Overall Personality Assessment Scale (OPERAS; Vigil-Colet, Morales-Vives, Camps, Tous & Lorenzo-Seva, 2013). This questionnaire is based on the five-factor model of personality, and it measures the following traits: Extraversion (EX), Emotional Stability (ES), Conscientiousness (CO), Agreeableness (AG) and Openness to Experience (OE). The questionnaire

contains 40 items, and the reliability of the subscales are .86 for EX and ES, .77 for CO, .71 for AG and .81 for OE. These scales are just seven items long, so these reliabilities can be regarded as adequate. Responses are made on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). This questionnaire includes four items of social desirability to control for this response bias and it provides individuals' scores free of social desirability and acquiescence.

Indirect Aggression Scales (IAS; Anguiano-Carrasco & Vigil-Colet, 2011). We administered the short version for aggressors. Indirect aggression refers to social manipulation behaviors in which the aggressor acts on the people around the attacked person with the sole aim of harming him/her without facing him/her directly. This inventory consists of 10 items answered on 5-point Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire has an internal consistency of .82. The social desirability response bias was controlled.

Academic performance was assessed by the average grades obtained in school subject areas.

Procedure

The tests were administered collectively to groups of 20–30 participants by a professional psychologist with master's degrees in the measurement and assessment of behaviour. This psychologist was specially trained to administer questionnaires to adolescents. The participants were asked to volunteer to answer the inventories in their classroom. The anonymity and confidentiality of individual results was guaranteed.

Statistical analyses were carried out using SPSS V.20 and MIMR-Raw (Lorenzo-Seva, Ferrando & Chico, 2010). We performed descriptive analysis, correlations and multiple regression analysis to determine the predictive value of the different variables on academic performance. Standardized coefficients (also known as beta weights) are context dependent (Courville & Thompson, 2001) and often do not work well for

explanatory purposes, especially in the presence of substantially correlated predictors, in which case they can also become very unstable (Cooley & Lohnes, 1971; Johnson, 2000). Moreover, multicollinearity can also affect the magnitude of beta weights. For this reason, taking into account that the predictors from the current study are correlated, we used additional indexes to assess the relative importance of these predictors: Johnson's structural coefficients and relative weights (Johnson, 2000). Johnson's relative weights, for example, estimate the relative contribution each variable makes to the prediction of a dependent variable, taking into account both its individual contribution and its contribution when combined with other variables. MIMR-Raw.sps provides the relative weights as percentages (i.e., they are divided by R^2 and multiplied by 100). It also calculates the bootstrap confidence intervals for the relative weights. These additional indexes make it easier to interpret multiple regression results in the presence of multicollinearity (Kraha, Turner, Nimon, Zientek & Henson, 2012).

Results

Table 1 shows the descriptive statistics for the PMA, BIS-11c, PSYMAS, IAS and OPERAS measures. As can be seen, girls had a better academic performance ($t(230) = 2.08$, $p < .05$, Cohen's $d = 0.27$) and higher scores on Agreeableness ($t(230) = 2.42$, $p < .05$, Cohen's $d = 0.32$), Openness to experience ($t_{(230)} = 3.61$ $p < .01$, Cohen's $d = 0.48$), PMA-R ($t(230) = 2.65$, $p < .01$, Cohen's $d = 0.35$) and PMA-N ($t(230) = 2.26$, $p < .05$, Cohen's $d = 0.30$). However, boys obtained higher scores on Emotional stability ($t(230) = 4.27$, $p < .01$, Cohen's $d = 0.56$).

Table 1
Descriptive Statistics

		All	Boys	Girls
	Scales	*M (SD)*	*M (SD)*	*M (SD)*
	AP	5.8 (1.4)	5.6 (1.3)	5.9 (1.4)
PSYMAS	WO	49.3 (9.9)	49.1 (9.9)	49.5 (10.1)
	SR	46.9 (12.3)	47.3 (13.5)	46.5 (11.3)
	ID	49.9 (9.8)	50.6 (9.3)	49.1 (10.3)
	Total	48.3 (10.7)	48.8 (10.8)	47.9 (10.7)
BIS-11c	BIS-m	25.9 (6.0)	25.7 (6.3)	26.1 (5.7)
	BIS-c	12.1 (2.6)	12.4 (2.5)	11.9 (2.7)
	BIS- np	18.4 (4.8)	18.1 (4.9)	18.7 (4.7)
IAS	IA	50.8 (10.4)	52.1 (10.9)	49.7 (9.8)
OPERAS	EX	49.1 (10.0)	48.5 (9.3)	49.7 (10.7)
	CO	43.3 (11.1)	42.7 (10.8)	43.8 (11.4)
	ES	46.0 (11.1)	49.2 (10.4)	**43.2** (11.4)
	AG	47.0 (11.0)	45.2 (10.7)	*48.7* (10.9)
	OE	42.9 (11.4)	40.1 (10.7)	**45.4** (11.5)
PMA	PMA-V	20.6 (6.7)	20.3 (6.5)	20,9 (6.9)
	PMA-S	24.7 (12.9)	25.3 (12.5)	24.2 (13.3)
	PMA-N	39.3 (11.0)	10.8 (7.3)	*12.9* (6.6)
	PMA-R	16.8 (6.7)	15.5 (6.9)	**17.8** (6.4)
	PMA-W	39.3 (10.9)	38.1 (11.2)	40.3 (10.8)

Note. AP = Academic performance, EX = Extraversion, ES = Emotional Stability, CO = Conscientiousness, AG = Agreeableness, OE = Openness to experience, WO = Work orientation, SR = Self-reliance, ID = Identity, IA = Indirect aggression, BIS-c = Cognitive impulsiveness, BIS- np = non-planning Impulsiveness, BIS-m = motor impulsiveness, PMA-V = Verbal, PMA-S = Spatial, PMA-N = Numerical, PMA-R = Reasoning, PMA-W = Word Fluency.
p < .05 **p < .01**

The correlations between the study variables are shown in Table 2. There is a signification correlation between academic performance and two personality factors: Conscientiousness and Openness to experience. Academic performance is also correlated with all the scales of impulsivity and intelligence, and one scale of psychological maturity: Work orientation.

Table 2

Correlations between Variables

	AP	EX	ES	CO	AG	OE	WO	SR	ID	IA	BIS-c	BIS-np	BIS-m	PMA-V	PMA-S	PMA-R	PMA-N
EX	-.13																
ES	.06	**.29**															
CO	**.23**	.07	**.27**														
AG	.01	-.01	**.23**	**.36**													
OE	**.29**	.02	.00	**.30**	.07												
WO	**.27**	.10	**.21**	**.48**	**.21**	**.21**											
SR	.04	.16	**.22**	**.26**	.05	.12	**.27**										
ID	.07	**.36**	**.58**	**.31**	**.23**	.05	**.33**	**.32**									
IA	-.07	.05	-.05	**-.20**	**-.39**	-.07	-.11	**-.19**	-.17								
BIS-c	**.19**	**.21**	**.25**	**.26**	.05	.15	**.29**	**.23**	**.19**	.01							
BIS-np	**-.20**	.04	-.17	**-.55**	-.12	**-.28**	**-.23**	-.11	-.12	-.02	**-.13**						
BIS-m	**-.28**	.17	**-.33**	**-.49**	**-.36**	**-.23**	**-.36**	-.13	**-.29**	**.20**	-.09	**.29**					
PMA-V	**.32**	-.06	.03	.09	-.02	**.26**	.14	**.22**	.04	-.02	**.23**	-.14	-.14				
PMA-S	**.23**	.12	.12	.03	-.04	.13	.08	.13	.09	-.05	**.21**	-.03	-.07	**.36**			
PMA-R	**.36**	.12	.10	.07	.18	**.23**	**.21**	.12	.15	**-.22**	**.19**	.01	**-.24**	**.40**	**.51**		
PMA-N	**.24**	.10	.09	.01	.15	.03	.11	.11	.17	-.14	**.24**	.07	-.13	**.25**	**.20**	**.32**	
PMA-W	**.25**	.10	.03	.08	-.03	**.31**	.16	.18	.03	.00	.13	-.05	-.12	**.48**	**.30**	**.34**	**.25**

Note. AP = Academic performance, EX = Extraversion, ES = Emotional Stability, CO = Conscientiousness, AG = Agreeableness, OE = Openness to experience, WO = Work orientation, SR = Self-reliance, ID = Identity, IA = Indirect aggression, BIS-cog = Cognitive impulsiveness, BIS-np = Non-planning Impulsiveness, BIS-motor = Motor impulsiveness, PMA-V = Verbal capacitiy, PMA-S= spatial, PMA-R = reasoning, PMA-N = Numerical capacity.

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

A multiple regression analysis was carried out using the programs SPSS and MIMR-Raw.sps. All the subscales were introduced into the regression equation as potential predictors of academic performance. Table 3 shows the standardized regression coefficients (Beta) obtained, the structure coefficients, Johnson's relative weights and the bootstrap confidence intervals. The R^2 was .57 (F = 10.42, p < .001) and the 95% confidence interval was .52 and .69. Only nine predictors (Extraversion, Conscientiousness, Openness to experience, Work orientation, BIS-cog, BIS-np, BIS-m, PMA-R and PMA-N) turned out to have a significant Beta (p< .01), and also significant structure coefficients, with bootstrap 95% confidence intervals that did not include the zero value. Although the Beta of BIS-np, PMA-V, PMA-S and PMA-W were not significant, the fact that the structure coefficients and Johnson's relative weights were significant suggests that they should be included in the model as well, because they contribute significantly to the prediction of academic performance. The relative contribution to Multiple R for each predictor ranges between 26.6 and 9.5, as the last column in Table 3 shows.

Table 3
Structural Coefficients and Relative Weights of Johnson

				Bootstrap 95% C.I. for SC 95%)			Bootstrap 99% C.I. for RW	
	Scales	Beta	SC	Lower	Upper	RW	Lower	Upper
	EX	-.21	-.23	-.39	-.03	7.6	1.5	16.5
OPERAS	CO	.18	.41	.18	.57	5.9	1.7	12.7
	OE	.16	.52	.30	.64	10.2	2.2	19.8
PSYMAS	WO	.13	.48	.26	.61	8.9	2.2	17.2
	BIS-c	.05	.34	.11	.49	3.3	0.5	9.5
BIS-11c	BIS-np	-.07	-.36	-.50	-.15	4.7	0.8	11.8
	BIS-m	-.05	-.48	-.63	-.26	6.4	1.5	14.9
	PMA-V	.09	.57	.30	.71	9.8	1.9	20.4
	PMA-S	.02	.40	.19	.56	4.6	1.5	11.4
PMA	PMA-R	.29	.63	.44	.72	17.6	6.5	26.6
	PMA-N	.17	.41	.20	.58	8.9	1.2	19.3
	PMA-W	.04	.45	.27	.56	5.4	1.5	11.9

Note. SC = Structure coefficient, C.I. = Confidence interval, RW = Relative weight (reported as percentages), EX = Extraversion, CO = Conscientiousness, OE = Openness to experience, AG = Agreeableness, WO = Work orientation, BIS-c = Cognitive impulsiveness, BIS-np = Non-planning impulsiveness, BIS-m = Motor impulsiveness, PMA-V = Verbal capacity, PMA-S = Spatial capacity, PMA-R = Reasoning, PMA-N = Numerical capacity, PMA-W = Word fluency.

Discussion

As Rosander et al. (2011) pointed out, teachers need to know which variables are related to academic performance if they are to implement new teaching methods adjusted to the specific psychological characteristics of students. For this reason, the current study aims to determine the contribution of psychological maturity and several personality traits to the prediction of adolescent academic performance.

In general, the results are consistent with those of previous studies in the domain of impulsivity and intelligence. More specifically, the results show that both psychological maturity and personality traits are important predictors, as previous studies have shown (Busato, Prins, Elshout & Hamaker, 2000; Fink &McCown, 1993; Vigil-Colet & Morales-Vives, 2005). In fact, the current study shows that the three kinds of impulsivity are predictors, but Motor impulsiveness is more influential than the others.

The Work orientation component of psychological maturity is also a predictor of academic performance, as was expected. In fact, previous studies seem to suggest that more mature adolescents tend to show better cognitive and academic performance (Steinberg, Elmen & Mounts, 1989; Oh-Hwang, 1994). Moreover, responsible students may spend more time on their homework and academic activities, and therefore tend to achieve more at school. However, Identity and Self-reliance are not relevant predictors. As far as we know, no previous studies have focused on the role of Self-reliance, but some studies have shown that Identity is related to academic performance (e.g., Berzonsky, & Kuk, 2005; Lounsbury, Huffstetler, Leong & Gibson, 2005). Many of these studies, however, do not control for the effect of intelligence, which may affect the interpretation of the results.

Contrary to our expectations, Indirect aggression did not contribute incrementally to the prediction of academic performance. The fact that the correlation is non-significant suggests that it is neither a direct nor an indirect predictor. However, a previous study shows that direct aggression (involving overt verbal and physical attacks) is an indirect predictor of academic failure, through its relationship to impulsivity (Morales-Vives, 2007).

As expected, results on the Big Five personality traits show that Conscientiousness and Openness to experience are important predictors of academic performance. Previous research also shows the importance of these predictors (Busato et al., 2000; Heaven & Ciarrochi, 2012; Rosander, Bäckström & Stenberg, 2011; Komarraju, Karau & Schmeck, 2009). In the current study Openness to experience is the Big Five personality trait that makes the greatest relative contribution to the prediction of academic performance, and its contribution is even higher than that of impulsiveness. Contrary to what McCrae and Costa (1985) suggest, the results show that the relationship between Openness to experience and academic performance cannot be explained merely by the relationship between Openness to experience and intelligence, because this trait explains part of the variance that is not explained by intelligence. Therefore, the relationship between Openness to experience and academic performance may be explained by the fact that individuals who are more open to experience are more curious and engage in particular intellectual activities. These individuals may be more involved and interested in their studies and academic activities. Previous studies have provided contradictory results on the role of Extraversion: while some have found that it is positively related to academic performance (Furnham & Medhurst, 1995; Rothstein et al., 1994), others have found a negative relationship (Goff & Ackerman, 1992) or no relationship at all (Diseth, 2003). However, the current study shows that it is an important predictor, with a negative relationship. Therefore, less extrovert students tend to show better academic performance. Eysenck and Cookson (1969) stated that the correlation between this personality trait and academic performance changes from positive to negative during secondary school, because the atmosphere in primary school is more social and informal than in

secondary school. This may explain the sign of the relationship in the current study (because the students are from secondary school). Moreover, introverts may have an advantage in the consolidation of learning, lower distractibility and better study habits (Sánchez, Rejano & Rodríguez, 2001). Emotional stability and Agreeableness do not contribute to the prediction of academic performance, as previous studies suggest (De Fruyt & Mervielde, 1996; Rothstein et al., 1994).

In conclusion, the current study discusses some of the variables that must be taken into account when predicting academic performance. According to the results, students who are more impulsive and extroverted, but less work oriented, conscientious and open to experience tend to have more difficulties, so they may require special attention to be paid to their particular needs. However, further studies should be made to replicate these results, because few previous studies have focused on the possible role of indirect aggression and psychological maturity. Moreover, further longitudinal and sequential studies are also needed to broaden the perspective on the relationship between these variables, and their evolution throughout the secondary school and university.

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