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ACADEMIC ACHIEVEMENT OF COLLEGE STUDENTS: THE ROLE OF THE POSITIVE PERSONALITY MODEL

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Abstract

This research aimed at testing an explicative model of academic achievement of college students. Positive personality traits were hypothesized as the main predictors. Mental health and academic adjustment were tested as mediator variables. This model intended to reflect the main hypothesis that academic achievement is multi-determined and non-intellectual variables play an important role in explaining it. Sample was composed of 256 college students of different majors. The results obtained highlighted the importance of differentiating subjective and objective academic achievement in terms of academic adjustment (AA) and grade point average (GPA), respectively. The explicative model that included positive traits as background variables confirmed the mediating role of mental health and AA in explaining GPA. Sprightliness was the most important predictor of academic achievement in comparison to the other positive traits studied. It is concluded that positive personality traits play an important role in academic outcomes.
Keywords: *academic adjustment, academic achievement, personality traits, positive traits.*

Introduction

It is common knowledge that personality traits determine great part of individual's outcomes in many areas. Their role in academic performance has been mostly outlined by the analysis of the so-called "normal" personality traits such as those included in the Five Factor Model (Costa & McCrae, 1985). In contrast, the role of *positive personality traits* is not so clear, especially since these positive traits are known to influence many other variables thought to mediate the relation with academic performance (e.g. well-being, psychological symptoms). The interest in predicting academic achievement is not new and in the last decades, it has shifted from the study of intellectual predictors to the analysis of non-intellectual factors such as social support, personality traits and motivation.

Nowadays the world is more educated than ever before (World Economic Forum, 2017). Worldwide, this has been related to very tangible and positive results. When the population is more educated, women tend to be more prepared and consequently, child mortality decreases, citizens earn more money and are more likely to incur in prosocial behaviors, countries have higher chances of having democratic political regimes and economic growth, among others (Roser & Ortiz-Ospina, 2018). However, graduation rates remain a worrying matter (Organization for Economic Cooperation and Development, 2018) and investment in public policies and research in education seems to be fundamental for any country. Any decision made in this direction should be well-informed and based on clear research precedents. It is because of this that questions as the following may arise: How is it better to intervene in order to guarantee academic attendance and graduation? Given that college drop-outs (especially in the first two years of college) are negatively related to academic performance (e.g., Gershenfeld, Hood, &

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Zhan, 2016; Kirby & Sharpe, 2001; Westrick, Le, Robbins, Radunzel, & Schmidt, 2015), aiding students so that they perform better seems to constitute a significant matter to focus on.

Which variables better predict academic achievement? For many years, predicting academic achievement has been a matter of interest for scholars in the fields of psychology and education (Richardson, Abraham, & Bond, 2012). Initial approaches focused on identifying intellectual variables such as intelligence and different cognitive abilities. Certainly, evidence indicates that intellectual constructs are related to academic achievement (e.g. Duncan et al., 2007). However, research shows that non-intellectual aspects match and even outdo IQ measures when predicting academic performance (e.g. Duckworth, & Seligman, 2005; Lechner, Danner, & Rammstedt, 2017; Poropat, 2009; Trapmann, Hell, Hirn, & Schuler, 2007). More importantly, when comparing intellectual variables with non-intellectual variables in the long term, the predictive power of the former over success out of school, is weak (Sternberg, Wagner, Williams, & Horvath, 1995). Eventually, the focus of research interest has shifted from intellectual to non-intellectual aspects such as social support (e.g., Domagala-Zysk, 2006), motivation (e.g., Stover, Freiberg Hoffmann, de la Iglesia, & Fernández Liporace, 2014), personality traits (e.g., Poropat, 2009), and many others.

In most studies, academic achievement is measured by grade point averages (GPA), the most widely used measure of achievement (Richardson et al., 2012). Other researchers have focused on academic adjustment (AA), which refers to the degree students feel they fit into the academic environment (Ramsay, Jones, & Barker, 2007; van Rooij, Jansen, & van de Grift, 2018). More specifically, it involves how students conceptualize their academic goals, their motivation to learn, their interplay with the academic environment and how they perceive their academic performance (Anderson, Guan, & Koc, 2016; Baker, & Siryk, 1984).

Intrinsically, GPA and AA are of different nature, one is objective and the other one is subjective (Hazan Liran, & Miller, 2019). AA is centered on students' perception of their academic performance, and thus, it does not necessarily represent real achievement. Studies have found that AA is positively related to GPA (Brady-Amoon & Fuertes, 2011; Credé & Niehorster, 2012; Perera & DiGiacomo, 2015; Perera, McIlveen, & Oliver, 2015) and AA has been identified as a pivotal variable in predicting GPA (Bailey & Phillips, 2015; Rinties, Beausaert, Grohnert, Niemantsverdriet, & Kommers, 2012; van Rooij et al., 2018). Additionally, some studies have found that AA functions as a mediator between background variables –such as stress and self-esteem– and achievement (Kamphorst, Hofman, Jansen, & Terlouw, 2012; Petersen, Louw, & Dum, 2009).

Psychological Variables Related to Academic Achievement

Several studies have shown that psychological variables are related to AA and GPA. For instance, psychological symptoms such as negative affectivity, depression and anxiety are negatively related to AA (Bailey, & Phillips, 2015) and depressive symptoms are negatively related to GPA (Zychinski & Polo, 2012). Also, a global index of psychological symptoms was found to negatively predict AA (Kerr, Johnson, Gans, & Krumrine, 2004). On the other hand, some research states that well-being predicts GPA (Ayyash-Abdo & Sánchez-Ruiz, 2012; Berger, Alcalay, Torretti, & Milicic, 2011) even after controlling for IQ (Quinn & Duckworth, 2007). That is, both psychological symptoms and well-being seem to explain academic achievement to some degree.

Moreover, personality traits represent one of the main non-intellectual variables related to academic achievement. Some traits, as conceived by the FFM (Costa & McCrae, 1985), not only are related to but also predict academic achievement. In detail, conscientiousness is the FFM's trait that has consistently shown to be a significant positive predictor of academic achievement (Richardson et al., 2012). This relation has been found even independently of

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the role of intelligence (Duckworth & Seligman, 2005; Lechner et al., 2017; Poropat, 2009; Trapmann et al., 2007). Regarding the rest of the FFM's traits, evidence is not consistent. While some studies have found that agreeableness is positively related to achievement, but only when measured by behavioral assessments and not by self-reports (Poorthuis, Thomaes, Denissen, van Aken, & Orobio de Castro, 2014); other studies found that agreeableness is negatively related to achievement (Lechner et al., 2017). Similar results have been found for extraversion, openness to experience and emotional stability. Despite some research have found these traits to be negatively related to achievement, other studies have observed either a positively association or non-association with academic achievement at all (e.g. Lechner et al., 2017; Poropat, 2009; Trapmann et al., 2007).

On the other hand, positive traits such as the ones assessed by the Values in Action model (Peterson & Seligman, 2004) have been analyzed to test their relation to academic achievement. Some of the VIA's character strengths were related to academic achievement: self-regulation, fairness, prudence, judgement, love of learning, gratitude, perspective, perseverance and zest (Lounsbury, Fisher, Levy, & Welsh, 2009; Park & Peterson, 2008, 2009; Wagner & Ruch, 2015). Recently, in a study of positive traits, de la Iglesia and Castro Solano (2018) proposed the Positive Personality Model (PPM). This model is a sanity nosology of personality traits generated by stating the positive and reverse versions of the pathological personality traits proposed in section III of DSM-5 (American Psychiatry Association, 2013). Until now, the positive traits have been found to outperform the FFM in predicting job satisfaction, psychological well-being and overall mental health (a combination of low psychological symptoms and high psychological well-being) (de la Iglesia & Castro Solano, 2018, in press; de la Iglesia, Lupano Perugini, & Castro Solano, 2019). Since PPM explains psychological symptoms and well-being, both variables related to achievement, it would be of interest to study if the PPM's traits have an indirect effect on academic achievement.

Some studies have tested multivariate explicative models of achievement. Research as the one by Perera et al. (2015) concluded, by applying structural equation modelling, that conscientiousness and neuroticism played important roles in explaining GPA through their direct and indirect effects in coping styles and AA. Also, some studies have proposed the AA may have a mediating role between personality traits and academic performance measured by GPA (Perera & DiGiacomo, 2015; Perera et al., 2015). Considering the influence of personality traits in psychological symptoms and well-being, as well as their influence on academic performance in the presence of AA, it would be interesting to test an explicative model of academic achievement that includes all of the variables of the PPM's sanity nosology.

Therefore, the aim of this research was to analyze the role of PPM's traits in an explicative model of academic achievement. Since PPM's traits are related to psychological symptoms and psychological well-being (de la Iglesia & Castro Solano, in press), and psychological well-being and psychological symptoms affect academic achievement (e.g., Quinn & Duckworth, 2007; Kerr et al., 2004), both variables were considered as mediators. Regarding academic achievement measures, GPA was deemed as an objective measure of academic achievement affected by AA (Ayyash-Abdo & Sánchez-Ruiz, 2012; Berger et al., 2011). Therefore, the following model was hypothesized (see Figure 1).

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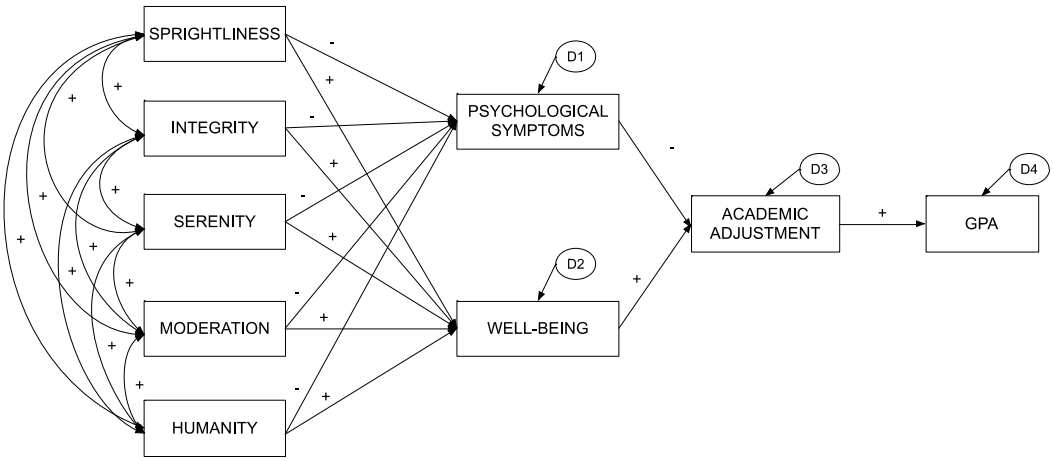

Figure 1. Hypothesized explicative model of academic achievement.

Given the aforementioned, the main research question revolves around whether positive personality traits predict objective academic achievement measured by GPA and what is the role of different mediator variables in that prediction. It is hypothesized that variations in mental health (well-being and psychological symptoms) and academic adjustment mediate the effect of positive traits on GPA.

Research Methodology

General Background

This research had a cross-sectional design. Data were collected by snowball sampling technique in Buenos Aires City in 2018. Participation was anonymous and voluntary. Participants were informed about the main objective of the research and the possibility to refuse or to suspend their participation at any moment. They were asked to give their informed and written consent. No incentives were given either to data collector or to participants. This research followed the ethical guidelines and was approved by the National Council for Scientific and Technical Research (CONICET), the University of Palermo and the University of Buenos Aires.

Sample

A non-probabilistic sample of 256 college students was studied (M_{AGE} = 27.55, *SD* = 3.39, 48.8% males, 51.2% females). Attendance to private and public colleges was equitable (50.4% public, 49.6% private). Regarding their studies, most of them (44.5%) were doing majors in social/humanities, 23.4% in exact/natural, 12.5% in art, 11.7% in technical 5.1% in teaching and 2.7% in agriculture-related majors. Most of the participants (87.5%) reported a middle socio-economic status, 19.9% a middle-high/high socio-economic status and 12.5% a middle-low/low socio-economic status. Regarding their marital status, most of them were single (54.3%), 21.1% were dating someone, 22.7% were either married or living with a partner, and 2% were divorced. Half of the sample (50%) lived with their parents, 25.4% lived with their own family, 21.9% lived alone or with friends, and 4% had other living arrangements. Most of the students (60.9%) were employed.

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Instruments and Procedures

Positive Traits Inventory-5 (de la Iglesia & Castro Solano, 2018). The PTI-5 is a measure of positive traits that assesses the positive versions of the pathological items proposed in section three of DSM-5 (American Psychiatric Association, 2013). It is composed of 60 items that have a 6-point Likert scale that ranges from 0 (*completely untrue*) to 1 (*completely true*). The five positive traits are: *Sprightliness* (17 items) assesses the characteristic of having clear life goals, high focus and energy to achieve them and a usual experience of well-being when pursuing those goals (e.g. "When I set my mind on something it is easy for me to put all my attention into achieving it"), *Integrity* (13 items) refers to the features of people who are trustworthy and honest, do not hesitate to admit their own mistakes, are humble and expect to be treated as everyone else (e.g. "I have flaws like everybody"), *Serenity* (13 items) contemplates an almost imperturbable peace and an excellent management of their own and others' negative emotions (e.g. "If somebody insults me or offends me, I try to stay calm"), *Moderation* (9 items) includes the characteristic of being cautious and foreseeing possible risks before making decisions, (e.g. "I usually avoid unnecessary risk taking"), and lastly *Humanity* (8 items) assesses the characteristic of being highly sensitive to the surroundings and have no trouble in showing this sensitivity to others, also, other's distress mobilizes them to act in order to help ending it (e.g. "Generally I help others"). The psychometric properties of this instrument have been studied in Argentinean population by exploratory and confirmatory factor analyses, convergent validity and internal consistency analyses. In this sample, internal consistency was Sprightliness = .92, Integrity = .86, Serenity = .89, Moderation = .88 and Humanity = .83.

Mental Health Continuum–Short Form (Keyes, 2005). The MHC–SF is a 14-item mental health measure that has a total score and three well-being subscales: psychological (e.g., "That my life has meaning and purpose"), social (e.g., "That people are good,") and emotional (e.g., "Happy,"). Items are answered on a 6-point Likert-type scale. In Argentina, it was psychometrically studied by Lupano, de la Iglesia, Castro Solano and Keyes (2017). Their analysis included confirmatory factor analysis (CFA) and analyses con internal consistency and external validity that indicated the appropriateness of the measure in that population. In this sample, only the total score was used, and its internal consistency was .88.

Symptom Checklist 27 (Hardt & Gerbershagen, 2001). The SCL-27 is a short version of SCL-90-R (Derogatis, 1975) that consists of 27 items that are answered in a 5-point Likert scale that ranges from 0 (*not at all*) to 4 (e*xtremely*). The SCL-27 has six scales of symptoms - depressive symptoms, dysthymic symptoms, vegetative symptoms, agoraphobic symptoms, symptoms of social phobia, and symptoms of mistrust- and a total measure -Global Severity Index (GSI)- that informs the person's current discomfort. In Argentina, its psychometric properties are currently under study. Therefore, a CFA was conducted in other to test the appropriateness of the total score. Estimation method was Maximum Likelihood and the polychoric matrix was used. Fit indexes showed an excellent fit of the model (*CFI* = .969, *RMSEA* = .066 (90% *CI* = .059 - .072). Also, Cronbach's alpha for the total score was .92.

Academic Adjustment Scale (Anderson et al., 2016). This is a measure of students' self-perception of adjustment to university life. The local Argentinean adaptation included five items that are answered in a 6-point Likert scale that ranges from 0 (*almost never*) to 5 (*always*). A single total score represents total adjustment, and in this sample, CFA indicated an excellent fit (*CFI* = .995, *RMSEA* = .062 (90% *CI* = .000 - .125). The obtained Cronbach's alpha for the total score was .784

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Data Analysis

Firstly, product-moment Pearson correlations were calculated in order to explore the relations among the variables included in the research. Then, multiple linear regressions were run to identify significant predictors of GPA and AA. Finally, a path analysis was hypothesized and tested using the information of the aforementioned analyses and the referred theoretical and empirical precedents. Correlation and multiple regression analyses fail to provide information about multivariate association and, thus, a path analysis would reflect a more global view of the phenomenon and a more accurate measure of each variables' contribution to the prediction of academic achievement (here operationalized by GPA and academic adjustment).

Research Results

As depicted in Table 1, GPA only shows statistically significant associations with academic adjustment and well-being. AA, on the other hand, was associated with all variables of the design, except with Integrity. As expected, well-being was positively related to AA and all positive traits, while psychological symptoms were negatively related to AA, and to Sprightliness and Serenity.

Table 1. Correlations among GPA, academic adjustment, well-being, psychological symptoms and PPM's traits.

	1	2	3	4	5	6	7	8	9
1. GPA	-								
2. Academic Adjustment	.33**	-							
3. Well-being	.13*	.33**	-						
4. Psychological Symptoms	-.06	-.38**	-.44**	-					
5. Sprightliness	.10	.40**	.65**	-.38**	-				
6. Integrity	.03	.16*	.30**	-.07	.56**	-			
7. Serenity	-.05	.15*	.42**	-.25**	.55**	.46**	-		
8. Moderation	-.04	.12	.14*	-.07	.37**	.37**	.57**	-	
9. Humanity	.10	.18**	.33**	-.01	.39**	.57**	.34**	.26**	-

Note. * < .05, ** < .01

A series of multiple linear regression analyses were run to test the explicative model of GPA and then an explicative model of AA, separately, including all non-academic variables as predictors (see Table 2). In the case of GPA, the model was not statistically significant ($p > .05$). Regarding AA, the model was statistically significant, and it explained 20% of the variance in AA.

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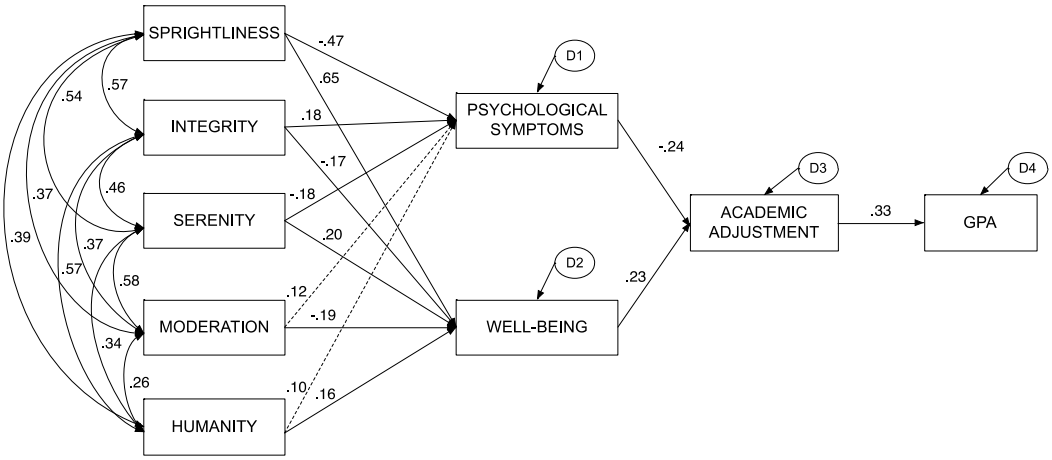
Table 2. Multiple linear regressions: explicative model of GPA and academic adjustment.

	R^2_{ADJ}	*F(gl)*	*p*	*β* Standardized	*p*
GPA					
Model	.019	1.71(7,248)	.105		
Psychological symptoms				-.020	.779
Well-being				.105	.236
Sprightliness				.107	.289
Integrity				-.043	.622
Serenity				-.174	.049
Moderation				-.010	.899
Humanity				.111	.157
Academic adjustment					
Model	.200	10.13(7,248)	< .001		
Psychological symptoms				-.218	.001
Well-being				.047	.559
Sprightliness				.354	< .001
Integrity				-.078	.326
Serenity				-.149	.061
Moderation				.048	.501
Humanity				.107	.132

The fit indexes obtained by robust maximum likelihood estimation indicated an excellent fit of the model (*CFI* = .959, *IFI* = .960, *RMSEA* = .088, 90% *CI* = .057 - .121). The model explained 10.8% of GPA's variance and 13.9% of AA's variance. As seen in Figure 2, the Sprightliness, Serenity and Humanity positive traits have positive direct effects on well-being. Conversely, Integrity and Moderation have negative direct effects on well-being. On the other hand, while Sprightliness and Serenity are negative predictors of the presence of psychological symptoms, Integrity is a positive predictor of psychological symptoms.



Note. ----- *ns,* — $p < .05$

Figure 2. Explicative model of academic achievement.

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PPM's indirect effects on GPA were statistically significant ($p < .05$) in the case of Sprightliness = .085, Integrity = -.027, Serenity = .029 and Moderation = -.029. Humanity had no significant indirect effect on achievement ($p > .05$). Well-being had a positive direct effect on AA. The presence of psychological symptoms had a negative direct effect on AA. And finally, AA had a positive direct effect on GPA.

Discussion

The main hypothesis of this research was that academic achievement is multi-determined and non-intellectual variables play an important role in explaining it. Also, this research emphasized the importance of differentiating achievement in terms of GPA and AA, as the later would possible be a good predictor of the former.

In the first approximation to study the associations among variables, GPA was only related to AA and well-being. Both results replicated background research that stated positive relations between AA and GPA (Brady-Amoon & Fuertes, 2011; Credé & Niehorster, 2012; Perera & DiGiacomo, 2015; Perera et al., 2015) and well-being and GPA (Ayyash-Abdo & Sánchez-Ruiz, 2012; Berger et al., 2011). Interestingly, none of the positive traits nor the psychological symptoms were related to GPA. These results contradict earlier findings but provide support to the hypothesis of the mediational role of AA. Regarding AA, all non-intellectual variables except Moderation were significantly related to AA. These findings replicated results from previous studies (e.g., Bailey & Phillips, 2015; Kerr et al., 2004) and gave further support to the hypothesis of AA's mediating role in explaining GPA. AA was positively related to GPA and significantly related to most of the other variables in the model. Multiple regression analysis on GPA confirms the lack of direct prediction of the variables of the model. In contrast, in the case of AA, the model was statistically significant and Sprightliness and psychological symptoms were significant predictors of AA.

Finally, the explicative model of GPA supported to the main hypothesis since all non-intellectual variables had statistically significant direct or indirect effects on GPA and in the expected direction. The model fit was adequate, and the explained variance of GPA was as expected. Regarding PPM's traits, Sprightliness resulted the most important characteristic in determining academic achievement. This result replicated PPM's findings in previous research (de la Iglesia & Castro Solano, 2018, 2019; de la Iglesia, Lupano & Castro Solano, 2019) where this trait also emerged as the most significant predictor of outcomes. Sprightliness may be compared to the VIA's character strengths of zest, perspective and perseverance (Lounsbury et al., 2009; Park & Peterson, 2008, 2009; Wagner & Ruch, 2015). Certainly, if an individual is characterized by sprightliness –focus on goals, has energy, enjoys pursing their objectives– and that person has academic goals, academic achievement will be more likely to be obtained.

Serenity, Moderation and Integrity showed significant but weaker effects on academic achievement. In the case of Serenity, it seems that it is relatively important to be able to master one's own and others' negative emotions. In the academic arena, negative emotions may easily arise consequence of exams, economic difficulties, interpersonal challenges, among many others. The ability to peacefully navigate through this stressful context functions as a clear tool. This positive trait may be compared to the VIA's self-regulation (Lounsbury et al., 2009; Park & Peterson, 2008, 2009; Wagner & Ruch, 2015).

Moderation and Integrity, however, had negative indirect effects on achievement. This is not an expected result given that Moderation is the positive version of Consciousness and this FFM's trait has major consistent evidence of positive prediction of academic achievement. In the multiple regression analysis Moderation was the only non-significant predictor of AA. A possible interpretation may rely on the fact that the presence of high Moderation may prevent students from acting, leaving them in the process of stating pros and cons of their possible

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actions. At college, students cannot control due dates of essays or exams and they must keep up with the required academic rhythm of performance. Academic achievement is not just performing well in exams but also performing well at the times demanded by the institution. In the case of Integrity, this replicates previous PPM's evidence where this positive trait negatively predicts positive outcomes such as mental health and job performance or satisfaction (de la Iglesia & Castro Solano, 2018, in press; de la Iglesia, Lupano, & Castro Solano, 2019). It is possible that Integrity is not associated with positive outcomes in the context of the Argentinean population where qualities grouped under Integrity -such as honesty and modesty- are not necessarily valued. Unfortunately, in this country, individuals that behave in honest and modest ways tend to be left behind in competitive contexts. It would be interesting to see if this is only a phenomenon of Argentina or it replicates in other cultures.

The structural model represents previous studies (Kamphorst Hofman et al., 2012; Perera & DiGiacomo, 2015; Perera et al., 2015; Petersen et al., 2009) replicating the mediational role of AA between background variables (traits and psychological health in this case) and objective achievement (GPA). The directions of the effects were also as expected since an increment in AA reflects on an increment in GPA, well-being's path towards AA was, and psychological symptom's path was negative. That is, it may be concluded that core characteristics as personality traits certainty have effects on academic achievement through their impact on mental health and academic adjustment. The predisposition to develop well-being or psychological symptoms given by the presence of positive traits impacts the perception of adjustment to college and this regulates objective achievement (GPA).

Conclusions and Implications

These results may be interpreted in light of broader academic goals such as student retention. Although this research did not measure retention directly, it can be hypothesized that the variables here studied may play an important role in preventing drop-out. An early assessment of positive personality traits in early circumstances such as those constituted by academic advising could provide the advisor with important information regarding the students' characteristics and, therefore, tailor and improve his/her interventions. This would probably enhance students' satisfaction and as a collateral benefit increase retention.

This research does not go without its limitations. To begin with, no real causation effect should be interpreted since the research design was cross-sectional. Also, sample was non-probabilistic and socio-economic status' categories were not proportionally represented. As in most research, many important variables were left out due to viability issues. Social desirability, intellectual abilities and many socio-demographic variables were not tested as control variables. Future research should focus on determining their role in models as the one here presented.

Also, for future lines of investigation, it would be of interest to test longitudinally the role of positive traits in explaining academic achievement. It seems clear that the core characteristics such as personality traits -positive in this case- play important roles in explaining different life outcomes -academic achievement in this case-. Students enter college with certain characteristics that predispose them to developing different psychological states and academic performance. Detecting them would enable educational actors to assist students in their passage through college possibly impacting in the population academic achievement and all positive consequences associated to it.

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