

Admission Criteria for MBA Programs: A Review

SAGE Open
 October-December 2016: 1–16
 © The Author(s) 2016
 DOI: 10.1177/2158244016669395
 sgo.sagepub.com


Silvana Dakduk^{1,2}, José Malavé¹, Carmen Cecilia Torres¹,
 Hugo Montesinos^{1,3}, and Laura Michelena¹

Abstract

This paper reports a review of studies on admission criteria for MBA programs. The method consisted in a literary review based on a systematic search in international databases (Emerald, ABI/INFORM Global, ProQuest Education Journals, ProQuest European Business, ProQuest Science Journal, ProQuest Research Library, ProQuest Psychology Journals, ProQuest Social Science Journals and Business Source Complete) of studies published from January 1990 to December 2013, which explore the academic performance of students or graduates of MBA programs. A quantitative review was performed. Results show that most researchers studied relations between GMAT (Graduate Management Admission Test) and UGPA (Undergraduate Grade Point Average) as predictors of GGPA (Graduate Grade Point Average). On the other hand, work experience and personal traits (such as personality, motivation, learning strategies, self-efficacy beliefs and achievement expectations) and their relation with GGPA had been less studied, and results are not consistent enough to consider them valid predictors of student performance at this time.

Keywords

management education, management, school sciences, MBA education, GMAT, UGPA, GGPA

Introduction

“The Master of Business Administration (MBA) has often been heralded as a ticket to the executive suite” (Kelan & Jones, 2010, p. 26). The MBA degree has become internationally recognized as an indicator of individual competitive advantage in management due to the distinctive abilities students develop during their education. Moreover, it has become one of the most popular and important professional degrees worldwide (Baruch & Leeming, 2001). Many authors have reported that MBA education has a positive impact on graduates’ future employment, income, and promotion prospects in both short and long term (Christensen, Nance, & White, 2012; Truell, Zhao, Alexander, & Hill, 2006).

By pursuing graduate studies, returning adults are often looking for an improvement in the job market positions, including both job-hunting and job-performing. Nowadays, employers look for “knowledge workers” who can perform complex, value-adding tasks, and continuously improve and acquire skills (Cao & Sakchutchawan, 2011). For business schools, the challenge is to ensure selecting the appropriate applicants, certify the quality of their education, and fulfill the promise of developing the required skills of their MBA students.

Only in United States in 2008, where MBA programs have the longest and most distinguished record, more than 250,000 students enrolled in MBA programs and more than 100,000 MBA degrees are awarded annually (Murray, 2011).

In emerging markets, such as those of China and Latin American countries, there is a remarkable growth not only of MBA programs and the number of students eager to enter them but also of initiatives that ensure such programs will fulfill the educational requirements for qualified managers to face the challenges of globalization.

A common interest and a growing concern of business schools and accreditation agencies (whose role has acquired increasing relevance) is to develop admission processes strong enough to avoid two kinds of errors: (a) admitting candidates without the required profile to complete the MBA program and (b) excluding those who are able to do it successfully both in time and performance (Bieker, 1996). To accomplish this, admission systems must perform two main tasks: (a) choosing the best variables to predict academic performance (AP) of applicants and (b) finding the best combination of those predictors for making admission decisions (Kuncel, Credé, & Thomas, 2007). Traditionally, admission systems of educational organizations have privileged previous academic

¹Instituto de Estudios Superiores de Administración, Caracas, Venezuela

²Colegio de Estudios Superiores de Administración, Bogotá, Colombia

³Florida State University, Tallahassee, USA

Corresponding Author:

Silvana Dakduk, Colegio de Estudios Superiores de Administración—CESA, Street 35 N° 5^a-38, Bogotá, Colombia.
 Email: silvana.dakduk@cesa.edu.co



Creative Commons CC-BY: This article is distributed under the terms of the Creative Commons Attribution 3.0 License (<http://www.creativecommons.org/licenses/by/3.0/>) which permits any use, reproduction and distribution of

the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

performance (PAP) and results in ability and knowledge tests, as predictors, and a combination of both for determining the entry profile of MBA students.

The goal of MBA program admission processes is to identify the necessary conditions in an applicant for successfully completing the program, and to predict whether a particular applicant possess them, subject to specific requirements of each institution (Kuncel et al., 2007). It should be added that both programs and students are subject to changes occurring in the global context, the labor market, and teaching strategies (Cao & Sakchutchawan, 2011; Carver & King, 1994), which continuously make the identification of those variables and their combinations that best predict the performance of MBA candidates a key issue for business schools, accreditation agencies, and scholars interested in education development.

The present study's purpose is to provide a systematic review of research on predictors of MBA students' AP, from 1990 to 2013, in order to identify the most frequently used variables, and their effectiveness; the study will contribute not only to scholarly discussion and research on this issue but also to the necessary continuous improvement of the work done by business schools in this delicate area.

Predictors of AP: Theory and Research

AP has been the object of intensive and extensive study, given the pressing needs of educational institutions, their administrators and faculty members, for evaluating their operations and procedures, improving the quality of education, enriching the graduate profile, and, in general, increasing the effectiveness and efficiency of educational systems (Musayon, 2001).

There is a wide range of AP definitions. According to De La Orden, Máfokozí, and González (2001), AP should be viewed as the result of educational activity in terms of achievements of both the educational system and the individuals. For the latter, AP represents the return of the efforts devoted to improving their personal competency. Other scholars refer to AP as a feature of educational systems in quantitative terms. For example, Artunduaga (2008) defined it as an indicator of educational effectiveness and quality, and Pérez, Cupani, and Ayllón (2005) consider it as a quantitative appraisal of the learning process within a specific educational system.

Another approach to AP was proposed by Torres and Rodríguez (2006), who defined it as the level of knowledge demonstrated by a student in one area, compared with the average of his or her peers, as a way of weighing the knowledge acquired in this area. This definition is similar to the one used by Girón and González (2005), who define AP as the level of learning reached by a student: a synthetic product of a series of factors impinging on, and from, the learning person. In sum, AP can be viewed both as a result of the learning process and as an indicator of achievement along this process.

AP has been expressed in different terms, such as capability, output, achievement, and efficiency. However, for Edel (2003), such differences are semantic in nature, and those different terms can be used as interchangeable synonyms describing the learning process and its results. According to Garbanzo (2007), what is important is to consider the multiplicity of factors and space-time settings intervening in the learning process.

Artunduaga (2008) grouped the factors most used to predict AP in two categories: individual and situational. Individual factors include demographic variables (such as age, gender, marital status, work experience, among others), cognitive variables (intelligence and aptitude, PAP, abilities and basic skills, learning and cognitive styles, and motivation), and attitudinal variables (learning responsibility, self-regulation, satisfaction and interest in studies, initiative toward studies, goals, self-concept, social skills). Situational factors include sociocultural variables (sociocultural origin, family educational level, social environment, and the like), instructional variables (related to the teacher and the classroom environment), and institutional variables (related to the educational institution characteristics and policies). Similarly, Garbanzo (2007) classified AP determinants in three categories—individual, social, and institutional—with subcategories or indicators.

Referring specifically to MBA programs, and drawing from different sources, Koys (2010) stated that admission processes should be designed according to the combination of abilities required for the successful completion of an MBA, such as cognitive abilities, quantitative skills, previous academic success, labor success or performance, and personality traits. These variables are also the most widely used in the literature, as AP predictors in MBA courses, and will be described in detail below.

Cognitive Ability

It has been demonstrated, in both graduate and undergraduate studies in different fields, that cognitive abilities are valid predictors of AP in a wide range of educational systems (Koys, 2010). There are different ways of conceiving cognitive ability. More recent notions share the idea that it results from a combination of the knowledge acquired by students and their ability for successfully using it, in adapting to their environments (Koys, 2010). Generally, cognitive ability has been defined as a multidimensional construct, integrated by different abilities such as numerical, verbal, abstract, mechanical, logical, and eye-hand coordination, among others. The consideration of such abilities may vary according to the program, the test, and even the institutional policies of the particular educational system (Koys, 2010).

There is certain consensus in the research literature, in spite of the variety of conceptual and operational definitions, in that the best way of measuring cognitive ability is through standardized tests, which allow knowing an individual's

performance by comparison with the test itself in different moments and to a reference group, as well as comparing different populations. Recent studies on admission processes to MBA programs use, mainly, standardized tests for measuring cognitive abilities, among them the Graduate Management Admission Test (GMAT), the most widely used by universities and business schools around the world as admission requirement for their programs (Gropper, 2007; Koys, 2010; Kuncel et al., 2007).

More than 6,000 programs offered by more than 2,100 institutions in 114 countries use the GMAT as a selection criterion for their programs, according to the Graduate Management Admission Council (GMAC; Talento-Miller & Rudner, 2005), and many schools in non-English-speaking countries use a validated version in their own language.

The GMAT measures essential skills in business and management, such as analytical writing and problem-solving abilities, and addresses data sufficiency, logic and critical reasoning. The test consists of three sections: quantitative, verbal, and analytical writing (Kass, Grandzol, & Bommer, 2012); however, most studies examine only the verbal and quantitative sections as evidenced in other meta-analyses (Kuncel et al., 2007; Oh, Schmidt, Shaffer, & Le, 2008).

Although no specific procedure for admission is formally required, accreditation agencies coincide in recommending the use of standardized tests for student selection, which has contributed to the increasing use of the GMAT as an entry evaluation tool (Gropper, 2007). As stated by the GMAC, in its validity survey (GMAC, n.d.), the GMAT is a highly reliable predictor of student performance ($r = .92$) as well as a powerful tool available to graduate management admissions professionals for measuring the skills students need to succeed. Its predictive validity, considering mid-program graduate management school grades, is also high ($r = .46$; Talento-Miller & Rudner, 2005).

Kuncel et al. (2007) found, in a recent meta-analysis, a GMAT predictive validity for the graduate grade point average (GGPA) higher than that reported by GMAC ($r = .47$). However, according to Bisschoff (2012), “the major controversy seems to be not the validity of GMAT, but rather the significance of the positive correlation between performance in the test and business success” (p. 192).

PAP

In several past studies, previous performance predicts future performance (García, Alvarado, & Jiménez, 2000; Goberna, López, & Pastor, 1987; House, Hurst, & Keely, 1996; Koys, 2010). However, Garbanzo (2007) makes clear that the predictive power of PAP depends on the educational quality of the institution of origin and, consequently, its inclusion in admission procedures must be viewed cautiously.

There are different ways of measuring PAP. The most commonly used is the average of grades a student obtains in the last academic achievement (in the MBA case,

undergraduate courses best known as Undergraduate Grade Point Average [UGPA]). Some institutions express these averages in terms of standardized scales (usually a 0-4 scale) to make them comparable. Other ways of measuring PAP are class ranks and efficiency indexes, related to the time used for approving required credits. According to Garbanzo (2007), AP can also be measured in terms of quantitative grades, passed and failed courses, dropout rates, or degree of academic success.

The ideal situation would be the use of standardized tests that allow valid comparisons among subject matters for the same student, various students on the same subject matter, and various students on different subject matters. However, given the difficulty of standardizing all evaluations, what is commonly used is an average of the students' grades as a global measure of AP (Musayon, 2001), which certifies their achievements and provides a precise and accessible indicator (Garbanzo, 2007).

According to Ahmadi, Raiszadeh, and Helms (1997), in the specific case of MBA students, UGPA is a powerful predictor of AP. This is why it has become the most common way of operationally defining this variable in business and management programs. The GMAC (n.d.) survey shows a UGPA predictive validity lesser than that of GMAT, though still acceptable ($r = .28$). In their meta-analysis, Kuncel et al. (2007) found a higher predictive validity of UGPA ($r = .35$), and Christensen et al. (2012) reported an even higher figure ($r = .47$).

Work Experience

For many institutions, work experience is an important prerequisite for admission to MBA programs, although some schools require it only for Executive or Global MBA programs. Some accreditation agencies, such as the Association of MBAs (AMBA; 2013), establish a minimum 3 years of relevant managerial experience for admission to MBA programs. However, there is no empirical evidence that such a variable predicts AP in these programs, and some in Executive MBAs (Koys, 2010).

Some of the inconsistencies of this variable predictive ability might be analogous to those of PAP (due to the diverse educational qualities of institutions), in the sense that not all work experiences are equal, or socialize individuals in the same way. For this reason, some authors adopt a cautious approach toward its inclusion and measurement, and recommend accompanying considerations, such as position achieved, number of subordinates, letters of recommendation from bosses and coworkers, main achievements, and job functions related to the program.

Gropper (2007) questioned the use of work experience as an admission criterion for MBA programs, but not for Executive MBAs: “A survey in 2005 from the EMBA Council showed that most schools required a minimum of from 5–8 years of full-time professional work experience,

with at least 4 years in a supervisory or managerial role” (p. 208). DeRue (2009) questioned the way of measuring labor experience, from the perspective of MBA recruiting, limited to the number of years, and proposed to distinguish two dimensions: quantity and quality. Quantity refers to the total number of years of work experience or time within a particular job or organization. Quality refers to the different types of experiences one person can live during this time. However, no relation was found between AP and quantitative ($r = .07$) or qualitative ($r = .08$) work experience.

Psychological Variables

A variety of psychological variables has been used to account for AP, such as personality, motivation, learning strategies, self-efficacy beliefs, achievement expectations, among others (Pérez et al., 2005). According to Chamorro-Premuzic and Furnham (2003), intelligence refers to individual capabilities, whereas personality refers to what the individual will really do with such capabilities; thus, personality traits should also be predictors of AP. However, for Pérez et al. (2005), there is no direct relation between AP and personality; rather, personality traits are related to other variables with strong influence on academic success, such as motivation, intelligence, and self-efficacy. Personality would not be directly related to AP, but to a successful adaptation to the educational environment.

The five personality factors (Big Five) have played an important role in studies of academic success in MBA programs. It is considered the test of widest scope and best psychometric performance for predicting personality traits, outside the clinical realm, including educational contexts (M'Hamed, Chen, & Yao, 2011). These factors—conscientiousness, openness to experience, extraversion, agreeableness, and neuroticism—are basic tendencies that constitute endogenous psychological foundations of “characteristic adaptations,” like self-concept, personal striving, habits, or attitudes. Koys (2010) reported that conscientiousness and openness to experience predict high performance in MBA programs, whereas M'Hamed et al. (2011) found relations between the same factors and the creative performance of MBA students.

Some researchers stress the need of using qualitative measures of such variables as personality in admission processes, for obtaining a more comprehensive appraisal of candidates and enriching the analysis of the process (Ahmadi et al., 1997; Braunstein, 2006). However, the evidence is not conclusive as to their effect and form of inclusion.

Method

The present work consists in a systematic review of the literature on admission criteria in MBA programs to provide as complete a list, as possible, of all the published studies relating the study of academic assessment in this type of program. Research review is a special case of literature review, which tries to encompass research on a given subject and draw inferences

from a series of studies guided by similar hypotheses (Sánchez & Ato, 1989; Sánchez-Meca, 2003). In contrast, with traditional reviews that attempt to summarize results of a number of studies, based on explicit and rigorous criteria to evaluate and synthesize all the literature on a particular topic (Cronin, Ryan, & Coughlan, 2008; Ramdhani, Rahmdhani, & Amin, 2014), the primary purpose of this review is to provide a comprehensive background to understand current knowledge and call attention to the significance of new research in the admission process and the AP in the MBA program.

The present study followed the general procedure recommended by Parahoo (2006) in developing a systematic literature review to guarantee the reliability and validity. The processes are summarized as follows:

1. Define inclusion or exclusion criteria: The literature review covers the period 1990-2013; since the 1990s, technology development and its impact on global industry led to a reevaluation of the relevance of MBA programs. The following terms, in both English and Spanish, were used as keywords: academic performance, efficiency, achievement, success, in combination with MBA, predictor, GMAT, UGPA, and work experience. In every detected article, a full-text review of bibliographic references allowed for the inclusion of all relevant studies.
2. Access and select the literature: The search included the following databases: Emerald, ABI/INFORM Global, ProQuest Education Journals, ProQuest European Business, ProQuest Science Journal, ProQuest Research Library (XML; ProQuest), ProQuest Psychology Journals (CSA; ProQuest XML), ProQuest Social Science Journals (ProQuest XML), and Business Source Complete (EBSCO). Based on this search, 179 articles fulfill the criteria.
3. Assess the quality of the literature included in the review: The following criteria were established to define the work to be included in the review and were as follows: (a) study type: empirical; (b) sample: students or graduates of MBA programs (any type); and (c) dependent variable: academic performance or equivalent. After applying these criteria, the sample decreased to 49 articles that satisfied the conditions.
4. Analyze, synthesize, and disseminate the findings: A matrix was created to organize the selected articles, based on the most important characteristics of the key studies to provide an analytic framework. According to Sally (2013), the matrices were created in the first column along the vertical axis of the table, and listed the author for each study selected. The columns present these works chronologically, specifying author, date of publication, journal, MBA program type, country, sample size (N), subject profile, independent variables, and effect sizes for the variables in the studies considered. Table 1 summarizes this matrix.

Table 1. Sample Description.

Code article	Authors	Date	Journal	Country	N	Profile	Independent variables	Effect size
1	Stolzenberg and Relles	1991	<i>Social Science Research</i>	USA	1,924	Graduates	GMAT, country origin, English proficiency	GMATQ0.7895 GMATV0.8489
2	Wooten and McCullough	1991	<i>Business Forum</i>		116	Deans	GMAT, UGPA, work experience	
3	Zwick	1993	<i>Journal of Educational Statistics</i>	USA, Canada	3,392	Graduates	GMAT, UGPA	GMAT 0.020 UGPA 0.003
4	Rothstein, Paunonen, Rush, and King	1994	<i>Journal of Educational Psychology</i>	Canada	450	Students	GMAT, personality	GMAT 0.310
5	Wright and Palmer	1994	<i>Journal of Education for Business</i>	USA	86	Graduates	GMAT, UGPA	GMAT 0.2391 UGPA 0.2725
6	Carver and King	1994	<i>Journal of Education for Business</i>		467	Students	GMAT, UGPA, age, work experience	GMAT 0.566 UGPA 0.757
7	Arnold, Chakravarty, and Balakrishnan	1996	<i>Journal of Education for Business</i>	USA	109	Graduates	GMAT, UGPA, undergraduate characteristics, recommendation letters, work experience, current job	GMAT 0.342 UGPA 0.158
8	Bieker	1996	<i>Journal of Education for Business</i>	USA	71	Graduates	GMAT, UGPA, gender, age, ethnicity	GMAT 0.004 UGPA 0.083
9	Ahmadi, Raiszadeh, and Helms	1997	<i>Education</i>	USA	279	Graduates	GMAT, UGPA, undergraduate characteristics, gender, age, ethnicity	GMAT 0.433 UGPA 0.521
10	Peiperl and Trevelyan	1997	<i>The Journal of Management Development</i>	UK	362	Graduates	GMAT, gender, age, marital status, English proficiency, work experience	GMAT 0.0351
11	Wright and Palmer	1997	<i>College Student Journal</i>	USA	201	Students	GMAT	
12	Wright and Palmer	1999	<i>Educational Research Quarterly</i>	USA	198	Students	GMAT, UGPA, age, gender	GMAT 0.020 UGPA 0.186
13	Dobson, Krapljan-Barr, and Vielba	1999	<i>International Journal of Selection and Assessment</i>	UK	834	Students	GMAT, age, gender, work, experience, native language	
14	Hancock	1999	<i>Journal of Education for Business</i>	USA	269	Graduates	Gender	
15	Adams and Hancock	2000	<i>College Student Journal</i>	USA	269	Graduates	Gender, work experience	
16	Arbaugh	2000	<i>Management Learning Research</i>	USA	27	Students	Gender	
17	Dreher and Ryan	2000	<i>Research in Higher Education</i>	USA	230	Students	GMAT, UGPA, undergraduate characteristics, gender, ethnicity, work experience	GMAT 0.260 UGPA 0.260
18	Ekpenyong	2000	<i>Journal of Financial Management & Analysis</i>	Nigeria	382	Graduates	UGPA, gender, age, work experience, current job	
19	Hoefler and Gould	2000	<i>Journal of Education for Business</i>	USA	700	Graduates	GMAT, UGPA, undergraduate characteristics, program type, gender, age, English proficiency, work experience	GMAT 0.354 UGPA 0.250

(continued)

Table 1. (continued)

Code article	Authors	Date	Journal	Country	N	Profile	Independent variables	Effect size
20	Yang and Lu	2001	<i>Journal of Education for Business</i>	USA	395	Graduates	GMAT, UGPA, gender, age	GMAT 0.011 UGPA 0.267
21	Braunstein	2002	<i>College Student Journal</i>	USA	280	Graduates	GMAT, UGPA, undergraduate characteristics, gender, work experience, English proficiency	GMAT 0.336 UGPA 0.311
22	Wright and Bachrach	2003	<i>Journal of Education for Business</i>	USA	334	Students	GMAT, gender	GMAT 0.822
23	Clayton and Cate	2004	<i>International Advances in Economic Research</i>	USA	189	Students	GMAT, undergraduate characteristics, undergraduate type, gender, age, ethnicity, work experience	
24	Bisschoff	2005	<i>Journal of Economic and Management Sciences</i>	South Africa	729	Students	UGPA, undergraduate characteristics, work experience	
25	Koys	2005	<i>Journal of Education for Business</i>	Bahrain, Czech Republic, China	75	Graduates	GMAT, UGPA	GMAT 0.609 UGPA 0.113
26	Mangum, Baugher, Winch, and Varanelli	2005	<i>Journal of Education for Business</i>	USA	403	Students	UGPA, satisfaction and achievement perception	
27	Braunstein	2006	<i>College Student Journal</i>	USA	292	Graduates	GMAT, UGPA, undergraduate characteristics, gender, work experience	
28	Hedlund, Wilt, Nebel, Ashford, and Sternberg	2006	<i>Learning and Individual Differences</i>	USA	792	Graduates	GMAT, UGPA, skills, work experience	GMAT 0.400 UGPA 0.320
29	Latham and Brown	2006	<i>Applied Psychology: an international review</i>	Canada	125	Students	Self-efficacy, satisfaction	
30	Sireci and Talento-Miller	2006	<i>Educational and Psychological Measurement</i>	USA	5,076	Students	GMAT, UGPA, gender, ethnicity	GMAT 0.285 UGPA 0.234
31	Sulaiman and Mohezar	2006	<i>Journal of Education for Business</i>	Malaysia	489	Students	UGPA, undergraduate characteristics, gender, age, ethnicity, work experience	UGPA 0.180
32	Truell, Zhao, Alexander, and Hill	2006	<i>The Delta Pi Epsilon Journal</i>	USA	179	Graduates	GMAT, UGPA, undergraduate characteristics, program type, gender, age, work experience	GMAT 0.036 UGPA 0.309
33	Whittingham	2006	<i>Decision Sciences Journal of Innovative Education</i>	USA	112	Students	GMAT, UGPA, gender, personality	
34	Fish and Wilson	2007	<i>College Student Journal</i>	USA	143	Graduates	GMAT, UGPA, undergraduate characteristics, ethnicity, work experience	GMAT 0.004 UGPA 0.271
35	Gropper	2007	<i>Academy of Management Learning & Education</i>	USA	180	Students	GMAT, UGPA, undergraduate characteristics, work experience, current job	GMAT 0.085 UGPA 0.047

(continued)

Table 1. (continued)

Code article	Authors	Date	Journal	Country	N	Profile	Independent variables	Effect size
36	Kuncel, Credé, and Thomas	2007	<i>Academy of Management Learning & Education</i>			Meta-analysis	GMAT, UGPA	
37	Loucopoulos, Gutierrez, and Hofler	2007	<i>Academy of Information and Management Sciences Journal</i>	USA	85	Students	GMAT, UGPA	
38	Oh, Schmidt, Shaffer, and Le	2008	<i>Academy of Management Learning & Education</i>			Meta-analysis	GMAT	
39	DeRue	2009	<i>GMAC Research Reports</i>	USA	280	Graduates	GMAT, gender, nationality, undergraduate characteristics, personality Big Five, work experience	GMAT 0.500
40	Fish and Wilson	2009	<i>College Student Journal</i>	USA	364	Graduates	GMAT, UGPA, undergraduate characteristics, program type, age, ethnicity	GMAT 0.007 UGPA 0.254
41	Deis and Kheirandish	2010	<i>Academy of Educational Leadership Journal</i>	USA	61	Students	GMAT, UGPA, gender, age, ethnicity, work experience	GMAT 0.008 UGPA 0.228
42	Fairfield-Sonn, Kolluri, Singamsetti, and Wahab	2010	<i>American Journal of Business Education</i>	USA	833	Graduates	GMAT, UGPA, exempted credits, gender, work experience	UGPA 0.169
43	Koys	2010	<i>Journal of Education for Business</i>	Central Europe and Middle East	67	Graduates	GMAT, UGPA, skills, English proficiency, work experience	GMAT 0.450 UGPA 0.260
44	Cao and Sakchutchawan	2011	<i>The Journal of Human Resource and Adult Learning</i>	USA	2,533	Students	Program type, undergraduate characteristics, gender, marital status	
45	Kumar	2011	<i>The IUP Journal of Management Research</i>	India	105	Graduates	Skills	
46	M'Hamed, Chen, and Yao	2011	<i>Journal of Technology Management in China</i>	China	208	Students	Personality, learning strategies	
47	Bisschoff	2012	<i>Managing Global Transitions</i>	USA	360	Graduates	UGPA, undergraduate characteristics, work experience, gender, age, ethnicity.	
48	Christensen, Nance, and White	2012	<i>Journal of Education for Business</i>	USA	491	Graduates	UGPA, undergraduate characteristics	UGPA 0.466
49	Kass, Grandzol, and Bommer	2012	<i>Journal of Education for Business</i>	USA	72	Graduates	GMAT, UGPA	GMAT 0.114

Note. GMAT = Graduate Management Admission Test; GMATQ = Graduate Management Admission Test Quantitative; GMATV = Graduate Management Admission Test Verbal; UGPA = Undergraduate Grade Point Average; GMAC = Graduate Management Admission Council.

Considering the Artunduaga (2008) and Garbanzo (2007) categories, AP predictors used in these studies can be grouped in four categories: academic, psychological, work-related, and demographic variables. The most frequently used academic variable was the GMAT, mostly combined with other variables, mainly UGPA. Other academic variables used were characteristics and type of undergraduate studies, number of exempted credits, and mathematical, cognitive, and verbal skills. Only six studies did not use academic variables. Psychological variables were the least used: Only four studies used personality traits, one used learning strategies combined with personality, one used motivation, one used aptitudes, and one used satisfaction combined with achievement perception.

Work experience previous to the MBA program was used in 21 studies; in two cases, combined with current job, and in one case with recommendation letters. The most frequently used demographic variables were gender and age, followed by ethnicity, English proficiency, and marital status. Twenty studies did not use demographic variables.

Dependent variable—performance in the MBA program—was measured in different ways. The most commonly used was GGPA (33 studies). Other ways of measuring performance or achievement were completing (or not) the program and obtaining a high or low average; in this study, it is called academic success (AS). One study used the result of a final exam. Several studies used more than one performance indicators: Five used GGPA combined with AS; one used GGPA and class participation; one used GGPA, satisfaction with the program, and self-efficacy perception; one used class participation and perceived program difficulty; and one used AS and satisfaction with the program.

Results

The systematic literature review showed that the most studied relations were those of GMAT and UGPA as predictors of GGPA: 28 out of 32 studies found significant relations with GMAT and 23 out of 29 found significant relations with UGPA. Both higher GMAT scores and higher UGPA measures were associated with higher GGPA measures. GGPA was positively related to skills (mathematical, cognitive, and verbal) in three studies. Other studies searched for relations between GGPA and such variables as the number of exempted credits, academic index, and type of MBA program, but none of these relations were found to be significant.

AS was found related to GMAT in five out of six studies, where higher GMAT scores were associated to success. Similarly, six studies found significant positive relations between AS and UGPA. Only two studies searched for relations between AS and type of MBA program: One of them did not find a significant relation, and the other found an association between studying a part-time MBA and academic success.

The least studied relations were class participation and GMAT, results of a final exam and GMAT, and satisfaction

with the program and program type. One study found associations between higher GMAT scores and class participation and higher grades in a final exam, as well as more satisfaction with a traditional MBA than with an online MBA (Table 2).

Some studies searched for relations between characteristics of undergraduate studies and AP, but there was no consensus regarding the influence: Five in 11 studies found that an undergraduate degree in business or engineering was positively related to GGPA, whereas one study found that a business major was negatively related to GGPA. Two studies relating undergraduate degree to AS found that students who had business degrees usually pursued graduated studies, but lasted 1 year more than expected. Three studies out of seven found significant relations between GGPA and studying in top universities; however, only one found a significant relation between studying in a top university an AS. Two out of three studies found that entering the MBA with a master degree was associated with dropping out of the MBA, and one study did not find a relation between the achieved title and GGPA. One study did not find an association between having a part-time or full-time undergraduate degree and AS. Finally, the only research comparing the performance of students whose undergraduate schools were Association to Advance Collegiate Schools of Business (AACSB)-accredited or not did not find significant differences (Table 3).

Regarding relations between AP and demographic variables, the most studied relation was that of GGPA and gender. Only two out of 20 studies found significant relations: One found that women showed better performance than men; this was the case only when they had an undergraduate degree in business, but if the students had a nonbusiness undergraduate degree, there was no difference in performance between men and women; finally, one study found that men showed better performance than women.

The second most studied relation was that of GGPA and age. Only four out of 11 studies found significant relations, though with contrary directions: Three found that older students performed better and two that younger students performed better. English proficiency was found significantly related to GGPA in four of the five studies on this relation: People with higher TOEFL levels or native English speakers were found to have a higher AP. Only one study related GGPA to marital status, and found that married students had better grades than their unmarried counterparts.

Ten studies searched for relations between GGPA and ethnicity or nationality. Only four found significant relations: Two found that being Canadian in Canada was related to high performance, one that coming from a country with overall low performance at the TOEFL was associated with low AP, and one study did not find differences between domestic and foreign students. Only one study found that being Caucasian was associated with high performance, contrary to other four studies that did not find a relationship between race and performance.

Table 2. Academic Variables: Numbers of Studied and Significant Relations.

Studied relations	Frequency of studied relations	Code articles	Frequency of significant relations	Code articles
GGPA—GMAT	32	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 17, 19 20, 21, 22, 25, 27 28, 30, 32, 33, 34 35, 36, 38, 39, 40 41, 42, 43, 49	28	1, 4, 5, 6, 7, 8, 9, 10, 12, 17, 19, 20, 21, 22, 25, 27, 28, 30, 32, 33, 34, 36, 38, 39, 40, 42, 43, 49
GGPA—UGPA	29	2, 3, 5, 6, 7, 8, 9, 12, 17, 18, 19, 20, 21, 25, 27, 28, 30, 31, 32, 33, 34, 35, 36, 40, 41, 42, 43, 48, 49	23	3, 5, 6, 7, 9, 12, 17, 19, 20, 21, 27, 28, 30, 31, 32, 33, 34, 36, 40, 42, 43, 48, 49
Academic success—GMAT	6	7, 11, 12, 23, 36, 38	5	7, 11, 12, 36, 38
Academic success—UGPA	6	6, 12, 24, 26, 42, 47	6	6, 12, 24, 26, 42, 47
GGPA—abilities	3	28, 43, 45	3	28, 43, 45
Academic success—Program type	2	23, 44	1	23
Class participation—GMAT	1	4	1	4
Satisfaction—Program type	1	44	1	44
Final exam—GMAT	1	13	1	13
GGPA—Exempted credits	1	42	0	—
GGPA—Academic index	1	19	0	—
GGPA—Program type	1	32	0	—
Total	84		69	

Note. GGPA = graduate grade point average; GMAT = Graduate Management Admission Test; UGPA = Undergraduate Grade Point Average.

Table 3. Undergraduate Studies Characteristics: Numbers of Studied Relations and Accepted/Rejected Hypotheses.

Studied relations	Frequency of studied relations	Code articles	Frequency of accepted hypotheses	Code articles
GGPA—Undergraduate degree	11	9, 17, 21, 27, 31, 32, 34, 35, 39, 40, 48	5	17, 31, 35, 39, 48
GGPA—Undergraduate institution	6	17, 19, 21, 27, 34, 40	2	17, 19
Academic success—Highest degree	3	6, 24, 47	0	—
Academic success—Undergraduate institution	2	23, 24	1	24
Academic success—Undergraduate degree	2	24, 47	2	24, 47
GGPA—Highest degree	1	6	0	—
Academic success—Previous study type	1	44	1	—
GGPA—AACSB accredited institution	1	48	0	—
Total	27		11	

Note. GGPA = graduate grade point average; AACSB = Association to Advance Collegiate Schools of Business.

Regarding other ways of measuring AP, one out of three studies found that being a woman was associated to AS in an MBA program. Only one study searched for relations between success and marital status, finding that married students have higher AS. One study found significant relations between ethnicity and AS: Caucasian and Hispanic students were more likely to graduate than Asian students in a U.S.

college. One study did not find association between the grade in a final exam and gender, but it did find associations with class participation and perceived difficulty of the program: Women participated more in class, and men perceived the program tougher in an online MBA. Another study found that higher English proficiency related to grades in a final exam (Table 4).

Table 4. Demographic Variables: Numbers of Studied and Significant Relations.

Studied relations	Frequency of studied relations	Code articles	Frequency of significant relations	Code articles
GGPA—Gender	20	8, 9, 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 27, 31, 32, 33, 39, 41, 42	2	12, 42
GGPA—Age	11	8, 9, 10, 12, 18, 19, 20, 31, 32, 40, 41	4	9, 10, 18, 19
GGPA—Ethnicity/nationality	10	1, 8, 9, 17, 20, 31, 34, 39, 40, 41	4	1, 34, 40, 41
GGPA—English proficiency	5	1, 10, 19, 20, 43	4	1, 10, 20, 43
Academic success—Gender	3	23, 42, 44	1	42
Academic success—Age	3	12, 23, 44	1	12
Academic success—Marital status	1	44	1	44
GGPA—Marital status	1	10	1	10
Academic success—Ethnicity/nationality	1	23	1	23
Final exam—English proficiency	1	13	1	13
Course difficulty—Gender	1	16	1	16
Class participation—Gender	1	16	1	16
Final exam—Gender	1	16	0	—
Total	59		22	

Note. GGPA = graduate grade point average.

The effect of work-related variables on AP was less than conclusive. The most studied relation was that of GGPA and work experience: Only eight in 17 studies found significant differences, three studies found that more years of experience were associated with higher GGPA, two found that starting the MBA with less than 2 years of work experience were negatively related to AP, one that having five or more years of work experience was associated with higher GGPA, one that the total years of work experience was not significant but that reaching a level from Division Manager through Vice President was positively correlated with GGPA (whereas being a President/CEO was negatively correlated), and the last one found that having work experience was positively related to AP only if the student did not have an undergraduate business degree. In addition, a survey among several deans of MBA institutions found that work experience was given a medium degree of importance, following UGPA and GMAT.

No significant relations were found between GGPA and recommendation letters and characteristics of the student's current job. Relations were found between years of work experience and academic success: Two out of five studies found that work experience discriminated whether the student would complete the MBA in 1 year more than expected or drop out of the program. Similar to GGPA, no relations were found between success and recommendation letters and characteristics of the student's current job (Table 5).

Psychological variables were the least studied; however, some significant relations were found between them and AP. GGPA was found related to personality in three out of five

studies. One study measured personality with the Form E of Jackson's (1984) Personality Research Form (PRF) that measures 20 personality traits, and found that high orientation to achievement, high dominance, high exhibition, and low abasement were related to high GGPA. This study also measured personality traits using the Big Five test and found that low agreeableness and high openness to experience was related to high GGPA. Another study, which measured personality with the RightPath6 (six scales), found that for qualitative courses, detachment predicted high GGPA, so did introversion and reflection for men and unstructured for women; for quantitative courses, detachment predicted high GGPA for men and unstructured and reactivity for women. Another study, using the Big Five, found that conscientiousness and openness to experience were associated with high AP, and neuroticism and agreeableness were associated with low AP. In addition, two studies did not find significant relations using the Big Five.

Two studies found an association between high motivation and high GGPA. One measured motivation through interviews as a subjective evaluation of students at the beginning of the MBA. The other study found that motivation to learning and both proximal and distal goals were more related to high AP than motivation to just distal goals. One research related GGPA to learning strategies and found significant relations: A deep strategy approach was related to high GGPA.

Motivation and satisfaction with the program were not found related to AS, in the only study testing such a hypothesis. However, another study found a significant positive

Table 5. Work-Related Variables: Numbers of Studied and Significant Relations.

Studied relations	Frequency of studied relations	Code articles	Frequency of significant relations	Code articles
GGPA—Work experience	17	6, 7, 10, 15, 17, 18, 21, 27, 28, 31, 32, 34, 35, 39, 41, 42, 43	8	6, 7, 17, 21, 27, 32, 35, 41
Academic success—Work experience	5	7, 23, 24, 42, 47	2	24, 47
GGPA—Current job	2	7, 18	0	—
Academic success—Current job	1	7	0	—
Academic success—Recommendation letters	1	7	0	—
GGPA—Recommendation letters	1	7	0	—
Total	27		10	

Note. GGPA = graduate grade point average.

Table 6. Psychological Variables: Numbers of Studied and Significant Relations.

Studied relations	Frequency of studied relations	Code articles	Frequency of significant relations	Code articles
GGPA—Personality	5	4, 33, 39, 43, 46	3	4, 33, 46
GGPA—Motivation	2	7, 29	2	7, 29
GGPA—Learning strategy	1	46	1	46
Class participation—Personality	1	4	1	4
Academic success—Achievement perception	1	26	1	26
Satisfaction—Motivation	1	29	1	29
Academic success—Motivation	1	26	0	—
Self-efficacy—Motivation	1	29	0	—
Total	13		9	

Note. GGPA = graduate grade point average.

relation between motivation to learning and satisfaction with the program. One study found an association between achievement perception and academic success: Perception of financial difficulties was related to MBA dropout, but achievement perception in long or short term was related to success. The only study relating perceived self-efficacy and motivation did not yield significant results. Finally, a relation was found between personality and class participation: High extraversion, high openness to experience, and low agreeableness were related to high participation (Table 6).

Discussion

Literature review results show that, in spite of the wide range of variables that can be used for student selection, academic variables are the most widely used in studies predicting AP. Particularly, GMAT scores and UGPA measures were the most studied, with GGPA as dependent variable, in the last 23 years of research in this field.

This finding reveals the pervasive trend of using a restricted range of quantitative and standardized measures of AP, notwithstanding the frequent recommendations to use other variables (such as psychological attributes, labor indicators, or

demographic factors) that might enrich analysis and predictions. This could be explained in terms of the strength of the GMAT and UGPA, which offer comparative measures of performance (of students and their reference groups) according to common criteria.

One distinctive feature of MBA programs is the profile heterogeneity of their participants, given the variety of competences required for succeeding in management, instead of the characteristic specialization of other traditional fields. An MBA course congregates graduates from different areas, such as engineers, physicians, lawyers, social scientists, and any other professionals looking for developing managerial competences, not only business graduates. Thus, the need for simplifying and ensuring comparability of measures used in the selection processes of universities and independent business schools.

A methodological reason for the pervasive use of GMAT and UGPA is the availability of valid, reliable, and widely shared operational definitions that facilitate their inclusion in the student evaluation and selection processes of educational institutions. In fact, their very common use by universities and business schools makes them more accessible than other measures. Moreover, although no single rule specifies how

students should be selected for MBA programs, common educational regulations and international accreditation agencies strongly recommend the use of objective and standardized measures for candidate evaluation and selection.

UGPA was found the second most-used independent variable for predicting AP. However, this variable is intrinsically related to the functioning of American educational systems and those based on them, which excludes foreign from researches students and systems, thus reducing the scope of any literature review on this subject.

Our findings are consistent with those of meta-analysis reported by Kuncel et al. (2007) and Oh et al. (2008). Both studies found a positive and significant relation between GGPA and GMAT and UGPA as predictors. The relation reported in the present study is lower than theirs. Similarly, the GMAC surveys reported a positive and significant relation between these variables, which is higher than the relation found in the present research. A possible explanation for these differences might be found in the different research purposes and sample sizes. Kuncel et al.'s and Oh et al.'s studies comprise wider time periods, and the GMAC used a big sample from those institutions using GMAT, with the purpose of updating and standardizing the test norms.

Available data confirm the role of GMAT and UGPA as predictors of AP and success in MBA programs and the use of these measures as reliable and valid admission criteria in universities and business schools. These results are consistent with those of similar studies using measures related to GMAT as independent variables, such as cognitive, verbal, and mathematical abilities, which contributes to the convergent validity of the cognitive ability construct as an effective predictor of student performance as the present study assumes that GMAT represents a standardized measure of cognitive ability.

Regarding other academic variables, such as undergraduate studies, the literature suggests that individuals educated in business-related areas perform better in MBA programs. However, although some reviewed studies confirmed this relation (Bisschoff, 2005, 2012; Braunstein, 2006; Christensen et al., 2012; DeRue, 2009; Gropper, 2007; Sulaiman & Mohezar, 2006), a larger number of studies did not find relations between these variables (Ahmadi et al., 1997; Dreher & Ryan, 2000; Fish & Wilson, 2007, 2009; Truell et al., 2006), and even one of them rejected such a hypothesis (Braunstein, 2002), which leads to question the use of the variable undergraduate studies as predictor of academic success in MBA programs. Perhaps the variable predictive inconsistency derives from the heterogeneity of criteria used for including it in different studies, as well as the intrinsic differences among programs implemented by each educational institution. Thus, it seems more reasonable to use specific competencies as predictors, instead of programs pursued by students.

Similar results were found in analyzing the effect of undergraduate educational institutions. Although some

studies reported a positive and significant relation between studying in a top university and AP in the MBA (Bisschoff, 2005, 2012; Dreher & Ryan, 2000; Hoefler & Gould, 2000), a bigger number of studies did not find relations between these variables (Braunstein, 2002, 2006; Clayton & Cate, 2004; Fish & Wilson, 2007, 2009). One research did not find a significant relation between GGPA and having studied in an AACSB-accredited institution. This leads to question the use of the educational institution as a selection criterion because results lack enough consistency for assuming that the previous university warrants future performance.

Previous graduate studies received little attention as an independent variable. However, available information indicates a relation between having a graduate degree and lesser performance in MBA programs, and even dropping out (Bisschoff, 2005). It should be noted that such a relation might be influenced by a series of moderating variables, such as age of entry at the MBA and life cycle moment of the already graduate student, which determines a living condition in which other responsibilities compete with studying an MBA, at least with the same dedication of students starting their careers.

An argument against the use of labor variables in MBA selection processes is the lack of generalized measurement criteria. This poses two challenges: (a) comparing the results of different studies and (b) explaining why these variables effects are not always significant. This is a major reason for not including this category of variables in the present review. Although it is included in a considerable number of studies, the variety of conceptual and operational definitions impeded to construct an equivalent data set. Even though the number of years of work experience is a commonly used variable, its definition differs in many studies: Some studies refer to the entire working career, whereas others consider only jobs "relevant" for MBA programs, in rather arbitrary terms or according to diverse quantitative or qualitative criteria.

These review results also shows that work experience (in terms of whether number of years accumulated or kind of experience) is not a consistent predictor of AP. However, notwithstanding the absence of standardized measures, there seems to be a certain consensus regarding the relation between work experience and AP (Arnold, Chakravarty, & Balakrishnan, 1996; Braunstein, 2002; Carver & King, 1994; Deis & Kheirandish, 2010). Some authors state that having no experience relates to lesser performance (Dreher & Ryan, 2000; Truell et al., 2006); whereas for others, experience is only needed when undergraduate studies are different from business (Adams & Hancock, 2000; Braunstein, 2006). However, most empirical evidence demonstrates that AP, no matter the way it is defined, is not related to work experience (Adams & Hancock, 2000; Clayton & Cate, 2004; DeRue, 2009; Ekpenyong, 2000; Fairfield-Sonn, Kolluri, Singamsetti, & Wahab, 2010; Fish & Wilson, 2007; Hedlund, Wilt, Nebel, Ashford, & Sternberg, 2006; Hoefler & Gould, 2000; Koys, 2010; Peiperl & Trevelyan, 1997; Sulaiman & Mohezar, 2006).

For some authors, the relevance of work experience, present or past, depends on the scope of such an experience. For example, DeRue (2009) proposed to differentiate work experience in quantitative (time) and qualitative (lived work experience) terms, considering the last one a more reasonable criteria for evaluating previous work experience as a predictor of academic success. Current job features, such as organizational position and managerial responsibilities, are not significantly related to AP (Gropper, 2007). Interestingly, in spite of being frequently mentioned in the literature, this variable has been studied in only one study. Similarly, recommendation letters were considered only in one investigation (Arnold et al., 1996), with no significant results. This result is noteworthy given the common practice of requiring labor and academic references for admission in accredited universities and business schools.

Demographic measures face similar difficulties to those of work experience, since such a category includes a set of variables that differs from one study to the other. Although gender is the most studied variable, only a small number of studies reported significant relations between it and AP, even with some inconsistencies (Braunstein, 2006; Fairfield-Sonn et al., 2010; Hoefer & Gould, 2000; Wright & Palmer, 1999). Although some differences have been found between women and men in their AP, it should be noted that gender itself is insufficient to explain the differences as other variables (such as culture, nationality, age, marital status, and work experience) are needed to improve its predictive power. It has been suggested that, although there are no differences in final AP between genders, there is indeed a difference at the beginning of the MBA as women tend to obtain lower scores in the GMAT (Hancock, 1999).

Age also yields contradictory results. In the scarce studies that found significant relations (Ahmadi et al., 1997; Bieker, 1996; Ekpenyong, 2000; Hoefer & Gould, 2000; Peiperl & Trevelyan, 1997), there seems to be no clear pattern of relations between age and AP, which suggests that such relations cannot be generalized, but depends on the specific context of each program. Regarding ethnicity and nationality, results were also unclear; however, there seems to be a pattern in the sense that studying in the country of origin (Americans in the USA, Canadians in Canada, Malaysians in Malaysia) relates to better AP, although no evidence shows that studying in a different country relates to lower performance (Fish & Wilson, 2007, 2009). The only demographic variable that seems to have a clear effect is English proficiency: Native English speakers or persons with high scores in TOEFL have better AP. This can be generalized only to English-speaking countries or MBA programs in English. An interesting question would be whether, for example, Spanish proficiency predicts performance in MBA programs in Spanish to conclude that language is a valid predictor of AP. In any case, this variable has not been widely studied. Besides, international students are not included in some studies, usually because all the information about them is not available or because it is not possible to compare it, and this reduces the sample scope and size of the

samples. Finally, one of the least studied variables is marital status, which shows significant relation to AP: Married students obtain better performance (Cao & Sakchutchawan, 2011; Peiperl & Trevelyan, 1997).

Psychological variables were included as predictors in a small number of studies, with important differences in definition and measurement. Personality was the most used, though studies differed widely in conceptual and methodological approaches, and only three in five studies found significant relations (M'Hamed et al., 2011; Rothstein, Paunonen, Rush, & King, 1994; Whittingham, 2006). The results of these three studies do not lead to solid conclusions; their standardized measures differ and reach to different profiles. Two of these studies reported only two personality traits related to high AP (openness to experience and detachment), which is insufficient to delineate a profile associated with performance.

A possible reason for the scant use of personality variables is the difficulty of incorporating them in current selection and admission processes. Using psychological criteria for selecting students might be considered restrictive, prejudiced, or even illegal. However, apart from ethical or prudential considerations, it is at least theoretically recognized the potential impact of personality factors on student motivation and, consequently, performance; for this reason, a deeper understanding of such factors would contribute to the student orientation.

Other psychological variables, such as motivation, achievement perception, satisfaction, and learning strategies, with the exception of self-efficacy, have shown significant relations to GGPA (Arnold et al., 1996; Latham & Brown, 2006; Mangum, Baugher, Winch, & Varanelli, 2005; M'Hamed et al., 2011). This suggests these variables capability for predicting AP and calls for their inclusion in further studies to accumulate evidence about their effects.

The present review enables to conclude that, according to available research findings, the best predictors of AP in MBA programs are GMAT, UGPA, and English proficiency, which confirms their use in admission processes. Other commonly used variables, such as work experience, undergraduate studies, and undergraduate institution, lack of enough empirical evidence that justify their generalized use in such processes. Psychological and demographic variables, whose effects on AP are not consistent enough, might be considered as relevant information about students and as potential candidates for research hypotheses leading to a deeper understanding of factors related to AP.

Limitations and Directions for Future Research

A crucial feature of this kind of literature review has to do with the study sample. The fact that most of the research has taken place in the United States imposes a restriction on the available data, given the global relevance and market of MBA

programs. It is urgently needed to encourage and develop similar research efforts in other countries and regions with established MBA programs to look for valid generalizations.

Two main limitations of the present work deserve highlighting. First, the databases were intentionally chosen. It is advisable to look for other nonincluded information sources that would help to enhance the study sample. Second, the present study sampling criteria—empirical and quantitative works referred to graduate students—could be revised to increase the number of studies to be included in the review.

The fact that GMAT and UGPA are the most widely used research variables should not hinder the search for, or the development of, other standardized indicators that enable understanding and evaluating academic abilities, and predicting student performance, always ensuring comparability. Work experience, a strongly recommended admission criterion by accreditation agencies worldwide, requires further theoretical development for devising operational criteria that enable the construction of a standardized, valid, reliable, and generalized measure for predicting academic success in MBA programs. Similarly, although not recommended for admission processes, psychological variables require further investigation and the development of comparable measurements for advancing in the understanding of their nature and potential predictive contribution.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research and/or authorship of this article.

References

- Adams, A. J., & Hancock, T. (2000). Work experience as predictor of MBA performance. *College Student Journal, 34*, 211-216.
- Ahmadi, M., Raiszadeh, F., & Helms, M. (1997). An examination of the admission criteria for the MBA programs: A case study. *Education, 117*, 540-546.
- Arbaugh, J. B. (2000). An exploratory study of the effects of gender on student learning and class participation in an internet-based MBA course. *Management Learning, 31*, 503-519. doi:10.1177/1350507600314006
- Arnold, L. R., Chakravarty, A. K., & Balakrishnan, N. (1996). Applicant evaluation in an Executive MBA program. *Journal of Education for Business, 71*, 277-283. doi:10.1080/08832323.1996.10116798
- Artunduaga, M. (2008). *Variables que influyen en el rendimiento académico* [Variables that influence academic performance]. Madrid, Spain. Retrieved from <http://www.ori.soa.efn.uncor.edu/?publicaciones=variables-que-influyen-en-el-rendimiento-academico-en-la-universidad>
- Association of MBAS. (2013). *MBA accreditation guidelines and criteria*. Retrieved from <http://www.mbaworld.com/en/Accreditation/Become-an-accredited-business-school.aspx>
- Baruch, Y., & Leeming, A. (2001). The added value of MBA studies: Graduates' perceptions. *Personnel Review, 30*, 589-602. doi:10.1108/EUM000000005941
- Bieker, R. (1996). Factors affecting academic achievement in graduate management education. *Journal of Education for Business, 72*, 42-46.
- Bisschoff, C. (2005). A preliminary model to identify low-risk MBA applicants. *South African Journal of Economic & Management Sciences, 8*, 300-309.
- Bisschoff, C. (2012). Empirical evaluation of a preliminary model to identify low-risk MBA applicants. *Managing Global Transitions, 10*, 189-204.
- Braunstein, A. (2002). Factors determining success in a graduate business program. *College Student Journal, 36*, 471-477.
- Braunstein, A. (2006). MBA academic performance and type of undergraduate degree possessed. *College Student Journal, 40*, 685-690.
- Cao, Y., & Sakchutchawan, S. (2011). Online vs. Traditional MBA: An empirical study of students' characteristics, course satisfaction, and overall success. *The Journal of Human Resource and Adult Learning, 7*(2), 1-12.
- Carver, M., Jr., & King, T. (1994). An empirical investigation of the MBA admission criteria for nontraditional programs. *Journal of Education for Business, 70*, 95-98.
- Chamorro-Premuzic, T., & Furnham, A. (2003). Personality predicts academic performance: Evidence from two longitudinal university samples. *Journal of Research in Personality, 37*, 319-338. doi:10.1016/S0092-6566(02)00578-0
- Christensen, D. G., Nance, W. R., & White, D. W. (2012). Academic performance in MBA programs: Do prerequisites really matter? *Journal of Education for Business, 87*, 42-47. doi:10.1080/08832323.2011.555790
- Clayton, G. E., & Cate, T. (2004). Predicting MBA no-shows and graduation success with discriminate analysis. *International Advances in Economic Research, 10*, 234-245.
- Cronin, P., Ryan, F., & Coughlan, M. (2008). Undertaking a literature review: A step-by-step approach. *British Journal of Nursing, 17*(4), 38-43. doi:10.1177/107808747000500401
- Deis, M. H., & Kheirandish, R. (2010). What is a better predictor of success in an MBA program: Work experience or the GMAT? *Academy of Educational Leadership Journal, 14*(3), 91-99.
- De La Orden, A., Máfokozí, J., & González, C. (2001). Modelos de investigación del bajo rendimiento [Research models of low academic achievement]. *Revista Complutense Educativa, 12*, 159-178.
- DeRue, D. S. (2009). *Quantity or quality? Work experience as a predictor of MBA student success*. Graduate Management Admission Council (Vol. RR-09-09). Retrieved from http://www.gmac.com/~media/Files/gmac/Research/research-report-series/tr0909_workexperience.pdf
- Dobson, P., Krapljan-Barr, P., & Vielba, C. (1999). An evaluation of the validity and fairness of the graduate management admissions test (GMAT) used for MBA selection in a UK business school. *International Journal of Selection and Assessment, 7*(4), 196-202. doi:10.1111/1468-2389.00119
- Dreher, G. F., & Ryan, K. C. (2000). Prior work experience and academic achievement among first-year MBA students. *Research in Higher Education, 41*, 505-525. doi:10.1023/A:1007036626439
- Edel, R. (2003). El rendimiento académico: Concepto, investigación y desarrollo [Academic performance: concept, research and

- development]. *REICE—Revista Electrónica Iberoamericana Sobre Calidad, Eficacia Y Cambio En Educación*, 1(2), 1-15.
- Ekpenyong, D. (2000). Empirical analysis of the relationship between students' attributes and performance: Case study of the university of Ibadan (Nigeria) MBA Programme. *Journal of Financial Management & Analysis*, 13, 54-63.
- Fairfield-Sonn, J. W., Kolluri, B., Singamsetti, R., & Wahab, M. (2010). GMAT and other determinants of GPA in an MBA program. *American Journal of Business Education*, 3(12), 77-86.
- Fish, L., & Wilson, F. (2007). Predicting performance of one-year MBA student. *College Student Journal*, 41, 507-514. Retrieved from <http://proxy.lib.sfu.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ777959&site=ehost-live>
- Fish, L., & Wilson, F. (2009). Predicting performance of MBA students: Comparing the part-time MBA program and the one-year program. *College Student Journal*, 43, 145-160. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ872225&site=ehost-live> http://www.projectinnovation.biz/csj_2006.html
- Garbanzo, G. (2007). Factores asociados Al Rendimiento Académico En Estudiantes Universitarios, Una Reflexión Desde La Calidad De La Educación Superior Pública [Factors related to academic performance of university students: a reflection from the perspective of the quality of public education]. *Factors Related to Academic Performance of University Students: A Reflection from the Perspective of the Quality of Public Education*, 31, 43-63. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=37263616&site=ehost-live>
- García, M., Alvarado, J., & Jiménez, A. (2000). La predicción del rendimiento académico: Regresión lineal versus regresión logística [The prediction of academic performance: Linear regression versus logistic regression]. *Psicothema*, 12, 248-252.
- Girón, L., & González, D. (2005). Determinantes del rendimiento académico y la deserción estudiantil, en el programa de economía de la Pontificia Universidad Javeriana de Cali [Determinants of academic performance and dropout in the faculty of economics at Pontificia Universidad Javeriana Cali]. *Economía, Gestión Y Desarrollo*, 3, 173-201. Retrieved from http://revistaeconomia.puj.edu.co/html/articulos/Numero_3/9.pdf
- Graduate Management Admission Council. (n.d.). *Validity, reliability & fairness*. Retrieved from <http://www.gmac.com/gmat/the-gmat-advantage/validity-reliability-fairness.aspx>
- Goberna, M., López, M., & Pastor, J. (1987). La predicción del rendimiento como criterio para el ingreso en la Universidad [Performance prediction as a criterion for university admission]. *Revista de Educación*, 283, 235-248.
- Gropper, D. M. (2007). Does the GMAT matter for executive MBA students? Some empirical evidence. *Academy of Management Learning & Education*, 6, 206-216. doi:10.5465/AMLE.2007.25223459
- Hancock, T. (1999). The gender difference: Validity of standardized admission tests in predicting MBA performance. *Journal of Education for Business*, 75, 91-93.
- Hedlund, J., Wilt, J. M., Nebel, K. L., Ashford, S. J., & Sternberg, R. J. (2006). Assessing practical intelligence in business school admissions: A supplement to the graduate management admissions test. *Learning and Individual Differences*, 16, 101-127. doi:10.1016/j.lindif.2005.07.005
- Hoefler, P., & Gould, J. (2000). Assessment of admission criteria for predicting students' academic performance in graduate business programs. *Journal of Education for Business*, 75, 225-229. doi:10.1080/08832320009599019
- House, J., Hurst, R., & Keely, E. (1996). Relationship between learner attitudes, prior achievement, and performance in a general education course: A multi-institutional study. *International Journal of Instructional Media*, 23, 257-271.
- Jackson, D. N. (1984). *Personality Research Form manual*. Port Huron, MI: Research Psychologists Press.
- Kass, D., Grandzol, C., & Bommer, W. (2012). The GMAT as a predictor of MBA performance: Less success than meets the eye. *Journal of Education for Business*, 87, 290-295. doi:10.1080/08832323.2011.623196
- Kelan, E. K., & Jones, R. D. (2010). Gender and the MBA. *Academy of Management Learning & Education*, 9, 26-43. doi:10.5465/AMLE.2010.48661189
- Koys, D. (2010). GMAT versus alternatives: Predictive validity evidence from Central Europe and the Middle East. *Journal of Education for Business*, 85, 180-185. doi:10.1080/08832320903258618
- Koys, D. J. (2005). The validity of the graduate management admissions test for non-U.S. students. *Journal of Education for Business*, 80, 236-239. doi:10.3200/JOEB.80.4.236-239
- Kumar, R. (2011). Correlation study of mat score, IQ and GPA of MBA students. *The IUP Journal of Management Research*, 10(1), 28-36.
- Kuncel, N. R., Credé, M., & Thomas, L. L. (2007). A meta-analysis of the predictive validity of the Graduate Management Admission Test (GMAT) and Undergraduate Grade Point Average (UGPA) for graduate student academic performance. *Academy of Management Learning & Education*, 6, 51-68. doi:10.5465/AMLE.2007.24401702
- Latham, G. P., & Brown, T. C. (2006). The effect of learning vs. outcome goals on self-efficacy, satisfaction and performance in an MBA program. *Applied Psychology*, 55, 606-623. doi:10.1111/j.1464-0597.2006.00246.x
- Loucopoulos, C., Gutierrez, C., & Hofler, D. (2007). Reassessment of the relative weights of GPA and GMAT in the MBA admission decision process. *Academy of Information and Management Sciences Journal*, 10(2), 91-97.
- Mangum, W. M., Baugher, D., Winch, J. K., & Varanelli, A. (2005). Longitudinal study of student dropout from a business school. *The Journal of Education for Business*, 80, 218-221.
- M'Hamed, A., Chen, J., & Yao, W. (2011). Journal of technology management in China article information. *Journal of Technology Management in China*, 6, 43-68.
- Murray, M. (2011). MBA share in the US graduate management education market. *Business Education & Accreditation*, 5, 29-40.
- Musayon, F. (2001). Relación entre el ingreso y el rendimiento académico de las alumnas de enfermería entre 1994-1997 [The relationship between income and academic performance of nursing students between 1994-1997]. *Universidades*, 22, 17-30. Retrieved from <http://cat.inist.fr/?aModele=afficheN&cpsid=13602090>
- Oh, I. S., Schmidt, F. L., Shaffer, J. A., & Le, H. (2008). The graduate management admission test (GMAT) is even more valid than we thought: A new development in meta-analysis and its implications for the validity of the GMAT. *Academy of*

- Management Learning & Education*, 7, 563-570. doi:10.5465/AMLE.2008.35882196
- Parahoo, K. (2006). *Nursing research—principles, process and issues*. Houndmills, UK: Palgrave Macmillan.
- Peiperl, M. A., & Trevelyan, R. (1997). Predictors of performance at business school. *Journal of Management Development*, 16, 354-367.
- Pérez, E., Cupani, M., & Ayllón, S. (2005). Predictores de rendimiento académico en la escuela media: Habilidades, autoeficacia y rasgos de personalidad [Predictors of academic performance in middle school: Skills, self-efficacy and personality traits]. *Avaliacao Psicológica*, 4(1), 1-11.
- Ramdhani, A., Ramdhani, M. A., & Amin, A. S. (2014). Writing a literature review research paper. *International Journal of Basic and Applied Science*, 3, 47-56.
- Rothstein, M. G., Paunonen, S. V., Rush, J. C., & King, G. (1994). Personality and Cognitive Ability Predictors of Performance in Graduate Business School. *Journal of Educational Psychology*, 86, 516-530. doi:10.1037/0022-0663.86.4.516
- Sally. (2013). *A synthesis matrix as a tool for analyzing and synthesizing prior research*. Retrieved from <http://www.academiccoachingandwriting.org/dissertation-doctor/dissertation-doctor-blog/iii-a-synthesis-matrix-as-a-tool-for-analyzing-and-synthesizing-prior-resea>
- Sánchez, J., & Ato, M. (1989). Meta-análisis: Una alternativa metodológica a las revisiones tradicionales de la investigación [Meta-analysis: A methodological alternative to traditional research reviews]. In J. Arnau & H. Carpintero (Eds.), *Tratado de psicología general* (Vol. I, pp. 617-669). Madrid, Spain: Alhambra.
- Sánchez-Meca, J. (2003). La revisión del estado de la cuestión: El meta-análisis [The review of the state of affairs: The meta-analysis]. *Enfoques, Problemas Y Métodos de Investigación En Economía Y Dirección de Empresas*, 1, 101-110. Retrieved from <http://www.um.es/metaanalysis/pdf/6216.pdf>
- Sireci, S., & Talento-Miller, E. (2006). Evaluating the predictive validity of graduate management admission test scores. *Educational and Psychological Measurement*, 66(2), 305-317.
- Stolzenberg, R. M., & Relles, D. (1991). Foreign student academic performance in U.S. graduate schools: insights from American MBA programs. *Social Science Research*, 92, 74-92.
- Sulaiman, A., & Mohezar, S. (2006). Student success factors: Identifying key predictors. *Journal of Education for Business*, 81, 328-333. doi:10.3200/JOEB.81.6.328-333
- Talento-Miller, E., & Rudner, L. M. (2005). *GMAT® validity study summary report for 1997 to 2004*. Graduate Management Admission Council. Retrieved from http://www.gmac.com/~media/Files/gmac/Research/validity-and-testing/RR0506_VSSSummaryReport.pdf
- Torres, L., & Rodríguez, N. (2006). Rendimiento académico y contexto familiar en estudiantes universitarios [Academic achievement and family background in university students]. *Enseñanza E Investigación En Psicología*, 11, 255-270.
- Truell, A., Zhao, J., Alexander, M., & Hill, I. (2006). Predicting final student performance in a graduate business program: The MBA. *The Delta Pi Epsilon Journal*, 48, 144-152.
- Whittingham, K. L. (2006). Impact of personality on academic performance of MBA students: Qualitative versus quantitative courses. *Decision Sciences Journal of Innovative Education*, 4, 175-190. doi:10.1111/j.1540-4609.2006.00112.x
- Wooten, B., & McCullough, C. (1991). Does work experience help or harm students in MBA programs? *Business Forum*, 16(4), 12-14.
- Wright, R. E., & Bachrach, D. G. (2003). Testing for bias against female test takers of the graduate management admissions test and potential impact on admissions to graduate programs in business. *Journal of Education for Business*, 78, 324-328.
- Wright, R. E., & Palmer, J. C. (1994). GMAT scores and undergraduate GPAs as predictors of performance in graduate business programs. *Journal of Education for Business*, 69, 344-348. doi:10.1080/08832323.1994.10117711
- Wright, R. E., & Palmer, J. C. (1997). Examining performance predictors for differentially successful MBA students. *College Student Journal*, 31, 276.
- Wright, R. E., & Palmer, J. C. (1999). Predicting performance of above and below average performers in graduate business schools: A split sample regression analysis. *Educational Research Quarterly*, 22(4), 72-79. Retrieved from <http://www.redi-bw.de/db/ebSCO.php/search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ576550&site=ehost-live>
- Yang, B., & Lu, D. R. (2001). Predicting academic performance in management education: An empirical investigation of MBA success. *Journal of Education for Business*, 77(1), 15-20. doi:10.1080/08832320109599665
- Zwick, R. (1993). The validity of the GMAT for the prediction of grades in doctoral study. *Journal of Educational Statistics*, 18(1), 91-107. doi:10.3102/10769986018001091

Author Biographies

Silvana Dakduk is a social psychologist, with a PhD in psychology from the Catholic University Andrés Bello, Venezuela. She is full associate professor of consumer and organizational behavior at Colegio de Estudios Superiores de Administración (CESA).

José Malavé is a social psychologist, with a PhD in organizational behavior from the University of Lancaster, the United Kingdom. He is full professor of organizational behavior, business ethics, and general management at Instituto de Estudios Superiores de Administración (IESA), in Caracas, Venezuela, where he has served since 1985.

Carmen Cecilia Torres is a human resources specialist from the Catholic University Andrés Bello, Venezuela. She served as a professor of human resources at IESA, Venezuela. She is a doctoral student in social science at Universidad Simon Bolivar (USB) in Venezuela.

Hugo Montesinos is a production engineer who holds an MS in statistics and a PhD in engineering with concentration in statistics from USB. He served as a professor in the Department of Scientific Computing and Statistics at USB and professor of the Center of Finance at IESA, both in Caracas, Venezuela. He is a doctoral candidate in economics at Florida State University, where he has served as research assistant, teaching assistant, and instructor.

Laura Michelena is a psychologist graduated from Universidad Católica Andrés Bello (UCAB). She is a research assistant in the Center of Management and Leadership at Instituto de Estudios Superiores de Administración. She has served as a professor in Statistics and Research Methodology in the Psychology Undergraduate Degree at UCAB.