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Academic Anxiety: Correlation between Dass-21 Test Scores and Academic Achievement

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Abstract: The main objective of this study was to determine the correlations between anxiety test scores and academic achievement using a quantitative methodology based on a non-experimental and correlational study. In addition, the following variables were considered: gender, school averages, educational cycle, and grade level. The sample comprised 275 students from two schools (middle and high schools) in the provincial administration of Mediouna. In order to collect the information, the participants were asked to complete the Dass 21 test. It should be noted that the results obtained were processed using IBM SPSS 23 software. The results showed a significant correlation between strong and moderate intensities. Ultimately, considerable effort is needed to better understand the multidimensionality of academic achievement and to ensure effective and relevant educational interventions.

Keywords: academic achievement, anxiety, learner, educational intervention, correlation.

学业焦虑：达斯-21考试成绩与学业成绩之间的相关性

摘要：本研究的主要目的是使用基于非实验和相关研究的定量方法来确定焦虑测试分数与学业成绩之间的相关性。此外，还考虑了以下变量：性别、学校平均水平、教育周期和年级水平。样本包括来自梅迪乌纳省政府两所学校（初中和高中）的275名学生。为了收集信息，参与者被要求完成达斯21测试。应当指出的是，获得的结果是使用国际商业机器公司统计软件23软件进行处理的。结果显示强强度和中等强度之间存在显着相关性。最终，需要付出相当大的努力来更好地理解学业成就的多维性，并确保有效和相关的教育干预。

关键词：学业成就、焦虑、学习者、教育干预、相关性。

Introduction

Social psychology is a discipline that studies human behavior from a social perspective and questions the cognitive and affective processes and mechanisms involved [1]. Unlike school psychology, it is interested in children, youth, and families in an educational situation. It analyzes different phenomena to promote environments conducive to learning.

Anxiety related to school tasks and tests, pressure to get better grades, and fear of receiving poor grades are the most common sources of stress cited by school-age

children and adolescents.

Students who suffer from anxiety are more likely to perform poorly, be frequently absent from school, and drop out of school altogether [2, 3]. Excessive levels of anxiety can also negatively affect students' social and emotional development and sense of self-worth, cause students to use chemical substances to reduce stress, and lead to burnout [4, 5].

Anxiety, then, is a practical example that occupies thinking in school psychology, defined as "painful or apprehensive discomfort of the mind, usually due to impending or anticipated illness" [6], or even a basic human emotion that consists of fear and uncertainty, through the evaluation of a situation "seen" as threatening. This usually occurs when an individual believes that the event is a threat to themselves or their self-esteem [7].

Statistically speaking, anxiety disorders are the most dispersed class of mental disorders, with 11.6% of individuals worldwide having an anxiety disorder. Individuals with this disorder are predisposed to experience excessive fear and/or anxiety responses to perceived threats, which can lead to significant distress or impaired functioning [8]. Some research on test anxiety has focused on gender differences, and girls have been repeatedly found to have higher anxiety states than boys [9].

Research has shown that a moderate level of academic anxiety is essential for motivating students to work for exams and can lead to better results [10-12]. In addition, some people may only experience anxiety for exams or other specific tasks. Anxiety is not always negative. Some students may be motivated by anxiety [13]. However, this anxiety can affect students' academic success. Research findings have shown negative correlations between students' academic success and anxiety. In addition, the performance of learners with high academic anxiety is different from that of learners with low academic anxiety [14].

1. Materials and Methods

1.1. Participants

We conducted an exploratory survey of 275 students in two schools in the provincial directorate of Mediouna (the provincial directorate of Mediouna is an independent administrative district but linked to the Academy of Casablanca-Settat), which enabled us to conduct our experiment. For middle school, there are 141 students, with 28% men and 23.27% women. For the high school, there are 134 students, with 22.54% men and 26.18% women. They were contacted through random sampling, and prior to data collection, academics were contacted to determine their availability and degree of agreement with the purpose of the study. The characteristics of the study participants are presented in Table 1.

The average age of our population is 14.87 years. In middle school, the average age of boys is about 14.04 years, while the average age of girls is about 13.91 years. In high school, the average age is approximately 16.74 years (16.66 years for boys and 16.80 years for girls) (Table 2).

Table 1 Percentage of students by gender and grade

School cycle	Grade	Female		Male		Total	
		N	%	N	%	N	%
Middle school	1st grade	19	6.9 %	24	8.72%	43	15.63%
	2nd grade	21	7.63%	25	9.02%	46	16.72%
	3rd grade	24	8.72%	28	10.18%	52	18.90%
	Total	64	23.27%	77	28%	141	51.27%
High school	2rd grade	35	12.7%	29	10.54%	64	23.27%
	3rd grade	37	13.45%	33	12%	70	25.45%
	Total	72	26.18%	62	22.54%	134	48.73%
Total		136	49.45%	139	50.54%	275	100.0%

Table 2 Average age by gender and grade

School cycle	Grade	Female		Male		Total	
		Average	SD[1]	Average	SD	Average	SD
Middle school	1st grade	12.86	1.13	13.02	1.29	12.94	1.22
	2nd grade	13.71	,97	13.80	,98	13.75	,97
	3rd grade	15.15	1.15	15.19	1.25	15.17	1.20

Continuation of Table 2

	Total	13.91	1.43	14.04	1.51	13.97	1.47
High school	2rd grade	16.93	.75	16.73	.74	16.82	.72
	3rd grade	18.15	1.14	17.74	.69	18.00	1.08
	Total	16.80	1.30	16.66	.92	16.74	1.22
Total		374	14.96	1.97	14.78	1.83	14.87

[1] Standard deviation

The following table (Table 3) shows that the study population comprises five classes (275 students), two classes in the high school division (134 students), and three classes in the middle school division (141 students) sharing almost similar characteristics: the GPA is 13.37 for middle school students and 14.92 for high school students. In terms of grades, 88 middle school students scored below 10/20 and 77 high school students scored above 15/20.

Table 3 Overall student average

School cycle	School level	Average	Grade >= 15	Grade >= 10	Grade <= 10
Middle school	1st grade	13,69	16	27	4
	2nd grade	12,77	9	30	7
	3rd grade	13,65	12	31	5
	Total	13,37	37	88	16
High school	2rd grade	13,89	23	39	4
	3rd grade	15,91	54	14	0
	Total	14,92	77	53	4
Overall total		14,13	114	141	20

1.2. Instruments

1.2.1. Dass-21

The Depression, Anxiety and Stress Scale - 21 items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress. We are interested in the section that deals with anxiety (7 items).

1.2.2. School Results

The students' grades were retrieved from the "MASSAR platform" (the "MASSAR" platform is a school management system adopted by the Moroccan Ministry of National Education). It consists of 8 grades of school subjects as well as the general average as follows: Sports Physical Education (EPS); Islamic Education (IE); Physics (PC); Life Sciences (LS); Mathematics (Math); History & Geography (HG); French (Fr); Arabic (Ar).

1.3. Design

A quantitative approach is used: an empirical and correlational study that analyzes the effect of anxiety on academic achievement as a function of age, grade, and level. We administered the tests to students of different ages and grade levels simultaneously.

1.4. Data Analysis

Analyses of the relationship between anxiety and academic achievement using Bravais Pearson correlation analyses are presented as correlation matrices (n, p, r, r2). Partial correlations were used to examine all of these associations (controlling for age, grade, and cycle). They are presented as the mean and standard deviation. The significance level was set at ($p < 0.05$). Data were processed using SPSS 26 IBM, IC, Chicago.

2. Results

2.1. Correlation between Anxiety and Academic Performance

The following table (Table 4) shows the results of the normality tests. We have a significance value of 0.000 for the overall mean, which is well above the significance level of p-value 0.05, which allows us to conclude that the data normality is normal.

Table 4 Normality test results

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistics	Ddl	Sig.	Statistics	Ddl	Sig.
Overall average	,113	275	,000	,905	275	,000

a. Correction of the meaning of Lilliefors

At the middle school level, 27.64% of students have moderate anxiety, 11.27% have severe anxiety, and 0.36% have extremely severe anxiety. On the other hand, at the high school level, 21.45% of the students had a moderate anxiety state, 20.00% had a severe state, and 0.36% had a normal score. Note that 1Bac students showed a zero score in the "normal" anxiety state. The same is true for 1AC and 2AC students in the "extremely severe" condition. In general, the majority of students in both divisions showed a "moderate" anxiety score of 49.09% (Table 5).

Table 5 Scores on the scale measuring anxiety in students according to grade level

School cycle	Grade		Normal	Light	Moderate	Severe	Extremely severe
Middle school	1AC	N	5	9	23	10	0
		%	1,82%	3,27%	8,36%	3,64%	0%
	2AC	N	3	5	28	10	0
		%	1,09%	1,82%	10,18%	3,64%	0%
	3AC	N	3	8	25	11	1
		%	1,09%	2,91%	9,09%	4,00%	0,36%
	Total	N	11	22	76	31	1
		%	4,00%	8,00%	27,64%	11,27%	0,36%
High school	1 Bac	N	0	9	32	20	5
		%	0%	3,27%	11,64%	7,27%	1,82%
	2 Bac	N	1	3	27	35	2
		%	0,36%	1,09%	9,82%	12,73%	0,73%
	Total	N	1	12	59	55	7
		%	0,36%	4,36%	21,45%	20,00%	2,55%
Overall average		N	12	34	135	86	8
		%	4,36%	12,36%	49,09%	31,27%	2,91

Table 6 shows the results of the normality tests. We have a significance value of 0.000 for the score, which is well above the significance level of p-value 0.05, which allows us to conclude that the normality of data is normal.

Table 6 Results of the normality test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistics	Ddl	Sig.	Statistics	Ddl	Sig.
Score	,257	275	,000	,859	275	,000

a. Correction of the meaning of Lilliefors

Table 7 shows the anxiety scale scores as a function of the overall average, presented in terms of intervals (Nt >= 15; 15 > Nt >= 10 and 10 > Nt). For the first interval, 13.45% of the students had a "moderate" score, 24% had severe anxiety, and 0.36% normal. Students belonging to the second interval had a moderate anxiety state (33.45%), 9.09% had a mild state, and 0% extremely severe. Finally, 2.55% of the students with an overall score below 10/20 had "mild", 2.18% "normal" and "moderate". Note that students belonging to the last two intervals (15 > Nt >= 10 and 10 > Nt) have a score of zero for "extremely severe".

Table 7 Scores on the student anxiety scale based on the grade point average

Note		Normal	Light	Moderate	Severe	Extremely severe
Nt >= 15	N	1	2	37	66	8
	%	0,36%	0,73%	13,45%	24,00%	2,91%
15> Nt >= 10	N	5	25	92	19	0
	%	1,82%	9,09%	33,45%	6,91%	0%
10 > Nt	N	6	7	6	1	0
	%	2,18%	2,55%	2,18%	0,36%	0%
Total	N	12	34	135	86	8
	%	4,36%	12,36%	49,09%	31,27%	2,91%

Table 8 presents the correlation between anxiety scale scores and the overall mean. Indeed, it shows a positive and highly significant relationship ($r = .593$, $p = .000 < .01$).

Table 8 Correlation between anxiety scale scores and the overall student average

		General average	Score
General average	Correlation of Pearson	1	,593**
	Sig. (Bilateral)		,000
	N	275	275
Score	Correlation of Pearson	,593**	1
	Sig. (Bilateral)	,000	
	N	275	275

** Correlation is significant at the 0.01 level (two-tailed).

When this correlation was controlled for age (Table 9), grade level (Table 10), and educational cycle (Table 11). The relationship was found to be highly significant (p = 0.000) with moderate intensity.

Table 9 Correlation between anxiety scale scores and overall student average by age

Control variables			General average	Score
Age	General average	Correlation	1,000	,554
		Significance (bilateral)		,000
		ddl	0	272
	Score	Correlation	,554	1,000
		Significance (bilateral)	,000	
		ddl	272	0

Table 10 Correlation between anxiety scale scores and overall student average controlled by grade level

Control variables			General average	Score
School level	General average	Correlation	1,000	,548
		Significance (bilateral)	.	,000
		ddl	0	272
	Score	Correlation	,548	1,000
		Significance (bilateral)	,000	.
		ddl	272	0

Table 11 Correlation between anxiety scale scores and overall student average controlled by grade level

Control variables			General average	Score
School cycle	General average	Correlation	1,000	,553
		Significance (bilateral)	.	,000
		ddl	0	272
	Score	Correlation	,553	1,000
		Significance (bilateral)	,000	.
		ddl	272	0

3. Discussion

We recall that the objective of this research was to measure the correlation between anxiety and students' academic results. It aims to situate the state of anxiety of the student according to his / her school level, cycle of education (college and high school), and age. To do this, we used the DASS-21 test, which measures the state of anxiety, stress, and depression using a quantitative approach based on the distribution of the questionnaire among the students and the analysis of their school results.

Our first results showed that 27.64% of the students had a moderate state of anxiety, 11.27% had a severe state, and 0.36% had an extremely severe. In contrast to high school, 21.45% of the students had a moderate anxiety state, 20.00% had a severe state, and 0.36% had a normal score. The 1Bac students showed a zero score in the "normal" state of anxiety. The same case for the 1AC and 2AC students at the "extremely severe" state.

This is confirmed by Mazzone et al. [15] who examined the prevalence of anxiety and the relationship between anxiety and academic performance in North American elementary (8-10 years old), middle school (11-13 years old), and high school (14-16 years old) students and found that anxiety rates varied by grade. They found that the rate of anxious children was 2.3% in elementary school, 7.9% in middle school, 15.9% in high school, and 14.1% among students with failing grades, 9.4% among those with passing grades, and 3.9% among those with good or excellent grades. Their conclusion is that the prevalence of abnormally high self-reported anxiety levels increases in frequency with age and is negatively associated with academic performance.

However, other findings suggest that the desire for higher achievement has put a lot of pressure on students, making them academically anxious [16-18]. High parental expectations, social demands, social disapproval, and increasing peer aspiration levels contribute greatly to students' anxiety in academic situations. Thus, academic anxiety is experienced when

the characteristics of anxiety are associated with an academic or evaluative situation. Academic anxiety is an integral part of a student life and cannot be eliminated if they are to achieve their goal. Anxious students often have difficulty concentrating while studying, remembering facts, etc., which can develop a sense of helplessness and failure [19, 20].

Our second results, which also concern the scores of the scale measuring anxiety in students according to the grade level, concluded that for the first interval (Nt >= 15), 13.45% of the students had a "moderate" score, 24% had a severe anxiety state, and 0.36% normal. The students belonging to the second interval (15> Nt >= 10) had a moderate anxiety state (33.45%), 9.09% had a mild state, and 0% extremely severe. Finally, 2.55% of the students with an overall score lower than 10/20 have a "mild" score, 2.18% "normal" and "moderate". Note that students belonging to the last two intervals (15> Nt >= 10 and 10 > Nt) have a score of zero for "extremely severe".

Previous studies suggest that there is a significant relationship between academic achievement and anxiety [21]. Indeed, a positive relationship exists between a good level of academic achievement and a low level of anxiety [22]. Similarly, anxiety symptoms are extremely present during childhood or adolescence and can negatively impact general well-being, social life, academic performance, and social skill development [23, 24]. It is common for students to perform poorly when they are under task pressure or when they have high levels of anxiety, which suggests that high levels of anxiety are associated with poor academic performance [15, 25].

Contrary to Mahato and Jangir [26], who stated that without anxiety, most people would not have the motivation to complete a task regardless of its nature. Subsequently, an optimal level of academic anxiety is important to motivate students to prepare for exams and perform better. It is observed that a high level of anxiety interferes with some concentration abilities and affects memory, which Lukasik et al. [27] mentioned in their research on the relationship between anxiety and stress and working memory performance.

Our last results show the correlation between anxiety scale scores and the overall average. Indeed, it shows a positive and highly significant relationship. When this correlation is controlled by age, education level, and educational cycle. We note that the relationship is highly significant with moderate intensity.

Across OECD countries, 59 students reported that they were often worried about test difficulty and 66% worried about low grades. Approximately 55 students said they were nervous about taking an exam, even if they were well-prepared; 37% reported feeling very stressed while studying; and 52% reported feeling nervous when they did not know how to solve an academic task. There is a weak negative correlation between the performance of the education system in the PISA survey and self-reported anxiety. Of the three countries where students reported the highest levels of schoolwork anxiety, Brazil and Costa Rica scored significantly below average, while Singapore was the highest performing country [28].

Students who attend schools with high achievement levels are more likely to develop anxiety about schoolwork, especially if they feel that they cannot keep up with their peers and if teachers and school leaders value rankings and class competition. Parents of students in elite schools often pay high tuition fees and hope that their children will enter the best universities. These elite schools are becoming increasingly selective, and some are responding to this competitive environment by offering more challenging courses that are not always developmentally appropriate for the student. Students in these schools may feel caught in a cycle of increasing demands that are largely beyond their control [29].

However, family attitudes can lead to anxiety, teacher attitudes, activities not appropriate to the student's level, poor lesson perception, lack of role models, negative experiences, test anxiety, and the social environment [30]. How teachers communicate with students about homework and tests is also important. Under pressure to improve students' test scores, teachers may emphasize the need to perform well on tests in order to get into better jobs or college later [31]. However, these appeals to students' fears can make them feel threatened and make them much more anxious [32].

4. Conclusion

In conclusion, anxiety as a whole can affect students regardless of their characteristics. It is the result of a series of events in both personal and academic life where the difference lies in managing or optimizing anxiety to make it a positive energy that pushes the student to adopt a positive attitude away from learning. The focus must be on programs and curricula so that they are adapted to the psychological needs of the learner. Similarly, for the teacher who is the mediator of knowledge and who wants the student to learn in the best possible conditions, efforts must be made in this direction to contribute to improving the mental health of the learner and to make him/her an "active agent" in order to learn better and more.

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