

# School success, attitude towards science and interpersonal relations \*

## Éxito escolar, actitud hacia las ciencias y relaciones interpersonales \*

## Sucesso escolar, atitude para a ciência e relações interpessoais\*

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### Abstract

Students who are excellent in their academic performance face challenges and difficulties associated with the social relationships they develop when living within the school environment. In similar studies, there are limitations such as the identification of the variables involved without reaching the level of correlation in the educational experience. The main objective of this research is to evaluate the impact of high academic performance on the interpersonal relationships of young adolescents in the I.E. College of the Sacred Heart of Jesus. The methodology used responds to the mixed approach, in the quantitative field follows a correlational method, from the qualitative field follows an ethnographic method, is designed for

three phases and applies the instruments of the Davis empathy test (IRI), interview and non-participant observation. The results obtained show that there is a significant relationship between the academic success of the students and the quality of the relationships they have with their classmates, in general they tend to be less emotional and interested in cultivating significant bonds. Nowadays it is essential to consider in a holistic way the educational experience of the new generations, especially before the possibility of forming integral and well-being human beings that can be assertive in front of the obstacles of the future.

**Key words:** school success, interpersonal relationships, academic performance.

### Resumen

Los estudiantes excelentes en su rendimiento académico enfrentan retos y dificultades asociados a las relaciones sociales que desarrollan al convivir dentro del ámbito escolar. En estudios similares se encuentran limitantes como la identificación de las variables involucradas sin llegar a establecer su nivel de correlación en la experiencia educativa. El objetivo de la investigación fue evaluar el impacto del alto rendimiento académico en las relaciones interpersonales de los jóvenes adolescentes. La metodología empleada responde al enfoque mixto, en el ámbito cuantitativo sigue un método correlacional, diseño factorial, desde el ámbito cualitativo sigue un método etnográfico, está diseñada para tres fases y aplica instrumentos del test de empatía de Davis (IRI) y test mini-mental a 1140 estudiantes con alto rendimiento académico, entrevista y observación. Los resultados obtenidos reflejan que existe una relación significativa entre el éxito académico de los estudiantes, la edad, el funcionamiento cognitivo, la actitud hacia las ciencias y la calidad de las relaciones que tienen con sus compañeros, en general tienden a mostrarse menos emocionales e interesados en cultivar lazos significativos. En la actualidad resulta esencial considerar de manera holística la experiencia educativa de las nuevas generaciones, especialmente ante la posibilidad

de formar seres humanos integrales y con bienestar que puedan ser asertivos frente a los obstáculos del futuro. Se concluye que el funcionamiento cognitivo, tiene un efecto directo y positivo sobre la dimensión utilitaria o instrumental de la motivación y actitud hacia las ciencias donde el estudiante exitoso concede más importancia y, en consecuencia, presta más atención a la componente emocional por la ciencia

**Palabras clave:** éxito escolar, relaciones interpersonales, rendimiento académico.

### Resumo

Alunos excelentes em seu desempenho acadêmico enfrentam desafios e dificuldades associados às relações sociais que desenvolvem quando vivem dentro do ambiente escolar. Em estudos semelhantes, existem limitações, como a identificação das variáveis envolvidas, sem atingir o nível de correlação na experiência educacional. O objetivo da pesquisa foi avaliar o impacto do alto desempenho acadêmico nas relações interpessoais de jovens adolescentes. A metodologia responde à abordagem mista no nível quantitativo segue um método de correlação, design fatorial, do campo qualitativa segue método etnográfico é projetado para trifásico e aplica teste instrumentos empatia Davis (IRI) e teste de mini- educação mental para 1140 alunos com alto desempenho acadêmico, entrevista e observação. Os resultados mostram que existe uma relação significativa entre o sucesso acadêmico dos alunos, a idade, o funcionamento cognitivo, atitude em relação à ciência e à qualidade dos relacionamentos que têm com os seus pares, em geral, tendem a ser menos emocional e interessados no cultivo de laços significativos. Atualmente, é essencial considerar de forma holística a experiência educacional das novas gerações, especialmente diante da possibilidade de formar seres humanos integrais e de bem-estar que possam ser assertivos frente aos obstáculos do futuro. Conclui-se que o funcionamento cognitivo tem

um efeito direto e positivo sobre a dimensão utilitária ou instrumental de motivação e atitude para com a ciência onde o aluno bem sucedido dá mais importância e, portanto, prestar mais atenção ao componente emocional pela ciência.

**Palavras-chave:** sucesso escolar, relações interp

### Introduction

School success at the international level is assumed by UNESCO (2008) as the articulated presence of a group of key factors, among which are infrastructure, a low rate of absenteeism, families that support students and good weather within the educational coexistence. In that sense the Educational Institutions (IE) are spaces that encourage and witness the development by stages, which human beings experience from their childhood to adulthood, this is one of their main characteristics because they are involved in shaping, to a certain extent, the personality of the students, that is, their attitudes, behaviours and visions about life (Duek, 2010).

In the perspective of authors such as Hallinger and Heck (2014) a deep and holistic vision of educational institutions is required, as the scenario where young people reciprocally acquire their guidelines on leadership and coexistence. In his vision, the same importance should be assigned to social skills as is usually done for traditional theoretical knowledge. Reasons about what motivates the success or failure of a student have focused on Vergel, Parra, Zafra (2018) in their capacity and dedication.

In the question of the impact of academic success in interpersonal relationships, reasons arise in young people, which leads them to behave and socialize with others, only to be considered the best in the class, while there are others who face difficulties to maintain the rhythm and self-confidence, meanwhile, some are dedicated to ridicule those who have academic success. This spectrum of attitudes towards the educational experience influences the quality of the interpersonal relationships that are created there and constitutes an issue that is permanently feedback, since feeling accepted or excluded is

considered a psychosocial factor that can determine the student performance.

With the purpose of putting together the complete puzzle that implies the current coexistence of the institution, it is proposed to demolish the appearances that may contain the grades, numbers and letters, to get to know how young students really feel in the teaching process -learning, and how they consider that their expectations of personal excellence affect or contribute to their ability to have quality relationships with their partners.

Faced with variables immersed in academic success, school performance has presented changes in accordance with the evolution of pedagogical trends, since "from a humanist approach, academic performance is the product that gives students in schools and that is usually expressed through school grades "(Martínez Otero, 2007, p.34), a perspective that condenses general ideas about this issue, visible in the qualifications, therefore, it is usually analysed mainly from two approaches : the quantitative that has behavioural and cognitivist nuances or the qualitative one, in the latter the learning styles, predispositions and personal characteristics of the student that provide a more human look are identified.

Due to the above, pedagogical and social nuances are observed, since expectations and motivations occupy a fundamental space in it. As explained by Martí (2003) in which factors such as the intellectual level, personality, motivation, skills, interests, study habits, self-esteem or teacher-student relationship are involved; When there is a gap between the academic performance and the expected performance of the student, we talk about discrepant performance; Unsatisfactory academic performance is one that is below the expected performance (page 376).

In the context of this proposal, performance is not seen as a purely academic concept, but the influence of social factors is recognized in it and that is the theoretical line that is sought to be developed as the foundation of the project, since in this way identify other elements that are

responsible for promoting and shaping their development in classrooms. In this sense we do not want to see the student as an isolated entity that self-determines itself, but as the result of a series of stimuli originated in "the diversity of factors that affect performance, specifying additionally that this depends not only of intellectual aptitudes, but of a series of interrelated factors, both internal and external to the student "(cited in Tomás, Expósito and Sampere, 2014, page 381).

The interrelation is presented as the key to analyse the performance because it allows to see how the different aspects related to the educational experience are put in common and lead to identify the main elements that determine the context of an institution and a specific group. There are two currents that contrast in their understanding, on the one hand, behaviourism stresses that "there is learning when there is a behavioural change; as observable and identifiable behaviour "(Pozo, 2005) while cognitivism focuses on the elements that produce cognitive functions in the brain:" variables such as ideas, thoughts, elaboration of plans, the use of memory, the ability to learn "(Bedia and Castillo, 2010, p.122). However, both perspectives are foundational theories within the pedagogical exercise and are complementary when they approach the analysis of performance, since both have successes and describe the bases on which the teaching-learning processes are based, which finally are the essence that articulates and makes it possible to obtain academic performance as the most visible end result of educational experiences

On the other hand, the analysis of social relations is generally focused on that these are positive and contribute to the development of human beings, its object is explained by Choque and Chirinos (2009) through the social skills that it defines as: "The abilities and skills in the socio-affective area of people, social skills, cognitive and emotional management that allow them to successfully face the demands, demands and challenges of daily life, acting competently and contributing to human development" (p. 172). In the school scenarios from the disciplinary perspective, the imperative is stressed that all social actors have

good relations to ensure the proper development of academic processes, however, as a living dynamic always faces conflicts, risks and difficulties, which rarely they are addressed and transformed in the institutional context.

Assertiveness is a normal form of behaviour that emerges as emphasized by Naranjo (2008) in the certainty that: all human beings have rights, opinions and claims that affect other people and in various occasions the only way to achieve that these are heard opinions, those claims are met and those rights are respected is to raise your voice and defend what the person seems to be entitled to for some reason (p.8). In this sense it is important to recognize the existence of the conflict that originates from the diversity of experiences and opinions, since people will not always agree, but what is really interesting is to see how they achieve consensus that positively impact their interpersonal relationships.

The educational process according to Morin must respond to the notion of homo complexus "in whom rationality and irrationality are combined, emotionality with their ability to love, to live in society and, in general, all those elements that make them just and truly human "(cited in Montoya, 2006, p 56). Under this flexible and inclusive perspective it is possible to analyse the different kinds of interpersonal relationships and generate efforts or appropriate ways for them to enrich the teaching-learning process, as well as the results obtained.

Regarding the factors that affect relationships, assertiveness is a concept that has been positioned over time as a source of resources, in the perspective of Castaños, Reyes, Rivera and Díaz (2011) consists of the ability to an individual to transmit to others and to himself his opinions, beliefs or feelings, whether positive or negative; your ability to perform this behaviour in a non-aggressive or passive way; the degree of comfort with the behaviour (anxiety); and the degree to which this behaviour is effective or achieves its purpose (p.56). In a situation of interaction and assertive communication is multidimensional, it

identifies three key aspects: the situational, personal and behavioural, the first refers to the external conditions surrounding the situation, the second are the social actors involved, if the fact arises between equals or with some figure of authority, while the latter includes the attitudes assumed by the interlocutors such as being receptive or on the contrary defensive (Maluenda, Navarro and Varas, 2017).

The definition of what implies to relate in an assertive way reveals the relationship that exists between communication, rights and feelings as factors responsible for articulating everyday social interactions. What happens is that often they are not aware of them and large-scale gaps, separations and conflicts begin to emerge. In the perspective of the Ministry of National Education (2008) "triumph or failure is not a matter of studying more or less: it depends on having the necessary conditions for effective and happy learning. Teachers, parents and even friends play an important role in this process "(page 6). Different researchers have analysed and proven the link between school success and personal motivation, some like Garcia Legazpe (2008) specify its multidimensional nature where affective and cognitive variables come into play, which in their interaction contribute to form the assessment that has the student of himself and his environment.

The fact of recognizing its complexity has generated guidelines and classifications, such as that formulated by Covington (2000) in his self-assessment model, in which he identifies domain-oriented students, where performance and motivation are his main interests, there are also those who avoid failure and therefore do not participate in school life, in addition to those who accept failure, who assume a defeatist attitude and low effort. However, none of these decisions is the result of a homogeneous environment, as explained by Edel (2003) are the particularities in the personality of each student that make up the variety of performance results:

By taking up the motivation factor, as a process by which a behaviour is initiated and directed towards the achievement of a goal, it implies fostering its internal resources, its sense of competence, self-esteem, autonomy and realization (p.13). The aforementioned contribution begins to reveal the need to address academic success according to its different factors and how these are articulated mainly under an emotional logic, the same as Mayne (2001) define with the ability to "mediate the ability to adapt and to respond to a variety of experiences. They prepare the body to respond quickly to threats from the surrounding world. Likewise, social psychologists suggest that human emotions are fundamental for attachment, interaction and social function "(p 16).

Recognizing the role of emotions is presented as an invaluable starting point for this research project because it allows correlating academic performance with a number of factors that are often ignored and that are sometimes thought to have no theoretical / scientific basis. Based on the aspects identified by Dodge and Garber (1991), Rendón (2007) explains the cognitive appreciation he understands in the ability to evaluate situations from the physiological aspects, in terms of physical responses of the body with respect to emotions, in addition to the expression, socialization and modulation of emotions, linked together to externalize the impressions and feelings experienced by people. However, from the classical traditions for example in Ausubel (1991) it is not attitudes, but aptitudes, the greatest predictors of academic success. In the middle term, Bandura (1987) establishes three types of cognitive motives: cognitive representations of the future consequences of behaviour, goal setting and self-regulated reinforcement and proximity of the goal "(as cited in Covarrubias and Mendoza, 2015, p.66), in their theoretical vision are the unidirectional perspective of obtaining a good grade and the emotional aspect that drives the student's performance.

Within the psychosocial field, Murillo (2003) differentiates psychological factors from social

and cultural factors to define in the former the relevance of the space or place of study, the organization of collective and personal time, as well as the study techniques used. As for the second group, it establishes the social class, the climate of coexistence and the family influence.

On the other hand, VOSS et al. (2003) have developed a valid, reliable and generalizable scale to measure the hedonistic and utilitarian dimensions of attitudes with a hedonistic component derived from the sensations provoked by the stimulus to which consumers are exposed, and a utilitarian component results from the more functional aspects associated with this stimulus, as antecedent of the attitude, they use the implication variable, divided into its affective and cognitive components.

All these factors are landed by the MEN (2008) who condenses them into 10 key aspects: high self-esteem, good teachers, more time to study, constant supervision, family and online school, reading as a purpose, having a good library, the environment family and develop productive tasks. As you can see, the Ministry has a vision that integrates different areas and factors, the interesting thing is that in its proposal it is reflected that in the school environment the elements do not stop relating and provide constant feedback over time.

## Method

From the nature of the research, given the characteristics of the object of study and the context where it takes place, together with the methodological perspective adopted to study it, the project is framed in the mixed approach since from the quantitative scope a correlational method follows explains Sierra (1989) "in this case, the researcher constructs a test battery that includes the variables to be studied and that the subjects -or a significant sample of them- have to answer. The subsequent statistical analysis of the data allowed the researcher to obtain certainty of the truth or falsity of his hypothesis "(page 18), from the qualitative field an ethnographic method follows, which approaches the problem of study from three perspectives to the allow to

understand the situations, when considering the point of view of the people involved, by motivating to go to the terrain where the events occur and as a text, describe in a textual way the findings and behaviours (Pérez, 2012). This method will deal with the nature of the problem, the personal experiences of the main actors, their attitudes and practices, as well as the characteristics of the context where it takes place, within which instruments are nestled for a better analysis and interpretation of the results, from a more precise perspective.

The research is holistic when dealing with the scenario and people not reduced to variables, but considered as an integral whole, which obeys a logic of organization of the institution, functioning and meaning to understand the events from the multiple interactions that they characterize and, naturalistic to focus on the internal logic of the reality that analyses, trying to understand people within the frame of reference of themselves. It has a sequential design type with a group of 1140 students. The subjects involved in the research of these groups were assigned through voluntary participation from sixth to eleventh grade of educational institutions in Colombia.

Techniques used in the research come from the application of the instrument 'Interpersonal Reactivity Index' (IRI) of Davis (1980), a self-administered questionnaire that has 28 items and includes 4 sub-scales that allow evaluating different dimensions of empathy. The subject to be evaluated must award a score that ranges from 1 to 5 according to the degree of agreement or disagreement with each statement. The sub-scales it develops are: taking perspective, empathic concern, personal suffering and fantasy and identification (Olivera, Braun and Roussos, 2011, p.124). The second technique corresponds to the design of an interview and the third technique consists of external or non-participant observation. To analyse the results obtained regarding the evaluation of empathy with the application of the Davis Test to 1140 students, a second tabulation was carried out according to the characteristics of this scale according to the distribution of items by subscale: PT =3,8,11,-

15,21,25 y 28; FS = 1,5, -7,-12,16,23, y 26; EC= 2, -4,9,-14,-18,20 Y 22; PD = 6,10,-13,17,-19,24 y 27 the items that are in negative: -3, -4, -7, -12, -13, -14, -15, -18 and -19 are tabulated in inverse, if the answer is 5 the value of 1 is left and thus with the other values: 4 = 2, 3 = 3, 2 = 4 and 1 = 5 (Davis, 1980, p.9).

The Mini-Mental State Examination test (Lobo, et.al., 2001) was also applied, a screening test for cognitive impairment that includes orientation, fixation, attention and calculation, memory, naming, repetition, comprehension, reading, writing and drawing, and its total score provides an index of general cognitive functioning. Meanwhile in the interview, content analysis was carried out through the codification of the information and the establishment of categories of analysis, the triangulation of the findings obtained through the different collection techniques was carried out. Finally, once determined certain factors and main components in order to elaborate a structural model, the model of VOSS et al. (2003) that measures the hedonistic and utilitarian dimensions of attitudes and show that they allow an adjustment superior to that obtained when working with a one-dimensional variable, the emotional cognitive responses are measured directly than to resort to variables related to them, as is the case of the implication. This justification on the presence of the emotional component in communication effectiveness models, together with the consistency of the results obtained in the studies that transfer the Dual Mediation Hypothesis to performance in one or several areas, as well as the correspondence between the type of answers that come to the mind of the student and the dimensions of the attitude toward science and towards an area of knowledge for purposes of research in mathematics.

**Results**

Qualitative analysis shows that the academic success of young people is associated with motivational, psychological or social, cultural factors that condition aspects such as the climate of coexistence, social class and family influence (Table 1). Under this view the student is not an

isolated presence but the sum of different influences that lead him to behave in a certain way and choose certain priorities.

The different factors that have been identified remain related and are expressed on a daily basis, to that extent students are more or less attached to one another, in the opinion of one of them "it is important that people believe in what one promises, that is why it is so important to fulfil "(E-024) and in the eyes of someone else" the academic success I have is the result of different efforts that start with my dad, include the teachers and then I take care of myself to fulfil the achievements "(E-036). This analysis also reflects that good grades or the excellent profile of young people is not due to a single reason and although they answer with indifference about relationships, in reality when they are observed they are careful to take care of their friendships, in not discuss with others and try to expand their network of acquaintances every time they start a new school year.

**Table 1.**

Successful academic life factors

Factor	Characteristics
Familiar	-Admiration -Affectivity -Communication
Social	-Admiration -Leadership -Confidence
Personality	- Self esteem -Determination -Discipline -Indifference
Cultural	-Social class -Responsibility -Motivation - Commitment

Source: Authors

On the other hand, results of the empathy test indicate lower scores are given in items 6 ("in emergency situations, I feel aggressive and uncomfortable"), 24 ("I tend to lose control during emergencies") and 27 ("When I see someone who urgently needs help in an emergency, I fall apart"), where item 6 registered an average of 2.12 that corresponds to the sub-scale of personal suffering, item 24 on the other hand had an average of 2 also of the sub-scale of personal suffering, meanwhile item 27 reached an

average of 2.07, is part of the same scale mentioned previously. While the items with the highest scores were 8 ("I try to take into account each of the parties (opinions) in a disagreement (conflict) before making a decision") and the 18 ("when I see someone who is being treated unfairly, sometimes I do not feel any compassion for him"), since the item 8 registered an average of 4.32 in the sub-scale of taking perspective and for his part the item 18 had an average of 4.15, this is part of the sub-scale empathic concern (Table 2).

**Table 2.**

Average descriptive analysis by item

ITEM	Mean
Perspective shot ITEM 3	2,68
Perspective shot ITEM 8	4,32
Perspective shot ITEM 11	3,95
Perspective shot ITEM -15	2,85
Perspective shot ITEM 21	3,77
Perspective shot ITEM 25	2,90
Perspective shot ITEM 28	3,70
Fantasy and identification ITEM 1	3,67
Fantasy and identification ITEM -5	3,60
Fantasy and identification ITEM -7	2,77
Fantasy and identification ITEM 12	2,32
Fantasy and identification ITEM 16	3,10
Fantasy and identification ITEM 23	3,30
Fantasy and identification ITEM 26	3,35
Empathic concern ITEM 2	3,95
Empathic concern ITEM -4	3,50
Empathic concern ITEM 9	3,60
Empathic concern ITEM -14	3,30
Empathic concern ITEM -18	4,15
Empathic concern ITEM 20	2,97
Personal suffering ITEM 6	2,12
Personal suffering ITEM 10	2,60
Personal suffering ITEM -13	2,30
Personal suffering ITEM 17	2,82
Personal suffering ITEM -19	2,47
Personal suffering ITEM 24	2
Personal suffering ITEM 27	2,07

Source: Authors

Results of the average corresponding to the four sub scales evaluated by the Davis Test show that the highest score is in the empathic concern dimension (24 / high), meanwhile the lowest score was registered in the dimension of personal suffering with 16.4. (Table 3),

**Table 3.**

Statistical frequencies by sub scales

	Statistics			
	PT	FS	EC	PD
Mean	23,9250	18,9250	24,6000	16,4000
Median	24,0000	20,0000	24,0000	15,5000
Mode	23,00	20,00	22,00 <sup>a</sup>	13,00
Deviation	3,56901	4,02803	3,37259	4,19890
Minimum	15,00	11,00	19,00	10,00
Maximum	32,00	27,00	34,00	28,00
Percentiles				
5	18,0500	11,0500	20,0000	10,0500
10	20,0000	12,2000	21,0000	12,1000
15	20,0000	14,1500	21,0000	13,0000
20	21,0000	15,0000	21,2000	13,0000
25	21,0000	16,0000	22,0000	13,0000
30	22,0000	16,3000	22,0000	13,0000
35	23,0000	17,0000	22,3500	14,0000
40	23,0000	18,4000	23,4000	14,0000
45	23,0000	19,4500	24,0000	14,4500
50	24,0000	20,0000	24,0000	15,5000
55	24,5500	20,0000	24,5500	16,0000
60	25,0000	20,6000	25,6000	18,0000
65	25,0000	21,0000	26,0000	18,0000
70	26,0000	21,0000	26,7000	18,0000
75	26,0000	22,0000	27,0000	19,0000
80	27,0000	22,0000	27,0000	20,0000
85	27,8500	23,0000	28,7000	21,0000
90	28,9000	24,0000	29,9000	21,9000
95	30,0000	24,9500	30,0000	25,8500
100	32,0000	27,0000	34,0000	28,0000

Source: Authors

**Table 4.**

Overall results of the empathic disposition

Sub -Scale	Results	Valuation
Perspective shot (PT)	23,9	Normal
Empathic concern (EC)	24,6	High
Personal suffering (PD)	16,4	Normal
Fantasy and identification (FS)	18,9	Normal
Sub categories		
Cognitive empathy	42,9	Normal
Affective empathy	41	Normal
Global category		
Empathetic disposition	83,9	Normal

Source: Authors

In general, the dimensions yielded a normal assessment, only the dimension of empathic concern is located at the high level (Table 4). Regarding the two main subcategories that the instrument establishes: cognitive empathy, formed by the sub-scales of perspective and fantasy, a consistent willingness of the students



has been found to put themselves in the place of the other and to feel identified by the experiences that consume through the media or entertainment. F to the subcategory of affective empathy that involves the sub-scales of concern and suffering reflects a lower disposition to feel uncomfortable or anxious with the bad experiences that their classmates can experience, especially when they observe directly the situations of bullying or conflict. In general terms in the reagents a normality is established in terms of the cognitive empathy of 42.9 and the emotional empathy of 41 of a possible ideal score of 70, revealing a high cognitive and affective category, reason that leads to establishing a normality in the overall measure of empathy with an average score of 83.9 compared to a possible score of 40.

It is evidenced in figure 1, that the similarities are greater than the differences identified among the students object of the test, 1135 of them remain at the normal level in terms of their cognitive and emotional performance in terms of being interested or understanding the experience of the other. We identified the main components associated with the concentration that reach some items in the responses and scores of the young people analysed, the main coincidences revolve around the points: 9 ("when I see that someone is being teased, I tend to protect him"), 12 ("It's weird for me to get completely involved in a good book or movie"), 24 ("I tend to lose control during emergencies"), 25 ("when I'm disgusted with someone, I usually try to put myself in their place a moment ") and 27 (" when I see someone who urgently needs help in an emergency, I fall apart ").

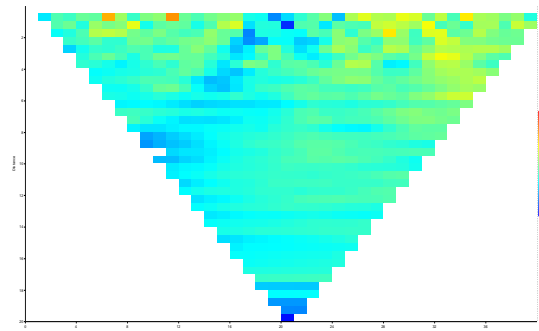


Figure 1. Correlogram. Source: Authors

The correlogram shows a homogeneous group with similar characteristics in terms of the age range as well as in the perception and handling of perspective taking, fantasy, empathic concern and personal discomfort. The differences highlighted in yellow or electric blue refer to the inflections in which students move away from the average, but it occurs rarely and refers mainly to the dimension of fantasy and identification, in which each offers a different perspective when placed individually before the hypothetical situations raised.

When analysing results according to age, it was observed that the scores of all cognitive functions (verbal memory, viso-motor speed, working memory amplitude, semantic and phonological fluency, denomination and general cognitive functioning) experienced a slight statistically significant decrease according to age increases.

The AVLT test provides information on the status of the immediate verbal memory, the delayed and the learning potential, in this, the results show that the average of words remembered by the participant after being read by the evaluator (immediate verbal memory) decreases as age advances in series 1 ( $F_{(2, 1138)} = 112.23, p < .001$ ), series 2 ( $F_{(2, 1138)} = 105.24, p < .001$ ) and series 3 ( $F_{(2, 1138)} = 74.95, p < .001$ ). The same result is found in the extent of delayed verbal memory ( $F_{(2, 1138)} = 94,621, p < .001$ ) and in the learning potential ( $F_{(2, 1138)} = 11,067, p < .001$ ). In the post-hoc comparisons, significant differences were found between all the age groups for these variables. Significant differences were also found between all the groups in attention tasks and processing capacity (viso-motor speed ( $F_{(2, 11138)} = 106.11, p < .001$ ) and memory amplitude ( $F_{(2, 1138)} = 58.90, p < .001$ )) and language (semantic

fluency ( $F(2, 1138) = 72.067, p < .001$ ), phonological fluency ( $F(2, 1138) = 55.20, p < .001$ ) and denomination ( $F(2, 1138) = 58.12, p < .001$ ).

**Table 5.** Averages and typical deviations of cognitive performance variables

Cognitive variables	Age	Age	Age
	16	17	18
Immediate verbal memory series 1	5.54 ± 1.87	4.34 ± 1.81	3.46 ± 1.65
Immediate verbal memory series 2	8.00 ± 2.48	6.75 ± 2.35	5.67 ± 2.20
Immediate verbal memory series 3	9.86 ± 2.84	8.02 ± 2.87	7.05 ± 2.70
Delayed verbal memory	7.98 ± 3.11	6.19 ± 2.92	4.91 ± 2.86
Learning potential	4.32 ± 2.43	3.69 ± 2.40	3.59 ± 2.15
Viso-motor speed	18.91 ± 5.94	15.10 ± 5.70	12.67 ± 5.16
Work memory breadth	6.28 ± 2.71	4.99 ± 2.14	4.39 ± 2.10
Semantic fluidity	20.19 ± 5.32	17.27 ± 4.94	15.74 ± 4.88
Phonological fluency	12.39 ± 5.20	10.01 ± 5.21	7.96 ± 4.96
Denomination	16.39 ± 4.06	13.77 ± 4.98	12.71 ± 4.59
N	538	295	239
Cognitive status	28.73 ± 1.53	28.0 ± 1.88	26.88 ± 3.57

Source: Authors

The 15-year-old group correctly marks more Ps and Ws letters in the cancellation test and remembers more digits series backwards than the groups of 17 and 18 and over. In the same way, the group of 15 years says in a minute more names of animals and more words that begin with the letter "s" than the groups of 16 and 18 years and older. The same pattern is repeated in the denomination task, where the 16-year group obtains higher scores than the groups of 17 years

and 18 and over. Regarding the measure of cognitive status, performed through the Mini-Mental, there were also differences in means between the three statistically significant groups [ $F(2, 1138) = 53.83, p < .001$ ]. The older group scored lower compared to the other two groups.

**Table 6.** Triangulation factors

Davis Test	Interview	Observation	Triangulation
		n	n
The empathic disposition reaches a normality score that dictates a symmetry between the cognitive and emotional aspects that intervene in regulating the social responses of the students, however the test only reflects the intention and there arises the latent difficulty with the personal suffering that the pressure generates in young people not knowing how to respond.	The students respond with interest the questions about their motivation to attend school, however it is not the same when they are questioned about the quality of the interpersonal relationship that they develop in the Institution, in that they are more cautious and superficial in the ideas. Some of them recognize the influence of links, but others give more importance to family or individual aspects.	The observed groups are comfortable in academic life, discipline is an essential aspect in school and is responsible for regulating the behaviour of students. However, several of them are more interested in standing out to obtain a recognition of admiration from the community (parents, teachers and peers).	The factors that affect it range from social, family, cultural and personal, a set of aspects that reveal the complexity of the educational experience and how much it is necessary to consider students as beings that transcend cognitive goals to insert themselves into society contributing to the active construction of better realities.

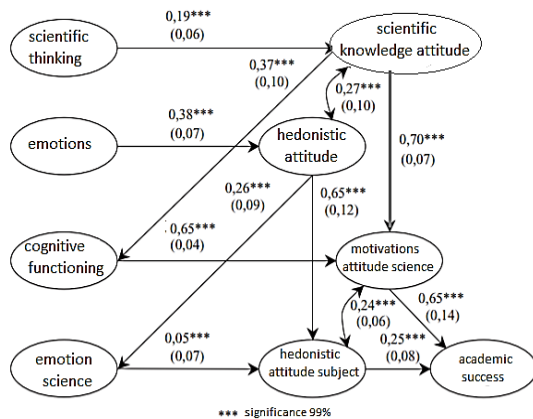
Source: Authors

### Factorial analysis

Two components, explain 89% of the total variance of the set of variables, the first two factorial axes conserve 73.3% of inertia. The

component 1 corresponding to age is responsible for explaining 77% of the cognitive and emotional responses shown by the students. The model establishes that a first axis was defined by variables associated with cognitive functioning of the individual, in which, age (ED) with a variability ratio explained by individual of 0.74, verbal memory, learning potential, visual motor speed, breadth of working memory, semantic fluency, cognitive status; and the second factor associated with cognitive and emotional responses to knowing, attitude toward the areas of scientific knowledge influences both directly and indirectly, through the thoughts related to science, on the attitude towards the science or subject that it studies. In addition, it confirms one of the relationships studied in the field, which is established between the attitude toward the subject and the attitude toward the study of science (Figure 1).

**Structural model**



**Figure 2.** Structural model

The findings defined in terms of factors that affect academic life (table) indicates that the more favourable is the processing that occurs in the mind of the student with respect to science and its application, the more favourable is the instrumental component towards the scientific knowledge towards it ( $\gamma = 0.19$ ,  $SE = 0.06$ ). Faced with emotions, this direct effect is confirmed ( $\gamma = 0.38$ ,  $SE = 0.07$ ), which can be deduced that the net emotional responses experienced by the student have a positive effect on the sensory dimension of the attitude towards the learning in search of a goal and better performance.

Cognitive functioning has a direct and positive effect on the utilitarian or instrumental dimension of motivation and attitude towards sciences or areas of better academic performance ( $\beta = 0.65$ ,  $S.E. = 0.04$ ). However, there is no significant relationship between the net emotions generated by science and the hedonistic dimension of the attitude towards success ( $\beta = 0.05$ ,  $S.E. = 0.07$ ). The utilitarian dimension of the attitude toward scientific thinking positively influences cognitive function ( $\beta = 0.37$ ,  $SE = 0.10$ ), while, at the same time, the hedonistic dimension of the attitude toward the website has a positive effect on the net emotions aroused by the sciences and their application in the mind of the young student ( $\beta = 0.26$ ,  $SE = 0.09$ ).

It is confirmed that the more favourable is the utilitarian dimension of the attitude toward scientific thought, the more favourable is also the utilitarian dimension of the attitude toward motivation by the sciences ( $\beta = 0.7$ ,  $S.E. = 0.07$ ). On the other hand, the more favourable the hedonistic dimension of the attitude, the more favourable is the hedonistic dimension of the attitude towards the subject under study ( $\beta = 0.65$ ,  $S.E. = 0.12$ ). That is to say, there is a direct transfer through the so-called peripheral route (PETTY and CACCIPO, 1981) from the attitude toward the vehicle of scientific thought, to the attitude towards the subject, according to the components that we have been differentiating. Finally, regarding the correlation between the utilitarian and hedonistic dimensions of the attitude, significant coefficients are obtained for motivation attitude by science ( $\psi = 0.27$ ,  $SE = 0.10$ ) as for attitude and results in the subject ( $\psi = 0.24$ ,  $SE = 0.06$ ). Therefore, the model contemplates related components. The global adjustment of the structural model reaches acceptable levels in the relevant statistics with correlations ( $\chi^2 = 222.48$   $p = 0$ ,  $gl = 145$ ,  $GFI = 0.86$ ,  $RMSEA = 0.06$ ,  $SRMR = 0.10$ ,  $CFI = 0.97$ ;  $NNFI = 0.97$ ).

**Discussion**

In social psychology authors such as Mattelart (2003), heir to a long tradition of theorists including Doob and Allport, consider that attitude is responsible for driving behaviour, in

some cases relationships of congruence are established, while in others considerable differences are identified regarding what someone believes and what they end up doing once they are immersed in a certain social situation. In that order of ideas in the analysis of results of the Davis empathy test, two key clusters were defined, one comprising items 10, 17, 20, 24 and 27, being one of the most significant groups when grouping 5 points that it makes reference mainly to the dimension of personal suffering and only one of them is part of the empathic concern, in this case stand out statements such as "when I am in an emotionally tense situation I get scared" (item 17) or "when I see someone who needs urgently help in an emergency, I fall apart" (item 27). The other cluster or conglomerate was made up of items 2, 8, 11, 21, 4 and 13 that belong to the dimensions of empathic concern, perspective and, to a lesser extent, personal suffering, in which statements such as "I often have tender feelings and concern for people less fortunate than me" (item 2)," I often try to understand my friends by imagining how they see things (putting me in their place)" (item 11) and "I think that there are two parts for each question and I try to take both into account" (item 21).

In the composition of the conglomerates two predominant attitudes were determined, the first reveals how empathic concern can be a source of tension and suffering for students, who describe that when they see their classmates affected by some conflict or problem, they become uncomfortable and do not know how to respond. The second focuses on taking perspective, that is to say, the student believes that he can remain neutral in the middle of the discussions or confrontations and stop to take into account the personal opinions of his school partners.

The two dimensions that stand out dictate to a great extent the behaviours shown by the students, who in the interviews share mixed positions since a part of them has not felt cheated or excluded, while others do stand out among their comments that "they mess with me when I remind the teachers of the task or the exam" (E-003), they also highlight that "one receives reproaches when something does not go well and gets a bad grade" (E-021).

In general, according to García Legazpe (2008), school success has a multidimensional nature in which cognitive and emotional elements participate, in this sense students conform their disposition and behaviour according to their

acceptance of the academic environment. Faced with this it is observed that students have doubts since students with a normal or deficient performance are those who tend to feel more comfortable in school, while those who have an excellent performance are those who are more critical about how they should edit his personality and behaviours in order to please, in that perspective they point out that "we are indifferent to negative comments or congratulations, we focus on learning more and more" (E-008).

In the observations made it is often noted that they are people with few friends, several of them are shy, although competent to participate in the extra activities of the committees, some are reluctant to meet new people because they do not want to be used for their skills or knowledge. In that order of ideas, some comments were received in which they say "I am not interested in treating those who call me a fool for complying with the rules and being disciplined" (E-013). The notes in the cards show a significant resistance on the part of the high performance students to try to form new bonds and relationships, on the other hand those who have problems with the grades are the most expressive and tend to have more friends during the rest time in the backyard. Another of the behaviours that can be seen in coexistence is the superiority or self-centeredness with which students can respond when bothered by their peers, in this line they express that "I like to know more than others and always understand what is happening" (E-021).

The responsibility for their good performance also generates a social pressure in which their difficulties in some areas such as physical or artistic education stimulates negative comments in the other students of the group, when they are judged they show themselves withdrawn, they close each time more to his closest social circle, formed by one or two friends and increases one of his characteristic behaviours, the achiever and stable, since they do not like the changes and reflect great distrust. The oscillation between the outstanding dimensions of suffering and perspective reveals among other things that children and young people are at a crucial stage to form their social personality, in that sense, although their basic impulses instigate them to care or help, they do not know how to leave to be overwhelmed and choose not to risk, feign disinterest or simple indifference to the subject of interpersonal relationships.

In the contributions of Castanyer (2010) prevail the concepts of self-esteem and confidence, two of the weaknesses found in the students object of study, because in them it is uncommon to see that they take positions to express their dissatisfaction with the attitudes or behaviour of their partners, this situation leads them to respond in a superficial way to the questions about their experiences of coexistence and compromises their assertiveness because most of them find it difficult to clearly define their social expectations. In the perspective of a ninth grade student "I enjoy coming to school because I become a better person who can become someone in life" (E-018), in the ideas and answers given by young people it is evident that Interpersonal relationships are the basis of their decisions, even to feel more confident in themselves, a circumstance that generates risk because as mentioned reduces assertiveness and leads to a state of indifference that reduces their ability to express their voice and criteria.

Personal pride is then presented as another of the factors highlighted in this context since students want to feel qualified by the community as intelligent and duty-bound people, as described by a student who stated that "even when we have problems we try to be respectful, because in that way we do not affect the coexistence" (E-037). The link between individuality and the group always remains latent in the ideas, attitudes and behaviours of the students analysed, an essential aspect to understand why you make the decisions and choose the daily actions.

In the works of Tomás, Expósito and Sampere (2014) academic performance is described as a broad group of factors that greatly exceed the intellectual aptitudes, which arise through the interrelation between the internal and external reality of the apprentice. In the current notions the role of emotions and perceptions that are formed through the experiences that occur in the classroom or outside it are valued, to that extent the students of the Sacred Heart of Jesus IE reveal in their dynamics of coexistence and learning different sources of stimulus or response that affect their ways of situating themselves in school life.

One student points out that "the best results I get the most sociable I can be" (E-026), while the other highlights "my grades make me feel important and I do not know if the classmates approach me because of that" (E-039), with this we want to highlight the variety of experiences that exist within the same Institution and how the

factors may be common, but with different intensities depending on each person. The Ministry of National Education (2008) has defined a series of aspects that are essential for the educational environment, among which are self-esteem, teachers, family, resources, discipline and tasks. In general, with the observations made, it has been confirmed that all of them are present among the high school students taken as reference for analysis, however, what is most repeated is the vocation for external admiration, the students want to be valued by the community due to their results and qualifications, leaving in the background the quality and substance of the interpersonal relationships they establish.

In the results of the Test applied around the levels of empathy, two subcategories are prioritized, in which cognitive empathy is called a normal reach and the same with the affective empathy, however, what was found in the interviews and the observations is that most have assumed behaviours of distrust or indifference. Faced with this incongruity that is reflected between attitude and action, the empathic disposition is affected, an effort that students fail to achieve because they are more concerned with themselves than with others. In the perspective of Murillo (2003) there are not only psychological or social factors, there are also the cultural factors that condition aspects such as the climate of coexistence, social class and family influence. Under this view the student is not an isolated presence but the sum of different influences that lead him to behave in a certain way and choose certain priorities. Likewise, according to the process of advanced observation, it is evident that the students are interested and concerned about their own or others' problems of coexistence, and to that extent, in the interviews, opinions were heard such as "I do not like to see other people mistreated Companion so be raising the voice" (E-012), in this way the sensitivity and empathy shown by the learners with higher performance also offers them the tools to respond to conflict situations.

## Conclusions

The attitudes and behaviours evidenced in students with excellent academic performance regarding their interpersonal relationships are positive with respect to how they present them, although if they must withstand the pressure and criticism of the environment, this means that they have the perceptions and tools to manage the conflicts that arise due to the jealousy, complexes

or ridicule that your other colleagues sometimes generate.

The research identifies that while the multidimensional empathy shown by learners helps them to be more tolerant and understanding of what happens in the school environment, it is sometimes external behaviours that take them away from their focus, values and personality. It is precisely in those challenges that show the strengths that bring them high educational performance. The scores of the cognitive functions (verbal memory, viso-motor speed, working memory amplitude, semantic and phonological fluency, denomination and general cognitive functioning) experience a statistically significant decrease with increasing age.

The main factors that affect the academic and social life of the students analysed are the family expectations and the pressures of the community of the Educational Institution, in this sense making parents feel proud is one of their main motivations for having an irreproachable behaviour in the classroom and outside of it, while the demands of the school are another factor that drives them to maintain their level of performance.

To a lesser extent, but also with value, are the cultural characteristics of the neighbourhood and the city in which interpersonal relationships can lead to screaming or aggression, these behaviours influence the vision of the students, but the school rules they help to contain and control their reactions. In the correlations between the academic success and the students' abilities to solve social conflicts, it is evident that the dimensions that work as support for the management of the difficulties are those of taking perspective and empathic concern, both as observed and measured. They remain in feedback which allows them to be a support for the learners, who first notice the sadness or affectation that the situation generates, be it personal or of someone else in the group and then tend to perform the exercise of putting themselves in the place of the other.

In general, the social pressure to maintain their performance is not a sufficient reason to affect the empathy and tranquillity in the coexistence experienced by high school students at the Sagrado Corazon de Jesus School, however they are presented as challenges that put self-esteem to the test and the integrity of the students, which is why the Institution needs to pay more attention to this topic in order to generate the

accompaniment that is necessary according to the conditions of each one.

The relative importance of each of the components provides clues about the convenience of the teacher to introduce emotional or cognitive stimuli in the teaching process to achieve successful students, so that the message they want to convey to their target audience actually arrives.

The successful student attaches more importance and, consequently, pays more attention to the emotional component in his learning process.

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