**Recibido:** 2 Sep., 2021 | **Aceptado:** 21 Jun., 2022 | **Publicado:** 23 Jun., 2022

# IQ and academic performance in a group of first emester psychology students

IQ and academic performance in a group of first semester psychology students

QI e desempenho académico num grupo de licenciados em psicologia do primeiro semestre



*DOI: https://doi.org/10.21803/penamer.15.29.456*

**Álvaro Alejandro Acosta Echavarría.**
https://orcid.org/0000-0003-3185-6824
Psicólogo, Magister en Neuropsicología. Profesor investigador del programa de Psicología de la facultad de Ciencias Humanas y Sociales de la Corporación Universitaria Minuto de Dios UNMINUTO, Rectoría Antioquia Choco Seccional Bello. aacostaecha@uniminuto.edu.co.

**Wilber Arduai Mejía Toro**
https://orcid.org/0000-0003-1921-0916
Psicólogo, Magister en Epidemiologia y Doctorante en Ciencias de la Educación. Profesor e investigador del grupo GIBPSICOS de la facultad de Ciencias Sociales de la Universidad Católica De Oriente-Colombia. wmejia@uco.edu.co,.

**Ana María González Uribe**
https://orcid.org/0000-0002-6659-1793
Psicóloga, magister en Neuropsicología, Antonio Jose de Sucre, Corporacion Universitaria. ana_mariagon@hotmail.com.

**Resumen**

**Introducción:** El Coeficiente Intelectual (CI) bajo, se ha asociado con dificultades en diferentes ámbitos de la vida, entre ellos el rendimiento académico. Esta asociación suele no ser detectada hasta etapas tardías y puede presentarse en estudiantes universitarios. **Objetivo:** Este estudio buscó determinar la fuerza de asociación entre el CI y el rendimiento académico en un grupo de estudiantes de primer semestre, del programa de psicología de una universidad privada en el departamento de Sucre Colombia. **Materiales y Método:** se realizó una investigación de tipo correlacional, transversal, con una muestra no probabilística compuesta por 114 estudiantes. El CI se evaluó con la prueba WAIS-IV y se analizó su correlación (rho de Spearman) con las calificaciones de los estudiantes en las diferentes asignaturas cursadas en el semestre de 2018-I. Resultados: Se encontró que el 39% de los estudiantes se ubica en el rango de inteligencia limítrofe y el 1% en el rango de discapacidad intelectual. Pudo apreciarse una correlación positiva baja (p≤.05) entre el CI y cuatro de las seis asignaturas cursadas, así como con el promedio académico global de los estudiantes. **Conclusión:** Los bajos resultados obedecen a aspectos culturales y no a la prevalencia de un detrimento intelectual. Lo anterior confirma la necesidad de implementar medidas con escalas adaptadas y programas de educación congruentes desde lo cultural para este tipo de población en las instituciones de educación superior del país.

***Palabras clave:*** Coeficiente Intelectual; Rendimiento Académico; Educación superior.

**Abstract**

**Introduction:** Low IQ has been associated with difficulties in different areas of life, including academic performance. This association is usually not detected until later stages and may be present in university students. **Objective:** This study sought to determine the strength of the association between IQ and academic performance in a group of first semester students in the psychology program of a private university in the department of Sucre, Colombia. **Materials and Methods:** A cross-sectional, correlational research was carried out with a non-probabilistic sample of 114 students. IQ was evaluated with the WAIS-IV test and its correlation (Spearman's rho) was analyzed with the students' grades in the different subjects taken in the 2018-I semester. Results: 39% of the students were found to be in the borderline intelligence range and 1% in the intellectual disability range. A low positive correlation (p≤.05) could be appreciated between IQ and four of the six subjects taken, as well as with the overall academic average of the students. **Conclusion:** The low results are due to cultural aspects and not to the prevalence of intellectual impairment. This confirms the need to implement measures with adapted scales and culturally congruent educational programs for this type of population in the country's higher education institutions.

***Keywords:*** IQ; Academic Performance; Higher Education.

**¿Cómo citar este artículo?**
Acosta, A., Mejía, W. & González, A. (2022). Coeficiente intelectual y rendimiento académico en un grupo de estudiantes de primer semestre de Psicología. *Pensamiento Americano, e#:456. 15*(29), 153-167. DOI: https://doi.org/10.21803/penamer.15.29.456.

**Resumo**

**Introdução:** O baixo QI tem sido associado a dificuldades em diferentes áreas da vida, incluindo o desempenho académico. Esta associação só é frequentemente detectada mais tarde na vida e pode estar presente em estudantes universitários. **Objectivo:** Este estudo procurou determinar a força da associação entre o QI e o desempenho académico num grupo de estudantes do primeiro semestre do programa de psicologia de uma universidade privada no departamento de Sucre, Colômbia. **Materiais e Métodos:** foi realizado um estudo de investigação transversal e correlacional com uma amostra não-probabilística de 114 estudantes. O QI foi avaliado com o teste WAIS-IV e a sua correlação foi analisada (Spearman's rho) com as notas dos estudantes nas diferentes disciplinas tiradas no semestre de 2018-I. **Resultados:** Verificou-se que 39% dos estudantes se encontravam na faixa de fronteira da inteligência e 1% na faixa da deficiência intelectual. Uma correlação positiva baixa ($p \leq .05$) pode ser vista entre o QI e quatro das seis disciplinas tomadas, bem como com a média geral de aproveitamento dos estudantes. **Conclusão:** Os baixos resultados devem-se a aspectos culturais e não à prevalência da deficiência intelectual. Isto confirma a necessidade de implementar medidas com escalas adaptadas e programas de educação culturalmente congruentes para este tipo de população nas instituições de ensino superior do país.

***Palavras-chave:*** QI; Desempenho Académico; Ensino Superior.

# INTRODUCCIÓN

Intelligence according to Wechsler cited by Amador and Forns (2019), is the global capacity of the individual to proceed in an intentional, rational and effective way according to the environment. In an attempt to establish how intelligent a person is, intelligence tests emerged. One of the first intelligence tests was the Standford-Binet scale created in 1905. About 30 years later, the Wechsler Scales, currently approved by the APA (2014), emerged due to their high validity and reliability. To measure intelligence, the Wechsler Scales use the Intelligence Quotient (IQ), which is a ratio between the score a subject obtains in an intelligence test and the score that an average individual of the same age can be assumed to obtain in the same test (Wechsler, 1939). Low scores on these tests (IQ < 70) are associated with neurodevelopmental disorders, such as intellectual disability (ID) and borderline intelligence (LI) (Amador and Forns, 2019; Muchiut et al., 2021; Pluck et al., 2021).

Intellectual disability is associated with difficulty in general mental abilities, but also with difficulties in reasoning, problem solving, planning, abstract reasoning, judgment and learning (Navas et al., 2008). Similarly, people with this deficit present difficulties in their adaptive functioning, which affects their independence and social responsibility in several aspects of their day-to-day life, such as communication, socialization, and academic or work performance (APA, 2014). Currently, ID has become a social problem that, according to data from the World Bank WB, cited by Miranda-Galarza (2021), more than 50 million people with disabilities live in Latin America and the Caribbean.

According to the DSM-V (APA, 2014), three criteria must be met for the diagnosis of ID. The first consists of presenting an impairment in intellectual functions (IQ < 70), which is determined by a clinical evaluation and a standardized intelligence test applied individually (e.g., Wechsler Scales). The second criterion involves adaptive difficulties in one or more activities of daily living, causing a decrease in personal autonomy and social responsibility evident in multiple settings such as home, school or work, which can be assessed through adaptive scales (e.g., Vineland Scale). Finally, intellectual disability is confirmed when both of the above criteria have become evident before the age of 18.

Según el DSM-V (APA, 2014), deben cumplirse tres criterios para el diagnóstico de DI. El primero consiste en presentar un deterioro de las funciones intelectuales (CI < 70), que se determina mediante una evaluación clínica y una prueba de inteligencia estandarizada aplicada individualmente (por ejemplo, las escalas de Wechsler). El segundo criterio implica dificultades adaptativas en una o más actividades de la vida diaria, provocando una disminución de la autonomía personal y de la responsabilidad social evidente en múltiples entornos como el hogar, la escuela o el trabajo, que puede evaluarse mediante escalas adaptativas (por ejemplo, la Escala de Vineland). Por último, la discapacidad intelectual se confirma cuando los dos criterios anteriores se han hecho evidentes antes de los 18 años.

In the social domain, an immaturity in social relationships is established, which is evident from difficulties in communication, the ability to perceive social signals and regulate emotions (Medina and Pérez, 2016). Finally, in the practical domain, difficulties are evident in the ability to make decisions associated with personal well-being and health, as well as in the organization of leisure and compliance with rules (Lazcano and Madariaga, 2018).

According to the DSM-V (APA, 2014), the causes of intellectual disability can be grouped into six aspects: heredity, early embryonic developmental disorders, environmental influences, other mental disorders, prena-

tal and perinatal problems, and finally, medical illnesses suffered during childhood (Márquez-González et al., 2013; Tirado et al., 2015). It is assured that, in most cases of intellectual disability, the causes are unknown; but when it is not associated with a biological factor it is usually mild, and occurs more frequently in people who are part of lower socioeconomic classes. This has been corroborated by other studies, which state that 75% of the cases are due to cultural factors such as low parental intelligence, education received in poor cultural environments and poor hygiene conditions (Ardila et al., 2005).

On the other hand, there are subjects who do not have an IQ low enough to be diagnosed as an intellectual disability, nor high enough to be considered normal, these subjects are located one standard deviation below the mean, that is, they have an IQ between 70 and 85 and are called patients with borderline intelligence (Frontera and Gómez, 2013). Thus, for Salvador-Carulla et al. (2013), IL (borderline) is defined as "the barrier that separates 'normal' intellectual functioning from intellectual disability (IQ between 71-85)" (p. 33).

En línea con lo anterior, esta clasificación, cuenta con criterios diagnósticos poco claros, pero se sabe que e In line with the above, this classification has unclear diagnostic criteria, but it is known to be associated with learning difficulties, cognitive processing failures, low academic performance and, therefore, school failure (Flórez et al., 2016). What is really worrying are the high rates of this condition in the world population since it is stipulated that 13.6% present it (Martínez-Leal et al., 2011). At the Latin American level, in university students in Arequipa, Peru, it was found that about 10% suffer from ID and 28% from IL (Arias, 2014). Meanwhile, in the national context, a study conducted in the city of Medellin (Colombia) found that about 20% of children between six and eight years of age have IL (Zapata-Zabala et al., 2012).

It is associated with learning difficulties, cognitive processing failures, poor academic performance and, therefore, school failure (Flórez et al., 2016). What is really worrying are the high rates of this condition in the world population since it is stipulated that 13.6% present it (Martínez-Leal et al., 2011). At the Latin American level, in university students in Arequipa, Peru, it was found that about 10% suffer from ID and 28% from IL (Arias, 2014). Meanwhile, in the national context, a study conducted in the city of Medellin (Colombia) found that about 20% of children between six and eight years of age have IL (Zapata-Zabala et al., 2012).

In a study conducted in Bogota, Colombia, it was found that 92.53% of people with borderline intelligence resided in low socioeconomic strata (Atuesta & Vasquez, 2009), suggesting that, as in the case of DI, family financial resources may be a triggering factor for IL. Likewise, other authors have found that pedagogical opportunities and the family environment may be other important factors in explaining IL, suggesting that it may be an educational or social problem (Salvador-Carulla, 2013).

The school limitations of IL include difficulties in academic skills such as reading, writing and arithmetic, as well as cognitive difficulties at the verbal, reasoning and attention levels (Salvador-Carulla et al., 2013), which result in a greater possibility of presenting disorders such as dyslalia, dyslexia, dysgraphia and dyscalculia. Likewise, IL has been associated with low resistance to fatigue, difficulties in spatiotemporal orientation and poor academic performance that usually causes a curricular gap of two or three academic years. In fact, the lower the IQ, the greater the difficulties in academic performance, learning, cognitive processing failures and school failure (Flórez et al., 2016).

Difficulties in academic performance affect the professional self-realization of students and the level of knowledge and skills acquired, which later becomes a limiting factor for the demands of the labor market, and also increases school failure and dropout (López et al., 2015). School failure in this population is a significant

problem, since 63% of subjects with IL do not complete high school and most perceive dissatisfaction in the school environment (Ruiz-Ramírez et al., 2014).

In the national context, these school limitations can be evidenced in the measurements carried out by the Colombian Institute for the Evaluation of Education (ICFES) through state tests such as Saber 11 and Saber Pro. It has been found that the results of these tests have a significant relationship with the level of general intelligence and socioeconomic stratum, with students with higher IQ and higher socioeconomic stratum obtaining higher scores (Bahamón and Reyes, 2014); Thus, it is evident that this problem is not foreign to higher education institutions in the country.

In the institution where the study was conducted, there is concern about the academic performance of students, both in the program's subjects and in the state tests controlled by the ICFES. The entrance profile of the students of the program in the Saber 11 tests, in the last four years, indicates that 59% of the students present difficulties in the Critical Reading Competence, being located in levels one and two, which indicates that the students understand continuous and discontinuous texts in a literal manner; but they do not manage to infer implicit contents, nor recognize structures, discursive strategies and value judgments. Similarly, these students present difficulties in the Quantitative Reasoning Competency, where 76% are located in levels one and two, which can be interpreted as that students are able to read information in a timely manner from tables or graphs, make comparisons and establish relationships between data, but they are not able to select information, point out errors or make different types of transformations and simple arithmetic and algebraic manipulations.

On the other hand, in the first semester of 2018, students recently admitted to the program presented significant problems of academic performance, since 17% of the population failed three or more subjects during the first academic period, and 40% of the students maintained this difficulty during the second period. This problem has led the Psychology program to present one of the highest dropout rates in the institution.

The aforementioned makes it necessary to identify the level at which the IQ of first semester students of the Psychology Program is located, as well as to determine the relationship that this has with academic performance. This is important to establish if the intellectual capacity is one of the factors that is affecting the academic performance of the students recently linked to this institution. From this, it will be possible to define if there is a need to implement strategies that facilitate the adaptation of these students to the university context. In countries such as Spain, Australia, the United States and Mexico, there are already inclusion programs for students with intellectual disabilities within universities, based on which it is assured that people who have taken part in these programs have improved academic, personal and social skills (Cerrillo et al., 2013; Pérez-Castro, 2019).

## OBJECTIVES

To determine the strength of the association between IQ and academic performance in a group of first semester students of the psychology program of a private university in the department of Sucre, Colombia.

## METHODOLOGY

### Design

A quantitative, observational study with correlational and cross-sectional scope was conducted (Hernández et al., 2010). Whose objective was to determine the strength of association between IQ and academic performan-

ce in a group of first semester students of the psychology program of a private university in the department of Sucre Colombia in 2018.

### Participants

The sample, which considered a margin of error of 5%, a confidence level of 95%, a response distribution of 50% and an N = 148, was made up of 114 students enrolled in the first semester of the Psychology program at a private university in the department of Sucre. This corresponds to 77% of the total population. The 87.7% of the participants were female, the average age of the group in general was 19.5 years. The sample was distributed in four groups of which three belonged to the daytime (85.1%). In relation to the socioeconomic stratum, 64% of the participants came from stratum one, 25.4% from stratum two and the remaining 10.6% belonged to strata three, four and six.

### Instruments

The Mexican version of the Wechsler Adult Intelligence Scale WAIS-IV (Wechsler, 2012) was used to measure IQ. This is a psychometric evaluation instrument of individual application used for the assessment of IQ in subjects between 16 and 90 years of age. This instrument is recommended by the APA (2012) to measure IQ, as it is considered the most reliable and has adequate validity. Similarly, this instrument has been widely used in the Colombian population (Díaz et al., 2012; Sierra et al., 2015).

The WAIS-IV contains 15 subtests of which 10 are main and five are optional. The main tests must be applied in all cases, and the optional ones are applied when the individual has performed poorly and this score wants to be corroborated. The subtests are grouped into four composite indices: Verbal Comprehension, Perceptual Reasoning, Working Memory, and Processing Speed. The Similarity, Vocabulary and Information subtests are central to the Verbal Comprehension Index, while Comprehension is an optional subtest. This index measures "verbal knowledge and comprehension gained through both formal and informal education that reflects the application of verbal skills to novel situations" (Sattler, 2010, p. 499).

For the evaluation of academic performance, the final grades obtained by students in the first academic semester in the subjects of Biology, Fundamentals of Computer Science, Introduction to Psychology, Anthropology, Study Techniques and Mathematical Logic were taken from the institutional platform. Likewise, the general average obtained according to the number of credits of each subject was taken into account. This was previously authorized by the participants.

### Procedure

Initially, a meeting was held with the students who were part of the study population, where the objectives of the research and the study procedure were socialized. The students who decided to participate voluntarily in the study signed the informed consents at this meeting and from this the research sample was formed.

### Data analysis

The participants were individually summoned for the application of the instrument, which was carried out in the afternoon, in the Gesell Chamber, at a temperature of 22°C and with constant artificial light. Each application of the test lasted approximately 60 minutes. The test was applied by six students from the last se-

mesters of the psychology program, who were duly trained by a professional psychologist expert in the test. The training lasted three weeks and included the pilot application of the test to 10 participants who were not part of the study population. Once the data were collected, the scoring of each of the intelligence tests was carried out according to the instructions in the manual.

### Data analysis

Once all the information was collected, a database was constructed in Excel, and this information was exported to the SPSS statistical program, version 19.0, where the data analysis was performed. Initially, a descriptive analysis of the variables was performed and Kolmogorov-Smirnov normality tests were applied, from which it was identified that there was no normal distribution in the variables to be analyzed. Based on this, bivariate correlations were run between IQ (total and by subtest) and academic performance (overall average and by subject), for this purpose Spearman's correlation coefficient (1961) was used, with bivariate analysis and an alpha of .05 (Martínez et al., 2009).

### Ethical Considerations

Due to the type of observational study carried out, it was considered that it did not represent a risk to the integrity of the participants, since no interventions of any kind were made, and no personal data were requested, thus guaranteeing the privacy of those evaluated. In addition to the above, informed consent was considered, in which it was made clear to the population the possibility of choosing whether or not they wanted to participate in the study, and/or to withdraw at any time they wished. Previously, the nature of the research, the instrument to be used and the general purpose of the study were explained to them. On the other hand, the absence of conflicts of interest on the part of the researchers is highlighted and it is guaranteed that the data were taken from primary sources, and not from another study or other publications (American Psychological Association, 1953; Ferrero, 2007).

### Results

**Tabla 1.**
*Índices Compuestos de la Prueba WAIS IV y CI Total*

| Variable | N | Mínimo | Máximo | Media | DE | Prueba Normalidad |
|---|---|---|---|---|---|---|
| Comprensión Verbal | **114** | **65** | **102** | **81.52** | **5.68** | **.009** |
| Razonamiento Perceptual | **114** | **59** | **109** | **80.54** | **9** | **.000** |
| Memoria de Trabajo | **114** | **62** | **107** | **82.51** | **8.55** | **.004** |
| Velocidad de Procesamiento | **114** | **77** | **110** | **90.51** | **7.56** | **.000** |
| Coeficiente Intelectual Total | **114** | **69** | **105** | **81.21** | **5.24** | **.000** |

Nota. Ninguno de los estudiantes obtuvo puntuaciones ubicadas en rangos altos o superiores.
Fuente: Elaboración propia

Table 1 shows the descriptive statistics of the composite indices and the total IQ of the WAIS-IV test, applied to the first semester students of the psychology program. As can be seen, both the mean total IQ of the students and the average score obtained in the composite indices (with the exception of speed of

processing), ranges between 80 and 83, which corresponds to a low average. Regarding the average of the Processing Speed index, it can be seen that it is located at a normal level. Likewise, as indicated by the standard deviation of the Working Memory index, an important group of students achieved a normal score in the Working Memory index; however, as indicated by the maximum scores presented, none of the students obtained scores located in high or higher ranges, while, except for the Processing Speed index, the minimum scores obtained by the students are located in the extremely low range.

**Tabla 2.**
*Porcentaje y Número de Estudiantes por Rango en Índices Compuestos y CI Total*

| Nivel | Comprensión Verbal | Razonamiento Perceptual | Memoria de Trabajo | Velocidad de Procesamiento | Coeficiente Intelectual Total |
|---|---|---|---|---|---|
| Extremadamente Bajo | **2% (2)** | **7% (8)** | **4% (5)** | **0% (0)** | **1% (1)** |
| Limítrofe | **29% (33)** | **53% (60)** | **37% (42)** | **4% (4)** | **39% (45)** |
| Promedio Bajo | **64% (73)** | **28% (32)** | **46% (52)** | **49% (56)** | **54% (62)** |
| Normal | **5% (6)** | **12% (14)** | **13% (15)** | **47% (54)** | **5% (6)** |
| Promedio Alto | **0% (0)** | **0% (0)** | **0% (0)** | **0% (0)** | **0% (0)** |
| Superior | **0% (0)** | **0% (0)** | **0% (0)** | **0% (0)** | **0% (0)** |
| Muy Superior | **0% (0)** | **0% (0)** | **0% (0)** | **0% (0)** | **0% (0)** |

*Nota.* Ninguno de los estudiantes presentó puntuaciones altas o superiores a excepción del índice de razonamiento perceptual.
*Fuente:* Elaboración propia.

Table 2 shows another perspective of the data, which refers to the number and percentage of students who fall into each of the ranges established for the WAIS-IV test. It can be seen that none of the students presented high or superior scores, and with the exception of the perceptual reasoning index, most of the students were located in the low average range. In parallel, a significant group of students obtained scores that fall in the borderline category and a few had extremely low or normal performance. An exception is the Processing Speed index, in which an important part of the population is located in the normal level (47%).

**Tabla 3.**
*Estadísticos Descriptivos de Rendimiento Académico por Asignatura*

| Asignatura | *N* | Mínimo | Máximo | Media | *DE* |
|---|---|---|---|---|---|
| Biología y Ambiente | **114** | **1.3** | **4.3** | **3.25** | **.39** |
| Fundamentos de Informática | **114** | **1.1** | **4.7** | **3.59** | **.60** |
| Introducción a la Psicología | **114** | **0.7** | **4.8** | **3.66** | **.55** |
| Antropología | **114** | **1.6** | **4.7** | **3.63** | **.50** |
| Técnicas de Estudio | **114** | **1.5** | **4.7** | **3.35** | **.53** |
| Lógica Matemática | **114** | **1.2** | **4.4** | **3.10** | **.51** |
| **Promedio** | **114** | **1.3** | **4.4** | **3.43** | **.41** |

*Nota.* Ningún estudiante se acerca al promedio de 4.0 y las de mayor rendimiento son las asignaturas de humanidades.
*Fuente:* Elaboración propia.

Regarding the academic performance shown in Table 3, it should be previously considered that the grades in this context are evaluated on a scale of .0 to 5.0; 3.0 being the minimum grade to pass the course. By virtue of this, it can be seen that none of them even comes close to 4.0; however, neither do they show a performance below 3.0, an important aspect is that the subjects with the highest performance are those directly linked to the humanities.

**Tabla 4.**
*Coeficiente de correlación entre los índices compuestos y el CI total de la prueba WAIS-IV y el rendimiento académico de los estudiantes en el promedio general y las diferentes asignaturas.*

| Asignatura | Comprensión verbal | Razonamiento perceptual | Memoria de trabajo | Velocidad de procesamiento | Coeficiente intelectual total |
|---|---|---|---|---|---|
| Biología y Ambiente | **.326**** | **.239*** | **.12** | **.137** | **.318**** |
| Fundamentos de Informática | **.078** | **.104** | **-.004** | **.077** | **.119** |
| Introducción a la Psicología | **.0229*** | **.149** | **.058** | **.133** | **.208*** |
| Antropología | **.156** | **.071** | **.041** | **.055** | **.111** |
| Técnicas de Estudio | **.324**** | **.341**** | **.11** | **.148** | **.355**** |
| Lógica Matemática | **.248**** | **.308**** | **.192*** | **.204*** | **.336**** |
| **Promedio General** | **.274**** | **.234*** | **.135** | **.149** | **.239**** |

*Nota* **Correlación significativa en el nivel .01 (bilateral), *Correlación significativa en el nivel .05 (bilateral)
*Fuente:* Elaboración propia

Regarding Table 4, and following Portillo (2011), the hypothesis tests must be considered, where the null hypothesis (H0) is: p = 0, and the alternative (H1) is: p ≠ 0; p being the linear relationship, the test statistic used would be Spearman's correlation, and the decision rule would be that if the significance yielded by the statistic is >.05, H0 is not rejected. By virtue of the above, positive correlations can be seen between some WAIS-IV test results and the academic performance of the students, such associations despite not being high, are located at statistically significant levels, some of them even at . 01; rejecting H0 in favor of H1, in parallel, the subjects Fundamentals of Computer Science and Anthropology did not present significant associations with other subscales, not rejecting H0, while the other subjects achieve correlations with the Total IQ and some association with at least one of the subscales evaluated with the WAIS IV, and these correlations, although ranging from low to weak, according to the levels proposed by Martinez et al. (2009) allow rejecting the null hypotheses.

## CONCLUSIONS AND DISCUSSION

It should be recalled that this research sought to determine the relationship between the IQ level of first semester students of the Psychology Program and their academic performance. When analyzing the results of the four indexes that make up the WAIS-IV test, it was found that 31% of the students present difficulties in verbal knowledge, 60% of the students in the interpretation and manipulation of visual information, 41% in the manipulation of information stored in memory and 4% present deficits in the ability to process non-verbal information quickly. According to Sattler (2010), the scores in the indexes are associated with the formal and non-formal schooling that a

subject receives in the early years, so it could be thought that the students evaluated presented difficulties since basic education. This low level, in part, could be related to the social issues of inequality and the low quality of life experienced in some regions of the Caribbean, conditions that permeate educational development in these communities, as stated by Akle and Monroy (2009) and Miranda-Galarza (2021).

Similarly, research conducted by Arias (2014) confirms that educations in conditions of poverty affect cognitive development, a difficulty that can last until the university context.

In the Total IQ it was found that only 5% of the students presented intelligence within the normal range and 55% of the students are located in the low average range. Of the remaining 40%, 39% of the students are located in the range of borderline intelligence and 1% of the students are in the extremely low range, which could be superficially and erroneously associated to a mild intellectual disability; especially when it is necessary to explain this phenomenon by various causes, one of which has to do with the socioeconomic stratum to which the population belongs, since 79% of the students are located in strata one and two, which coincides with the findings of Ardila et al. (2005), who consider that one of the causes of intellectual disability and borderline intelligence is the socioeconomic and cultural stratum from which the subject comes, as well as the low intelligence of the parents, the education received in poor cultural environments and deficient hygiene conditions. Another aspect that may explain this score is the lack of adapted scales for this population, which, as stated by several authors, leads to erroneous evaluations (Balluerka et al., 2007; Mikulic et al., 2007; Tovar, 2007).

Initially it was believed that people with IL could not access higher education; however, due to the apparent normality and the absence of physical conditions in these subjects, many times the difficulties go unnoticed (Huete & Pallero, 2016), from the above it can be seen that people access higher education, but with poor academic performance (León et al., 2012). In this order of ideas, it is necessary to train teachers and parents to identify warning signs in the early school years and get professionals in neuropsychological measurement to confirm the diagnosis by means of the criteria established in the DSM-V, in order to make early interventions that can improve the cognitive processes of this population, long before entering higher education institutions.

When analyzing the relationship between IQ and academic performance of first semester students, it was corroborated that the lower the IQ, the lower the academic performance in the university context. This association was found especially in subjects such as Biology and Environment, Introduction to Psychology, Study Techniques and Mathematical Logic, which coincides with the results of Salvador-Carulla et al. (2013), who found that low IQ scores are associated with low academic performance in subjects that include reading, writing and calculus, and in reasoning and attention tasks.

Despite the above, the relationship found in the present study between IQ and academic performance is low, which indicates that there are other aspects involved in this association; therefore, it could be reaffirmed that although intelligence is the factor that has the greatest weight in academic performance, there are other factors that can influence it. According to Marti (2003), in addition to intellectual performance, aspects such as personality, motivation, aptitudes, interests, study habits, self-esteem, the relationship between the teacher and the students, and the teaching

methods used, considerably affect academic performance. Likewise, Bertrams and Dickhauser (2009) consider behavioral factors, study habits, professional interests, school and family climate, school center and gender as variables influencing academic performance.

According to the above, educational institutions could implement selection processes for students entering education or could implement inclusion programs for students with IL and DI within the classroom. In line with the above, for Arias (2014), inclusion policies are required within universities that allow the successful academic development of students with low IQ, since higher education should be approached in a comprehensive and inclusive manner, so that such population, has the possibility to overcome their cognitive difficulties and become fit professionals. Likewise, Huete and Pallero (2016), consider that in order to achieve an inclusive education it is important to cover both the specific and academic curricular part, as well as the globality of the competency and legal framework defining the work environment, so as to facilitate access to employment for the person with intellectual disabilities in a more effective and inclusive way.

According to Lamas (2015) "what is really important and useful is to define the educational objectives to which we aspire, analyze the contexts and the difficulties we encounter, and generate proposals and mechanisms of action that allow us to move forward in achieving them" (p. 319). This is why the results of this study will allow higher education institutions in general to identify the need to implement programs to stimulate cognitive processes in students with intellectual disabilities in order to generate a positive impact on their academic performance, but also in other aspects of their lives. Inclusion programs of this type that have been carried out in other countries, agree that it is possible to promote aspects such as self-esteem and confidence, academic skills, autonomy and work skills (Cerrillo et al., 2013).

Thus, it is extremely important that higher education institutions develop strategies aimed at facilitating the academic life of young people with intellectual disabilities. For example, universities can implement student attention offices where academic and psychological reinforcement is integrated. Likewise, action plans should be developed to promote the participation of this population in higher education (Department of Education and Training, 1990), and to avoid the academic desertion of these students.

Finally, it is recommended that further studies be conducted to gain an in-depth understanding of other variables that may be associated with academic performance, such as the socioeconomic status of the students, the type of institution they come from, and the schooling of their parents. Similarly, it is recommended to follow up the students who participated in this study to determine if there is a relationship between IQ and student dropout, as well as periodic evaluations to determine if the cognitive processes and total IQ change throughout the course of study as a result of the demands of the course and if the intervention programs are being effective.

By virtue of the above, it is concluded that IQ is associated with academic performance in the population of interest and that academic performance in psychology students is mostly developed in the humanities, rather than in the exact sciences, hence some of the WAIS subscale scores were lower. Concomitantly, it should be noted that academic performance in the population is not 100% explained by the IQ level, which is associated, in the population of interest, with cultural aspects and therefore does not indicate the prevalence of intellectual disability in the population.

*Limitations*

The results only indicate the reality of the population of interest and do not allow for extrapolation; such data are also influenced by the lack of context-specific scales and untimely assessment that could serve as a guide to the students' status at the time of entry.

## REFERENCES


Akle, Á. R. y Monroy, L. A. G. (2009). El fracaso escolar en el contexto de la región Caribe colombiana. Una mirada desde el liderazgo formativo. *Revista Iberoamericana de Educación,* (51), 107-122. doi:10.35362/rie510629

Amador, J. A. y Forns, M. (2019). *Escala de inteligencia de Wechsler para niños, quinta edición: WISC-V.* http://diposit.ub.edu/dspace/bitstream/2445/127676/1/WISC-V.pdf

American Psychiatric Association. (APA) (2014). *Manual diagnóstico y estadístico de los trastornos mentales DSM-5 (5 ed.).* Editorial Médica Panamericana.

American Psychological Association. (1953). *Ethical standards of psychologists.* American Psychological Association. doi: 10.1037/1061-4087.45.2.10

Ardila, A., Rosselli, M. y Villaseñor, E. M. (2005). *Neuropsicología de los Trastornos del Aprendizaje.* UNAM.

Arias, W. L. (2014). *Estilos de aprendizaje e inteligencia en estudiantes universitarios de Arequipa, Perú.* Revista de estilos de aprendizaje, 7(14). http://revistaestilosdeaprendizaje.com/article/view/996/1704

Atuesta, J. y Vásquez, R. (2009). Coeficiente intelectual normal bajo... ¿normal? *Revista Colombiana de Psiquiatría, 38*(1), S99–S109.

Bahamón, M. M. y Reyes, R. L. (2014). Caracterización de la capacidad intelectual, factores sociodemográficos y académicos de estudiantes con alto y bajo desempeño en los exámenes Saber Pro - año 2012. *Avances en Psicología Latinoamericana, 32(3),* 459-476. doi: dx.doi.org/10.12804/apl32.03.2014.01

Balluerka, N., Gorostiaga, A., Alonso-Arbiol, I. y Haranburu, M. (2007). La adaptación de instrumentos de medida de unas culturas a otras: una perspectiva práctica. *Psicothema, 19(1),* 124-133. https://www.redalyc.org/pdf/727/72719119.pdf

Bertrams, A. y Dickhauser, O. (2009). High-school students´ need for cognition, self-control capacity, and school achievment: Testing a mediation hypothesis. *Learning and Individual Differences, 19(1),* 135-138. doi: 10.1016/j.lindif.2008.06.005

Cabello, S. M. (2007). Discapacidad y dificultades de aprendizaje: una distinción necesaria. *Revista de Investigación, 31(62), 55-70.* http://ve.scielo.org/scielo.php?pid=S1010-29142007000200005&script=sci_arttext&tlng=en

Cerrillo, R., Izuzquiza, D. y Egido, I. (2013). Inclusión de jóvenes con discapacidad intelectual en la universidad. *Revista de investigación en educación, 11(1),* 41-57.

Department of Education and Training. (1990). A fair chance for all. N*ational institutional planning for equity in higher education: a discussion paper.* http://hdl.voced.edu.au/10707/152620

Díaz, E., Ardila, M., Ramírez, A., Halliday, K. y Novoa, C. (2012). *Alteraciones neuropsicológicas de un paciente con enfermedad de Parkinson y antecedentes de consumo de sustancias psicoactivas. Psychologia, 6*(2), 59-72. doi: 10.21500/19002386.1184

Ferrero, A. (2007). La ética y la deontología profesional en la formación universitaria. El caso de la psicología. En Sanz Ferramola R. y Medina A. (Eds.), *Bioética en la Universidad. Hacia una ética de la corresponsabilidad en la comunidad del conocimiento, 36-48.* http://bioeticadeltrabajo.org/bioeticalaboral/content/enlauniversidad.pdf#page=3

Flórez, L. A., Acosta, D. S. y Restrepo-Ochoa, D. A. (2016). Neuropsicología de la inteligencia limítrofe. *Cuadernos de Neuropsicología, 10(2),* 129-141.

Frontera, M. y Gómez, C. (2013). Un estudio sobre la necesidad de reconocimiento, protección y apoyo a las personas con inteligencia límite. En Los mecanismos de guarda legal de las personas con discapacidad tras la Convención de Naciones Unidas. De Salas, M. (Coord.). 179-190. Universidad de Zaragoza.