

Psychology Students Attitudes Towards Statistics: A Field
Study on a Sample of Psychology Students at Djilali Liabes
University

اتجاه طلبة علم النفس نحو الإحصاء
دراسة ميدانية على عينة من طلبة علم النفس بجامعة جيلالي ليابس

Belhouari Fatima *

بلهوارى فاطمة

Fatima.belhouari@univ-sba.dz

Psychology work
and organization

University Sidi bel Abbes-
laboratory of psychological and
educational research

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Abstract:

This study aims to assess the level of psychology students' attitudes toward the importance of statistics in their academic program. We observed the presence of some misconceptions about this subject, and on the other hand, we noted the aversion of some students to this subject despite its importance in their academic program on one hand, and its importance in conducting their research on the other—especially for students nearing graduation preparing their theses. This study was conducted on a sample of psychology students (educational psychology and clinical psychology) at Djillali Liabes University of Sidi Bel Abbes. To address the study's topic, the researcher developed a questionnaire, relying on the theoretical framework and previous studies that addressed similar topics, as well as reviewing some scales. The questionnaire content focused on the importance of statistics, and the final form of the scale consisted of twenty items (20). It underwent

* Corresponding author: Fatima.belhouari@univ-sba.dz

psychometric properties testing for validity and reliability, and the results showed that it possesses both validity and reliability. The results concluded the following:

- There is a positive attitude among the study sample toward the statistics course.
- There is no difference in the level of attitude toward the statistics course attributable to gender differences.
- There is no difference in the level of attitude toward the statistics course attributable to specialization differences.

Keywords: Students' attitudes, psychology, statistics, questionnaire, psychometric properties.

ملخص:

تهدف هذه الدراسة إلى الوقوف على مستوى اتجاه طلبة علم النفس نحو أهمية الإحصاء في مساهمهم الدراسي، حيث لاحظنا وجود بعض التصورات الخاطئة نحو هذه المادة، والتمسنا من ناحية أخرى نفور بعض الطلبة من هذه المادة رغم أهميتها في مساهمهم الدراسي من جهة، ومن جهة أخرى أهميتها في إنجاز بحوثهم، خاصة الطلبة المقبلين على التخرج لتحضير مذكرات تخرجهم. وقد أجريت هذه الدراسة على عينة من طلبة علم النفس (علم النفس التربوي وعلم النفس العيادي) بجامعة جيلالي لياابس سيدي بلعباس. وللإجابة عن موضوع الدراسة، قامت الباحثة ببناء استبيان معتمدة في ذلك على الإطار النظري والدراسات السابقة التي تناولت مثل هذا الموضوع، وكذا الاطلاع على بعض المقاييس. وقد اقتصرحت محتويات الاستبيان على أهمية الإحصاء، وتكون المقياس في صورته النهائية من عشرين سؤالاً (20)، وقد خضع للخصائص السيكومترية من صدق وثبات، فتبين من خلال النتائج المحصل عليها أنه يتمتع بالصدق والثبات. وقد خلصت النتائج إلى ما يلي:

- يوجد اتجاه إيجابي لعينة الدراسة نحو مادة الإحصاء.
 - لا يوجد فرق في مستوى الاتجاه نحو مادة الإحصاء يُعزى لاختلاف الجنس.
 - لا يوجد فرق في مستوى الاتجاه نحو مادة الإحصاء يُعزى لاختلاف التخصص.
- الكلمات المفتاحية: اتجاه الطلبة، علم النفس، الإحصاء الإحصاء، استبيان، خصائص سيكومترية.

Introduction:

The importance of statistics is widely recognised, with statistical methods permeating most scientific fields and becoming a crucial part of the research process. These methods enable researchers to generalise their findings, organise and analyse data, and ultimately achieve important and accurate results.

Statistics have assumed a special significance in modern scientific research, since studies invariably involve statistical analysis. It has become difficult to make decisions without using

statistical methods. Statistics are no longer confined to the exact sciences and economics, but have also extended to the humanities and social sciences. Data processing and hypothesis testing require statistical techniques, making these methods important in many scientific fields. Consequently, researchers must be well-versed in statistical methods and their correct application.

Due to the importance of statistics, most university programmes have integrated them into their curricula as a course to enhance students' knowledge and understanding. Familiarity with statistical methods is essential for conducting research in many academic disciplines as it provides students with the knowledge and skills to collect and interpret relevant data (Somadi, 2008).

Moreover, attitudes are crucial factors in academic success, influencing students' ability to succeed or fail in various learning situations. Abada (2001) emphasises that individuals are better able to comprehend, understand and remember materials that are closely or loosely related to their interests and attitudes than materials that are irrelevant to them. Many students who choose social science majors experience an aversion to statistics due to the difficulties they encounter in grasping statistical concepts and their negative attitudes towards the subject. Therefore, this study aims to examine the significance of these two variables and reveal the level of attitudes towards statistics among a sample of psychology students at Sidi Bel Abbes University.

Research problem:

Quantifying phenomena and representing them with numbers lends a scientific character to the phenomenon under study. Consequently, the social sciences, including psychology, have increasingly relied on numerical data to achieve the objectivity and accuracy lacking in results based on subjective introspection. Therefore, statistics and its various methods have become an essential necessity for all sciences, including psychology, as the objective of psychological studies is to generalise their results to the population, which can only be achieved through statistical methods.

Recognising this importance, our article addresses the attitudes of psychology students towards statistics as a compulsory subject. Additionally, it highlights the need for statistics in answering research hypotheses for thesis completion.

We posed the following questions:

1. What is the level of the study sample's attitudes towards the importance of statistics?
2. Are there differences in students' attitudes towards the importance of statistics based on gender and area of study?

Theoretical framework:

1. Attitudes

The study of attitudes and an examination of their internal components play a significant role in determining current behaviour and predicting future behaviour by understanding the dimensions of attitudes towards external realities. Attitudes are perceived as organisational actions that encompass an individual's qualitative partial experiences. They serve to maintain the individual's identity and prevent them from scattering and losing focus in the face of external events.

People exhibit different characteristics, traits, emotions and knowledge, and these variations ultimately contribute to their attitudes towards others, topics and anything with a dialectical nature, such as disagreement or agreement. The degree of agreement or opposition depends on the information and emotional knowledge an individual has about the subject of their attitude.

An individual's responses to specific topics may be partially linked to past experiences and habitual positions encountered, whether cognitively or in relation to factual circumstances. Repeated exposure to certain ideas can hinder the ability to discard or change these views, even when presented with evidence proving their inaccuracy and ineffectiveness. Thus, an individual's attitude towards a particular behaviour tends to closely resemble their established norms.

Exposure to contradictory information regarding one's attitudes may not achieve the desired outcome of modification and change. Therefore, it is essential to consider the manner and quality of the information presented to individuals, as the way information is conveyed can significantly impact the modification process. This information must be both qualitative and quantitative to ensure effective adjustment and change.

1.1 Components of Attitudes:

An attitude is a psychological predisposition resulting from a person's perspective on a social, economic or political subject. Attitudes can be expressed verbally or behaviourally through

acceptance or neutrality, and they can be measured quantitatively. This definition considers the various extraneous variables that can be elucidated in several points.

1. Attitude as a Psychological Disposition:

An attitude should not merely be viewed as a quantity of information that causes an individual to adopt a stance, whether positive or negative. While information and knowledge are important in shaping an individual's attitude, psychological factors significantly influence the selection or rejection of that information. An individual's psychological makeup, including internal conflicts, heavily influences their perception of external subjects. Psychological processes compel individuals to adopt a general attitude based on the principle of stimulus generalisation. Personal experience plays a crucial role in forming overall attitudes, so any attempt to modify them must consider the individual's psychological traits and characteristics.

Attitudes consist of three main components:

1. Cognitive Component:

This refers to all the information available to the individual. This information influences the formation and shaping of a specific attitude. The more consistent and aligned this information is with the individual's psychological structure and reference standards, the more resistant the attitude is to change.

2. Affective component:

The more an individual is emotionally and psychologically impacted by the subject of their attitude, the stronger it will be and the more difficult it will be to influence. This emotional component may cause individuals to engage with the cognitive component in a more selective manner, meaning they tend to seek information that aligns with their feelings and emotions.

3. Behavioural Component:

Individuals always act based on information and emotions. Therefore, modifying behaviour requires altering both the cognitive and affective aspects.

2. How Attitudes are Formed:

There are many sources that play a crucial role in shaping an individual's attitude. Mohammed Mustafa Zidan (n.d.: 170) summarises these elements as follows:

1. Uncritical acceptance of social norms through suggestion:

Suggestion is one of the most common factors, as individuals often accept a certain attitude without having direct contact with the objects or subjects related to that attitude.

2. Generalisation of experiences:

The second way in which individuals acquire their attitudes is by generalising experiences. Acquiring a particular standard enables individuals to apply it to their public and private lives.

Functions of Attitudes:

1. They give meaning and significance to an individual's perceptions and activities.
2. They help individuals achieve their goals.
3. They organise motives, perceptions and other psychological factors in a coherent and integrative manner that influences and aligns with the environment.

3. Importance of Attitudes:

Studying attitudes and examining their internal components plays a significant role in determining current behaviour and predicting future behaviour by understanding the dimensions of attitudes towards external realities.

Statistics:

Definition of statistics:

The concept of statistics is ancient. For example, the Greek historian Herodotus mentioned that a military leader used a simple method to count his army (Taha Hussein Al-Zubaydi, 2013).

Amtiir Muftah (2015) states that 'statistics is defined as the science concerned with collecting, presenting, analysing and interpreting data, with numerous applications in various fields of life, including economics, sociology, biology and others' (Amtiir Muftah, 2015: 9).

Salih Ahmed Mourad (2011) adds that statistics are defined as the counting or enumeration of things and data, with the term 'counted' meaning to tally the number of items, and perhaps their characteristics. Statistics is a branch of science that deals with data, analysing and organising it to answer questions and draw inferences.

Saadi Shakir Hamoudi (2009) further explains that statistics encompasses a set of methods, tools, rules and laws based on logical analysis. These are utilised as the best means to measure and analyse phenomena and facts, derive conclusions and present them in a suitable manner to clarify the relationships among them (Hamoudi, 2009: 9).

The importance of statistics in application:

Given its use in various and diverse fields, statistics has become synonymous with its applied scientific domain. Statistics have played a prominent role in advancing psychology and the measurement methods used within it. This development has encompassed areas of psychological and educational research.

Learning statistics is essential not only for fundamental scientific research, but also for anyone involved in education and psychology. The scope of statistics has expanded beyond merely collecting numerical data and presenting it in tables and charts to include extracting means and standard deviations and utilising these in the interpretation of results and the testing of hypotheses by examining the correlation, or lack thereof, between variables within the study. It also facilitates the determination of statistically significant differences between study variables.

Statistics aligns with the scientific method of experimentation and the extraction of objective results through the processes of applying and analysing results, preceded by formulating a hypothesis for the problem at hand. A hypothesis is a proposed answer to a research problem.

Previous Studies:**1. Study by Abdel Ghani Barakliya (2020):**

This study aimed to investigate the attitudes of master's students in the Department of Social Sciences toward statistics. A field study was conducted on a sample of social science students at Ibn Khaldun University in Tiaret. To achieve the study's objectives, the researcher employed an attitudes scale toward statistics and applied the study to a sample of 100 students. The results revealed positive attitudes among the study sample toward statistics, with no significant differences in attitudes related to gender. However, differences were noted based on the baccalaureate stream, favoring the science stream.

2. A study by Kamel Salim and Adel Atiyah Rayan (2009):

This study aimed to explore students' attitudes towards statistics at Al-Quds Open University and their relationship with academic achievement, considering certain variables. To achieve the study's objectives, the researchers applied the statistics attitude scale developed by Hilton and colleagues to a sample of 152 students selected through stratified

random sampling, ensuring its psychometric properties. The results of the study indicated that students at Al-Quds Open University had negative attitudes towards statistics.

3. Study by Ayoub Mohammed Suwaileh Al-Otaibi (2022):

This study aimed to explore the nature of the relationship between attitudes towards statistics and learning motivation among graduate students on the Measurement and Evaluation programme at Umm Al-Qura University. The study was conducted on a sample of 50 students selected through random sampling. Attitudes toward statistics and learning motivation were assessed using scales. The results showed positive attitudes towards statistics, with no significant gender-based differences.

4. Study by Souheila Boudjlel:

This study aimed to identify the nature of students' attitudes towards statistics at Hassiba Ben Bouali University in Chlef, in relation to certain variables. A questionnaire developed by Hilton and colleagues was administered to a sample of 100 students. The results revealed moderately positive attitudes towards studying statistics, with significant differences attributed to specialisation and academic level.

5. Study by Chaima Khadraoui (2020):

This study aimed to explore the relationship between attitudes towards statistics and problem-solving skills among psychology students at M'sila University. Data were collected using the Attitudes Scale towards Statistics developed by Abdullah Al-Samadi (2008), and a random sample of 92 students was selected. The results indicated:

- No significant differences in attitudes towards statistics related to gender.
- No significant differences in attitudes towards statistics related to specialisation.

The applied aspect:

Study population:

The study population consisted of psychology students enrolled in the following specialisms:

- Third-year Educational Psychology
- Third-year Clinical Psychology
- First-year Master's in Clinical Psychology

at the Faculty of Humanities and Social Sciences, Djilali Liabes University, Sidi Bel Abbes.

Sample of the study:

The sample was selected using cluster random sampling, whereby one group was randomly chosen from each specialisation.

Method of application:

After identifying the groups to be studied, the researcher used a timetable to determine the best times to administer the questionnaire, i.e. during class periods when teaching occurs in groups. The application was conducted collectively with the help of faculty members.

Research Methodology:

This study employed a descriptive methodology, as the nature of the topic required the phenomenon to be described, analysed, and conclusions and generalisations drawn about the original population.

Characteristics of the study sample:

Regarding gender,

Table 1: illustrates the distribution of the sample by gender.

Gender	Frequency	Percentage
Females	29	%74.64
Males	10	%25.64
Total	39	%100

As can be seen from the table, the percentage of females exceeds that of males, reflecting the fact that the total number of females in the Psychology Department surpasses the total number of males across all specialisations.

Distribution of the sample by specialisation:

Table 2: illustrates the distribution of the sample by specialisation.

Specialisations	Frequency	Percentage
Educational Psychology, Third Year	21	%53.84
Clinical Psychology, Master's Program, First Year	18	%46.15
Total	39	%100

Psychometric properties of the questionnaire:**Reliability:**

The questionnaire's reliability was evaluated using internal consistency, split-half reliability and Omega. The statistical analysis yielded the following results:

Results of split-half reliability:

Table 3: illustrates the reliability results.

Split-Half Reliability	Correction Coefficient	Cronbach's Alpha	Omega
0.77	0.87	0.86	0.88

Based on the results in Table 3, it is evident that the instrument is reliable, as all the calculated reliability values exceed 0.5.

Validity:

Validity was assessed through internal consistency, examining the relationship between each item's score and the overall test score. The results are as follows:

Table 4: illustrates the correlation coefficients between each item and the overall test score.

Question	test	R value
Q1		,684**
Q2		,000
Q3		30
Q4		,744**
Q5		,000
Q6		30
Q7		-,297
Q8		,111
Q9		30
Q10		,688**
Q11		,000
Q12		30
Q13		,379*
Q14		,039
Q15		30
Q16		,763**

Q17	,000
Q18	30
Q19	,542**
Q20	,002

Based on the results in Table 3, it is evident that the instrument is reliable, as all the calculated reliability values exceed 0.5.

Validity:

Validity was assessed through internal consistency, examining the relationship between each item's score and the overall test score. The results are as follows:

Table 5: illustrates the correlation coefficients between each item and the overall test score.

Questions	Number	Mean	Standard deviation
Q1	39	3,9744	,87320
Q2	39	3,7692	,90209
Q3	39	3,0513	1,29673
Q4	39	4,2051	,80064
Q5	39	4,2564	,84970
Q6	39	3,5641	1,29361
Q7	39	3,5128	1,23271
Q8	39	3,5897	1,20782
Q9	39	2,8718	1,05580
Q10	39	3,1538	1,20391
Q11	39	2,7692	1,26619
Q12	39	4,2308	,84173
Q13	39	3,0513	1,25549
Q14	39	4,0513	1,02466
Q15	39	4,2564	,90954
Q16	39	3,2564	1,16343

Q17	39	3,0000	1,29777
Q18	39	3,5128	1,39306
Q19	39	4,1282	,89382
Q20	39	3,6667	,98230

As can be seen from the table, the mean scores for most items exceeded the theoretical mean. To determine the significance of these differences, we performed a one-sample t-test.

Table 6: illustrates the results of this test.

Question	T value	Freedom degree	Statistical significance
Q1	6,968	38	,000
Q2	5,325	38	,000
Q3	,247	38	,806
Q4	9,400	38	,000
Q5	9,234	38	,000
Q6	2,723	38	,010
Q7	2,598	38	,013
Q8	3,049	38	,004
Q9	-,758	38	,453
Q10	,798	38	,430
Q11	-1,138	38	,262
Q12	9,131	38	,000
Q13	,255	38	,800
Q14	6,407	38	,000
Q15	8,627	38	,000
Q16	1,376	38	,177
Q17	,000	38	1,000
Q18	2,299	38	,027
Q19	7,883	38	,000
Q20	4,238	38	,000

The results indicate a significant difference in favour of the sample, with a p-value of 0.0001. This suggests that the sample has a positive attitude towards statistics. These findings align with those of Ayoub Mohammed Suwaileh Al-Otaibi (2022), Souheila Boujalal (2019) and Abdel Ghani Barakliya (2020). However, the results differ from those of Adel Atiyah Rayan (2009), who found a positive, albeit weak, attitude.

Hypothesis Two:

There is a difference in the level of attitudes towards statistics attributed to gender.

Table 7: presents the results of the independent samples t-test.

Gender	Mean	T value	Freedom degree	Statistical significance
Male	74.80	0.9	37	0.36
Female	70.86			

The results obtained indicate that there is no difference in attitude towards the subject of statistics between males and females. Both groups recognise its importance in their academic journey. Despite their apprehension regarding the subject, they pay attention to it because it will help them analyse their study results. These findings are consistent with those of Abdel Ghani Barakliya (2020), Chaima Khadrawi (2020) and Ayoub Mohammed Suwaileh Al-Otaibi (2022).

Hypothesis Three:

There is a difference in attitudes towards statistics depending on specialisation.

Table 8: presents the results of the independent samples t-test.

Specialisation	Mean	T value	Freedom degree	Statistical significance
Clinical Psychology, Master's Programme	74.72	1.43	37	1.63
Educational Psychology, third year	69.42			

The results indicate that students' attitudes towards statistics do not differ based on their area of specialisation. Statistics has become an important subject that helps students complete their theses and supports them in their professional development. These findings are consistent with those of Chaima Khadrawi (2020), but differ from the results of Fatoum Wali (2018), who identified differences in attitudes towards statistics based on specialisation, as well as those of Souheila Boudjelal (2019).

The lack of differences in the means of the sample across specialisations (clinical and educational) can be explained by the similarity of the sample characteristics. Students study this subject with similar professors who are committed to simplifying statistical concepts and emphasising the importance of statistics in helping students to interpret the results of their hypotheses.

Conclusion:

One of the most distinguishing features of contemporary society is the precision and comprehensiveness of measurement, which now encompasses aspects previously considered immeasurable, such as psychological and social dimensions. Consequently, proficiency in statistical knowledge has become essential for students in these fields, as it provides the fundamental tools that are necessary for psychologists to practise their profession effectively.

Although programmed statistical software enables the use of statistical tools to test hypotheses, it does not specify the most suitable statistical method for a given design. Using inferential statistics requires researchers to understand the nature of variables, select the appropriate statistical tool for hypothesis testing and make decisions based on the results.

The choice of test depends on the researcher's understanding of the nature of the hypotheses and how to formulate them, including the variables involved. The relationship between social science specialists, particularly psychologists, and numbers is unique and differs from that in other disciplines, such as mathematics or physics. They engage with the qualitative aspect of these numbers, relating the obtained results to a set of dimensions rather than merely settling for them.

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