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**| RESEARCH ARTICLE**

## **Exploring the Relationship between ChatGPT Use and University Students' Syntactic Argumentation**

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**| ABSTRACT**

This study preliminarily explores the relationship between the use of ChatGPT as an AI tool and Moroccan university students' linguistic argumentation, taking syntax as a case study. This research project aims to better understand how tools like ChatGPT may influence students' reasoning and argumentative skills in the field of syntax. A quantitative research design was adopted, using questionnaires distributed to 91 Moroccan EFL students from various educational levels (B.A., Master's, and doctoral studies). Our main finding is that the majority of students used ChatGPT to solve issues related to theoretical linguistics. Nevertheless, the majority either stayed neutral or had negative attitudes towards ChatGPT improving their ability to critically analyze syntactic data and are confident to analyze data without ChatGPT. The implication behind this research is the cautious attitude towards using ChatGPT: It is used as a means but never a replacement for the traditional learning process.

**| KEYWORDS**

Artificial Intelligence, ChatGPT, Syntactic Argumentation, Syntactic Analysis

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### **1. Introduction**

Artificial Intelligence has been discussed in many fields, and linguistics is no exception. The question of ethics has always been crucial in academic culture. Hence, the rise of Artificial Intelligence has prompted educators to ask questions regarding its use. Proponents encourage its use as a tool that helps students better understand the subject in question, while opponents discourage its use, believing it hinders students' development.

The rationale behind this study is the increasing use of ChatGPT in universities. Our objectives are as follows: First, we would like to explore the attitudes of students towards using ChatGPT, and second, we want to discover the implications of using ChatGPT on students' critical thinking skills and syntactic argumentation.

We define syntax as the scientific study of the internal structure of sentences. As for argumentation, we rely on Andrews (2010), who defines it as a process that "operates more deductively, through linking concepts or propositions to each, underpinned at the concrete level by evidence" (p. 32). Therefore, syntactic argumentation will be defined as identifying the links between syntactic data and established syntactic concepts by using theoretical or empirical evidence.

If we look at the literature, numerous papers are published every day on the impact of ChatGPT on different fields (i.e., education, medicine and health, computer science, engineering, social sciences, humanities, and natural sciences, among others). Some studies have examined the relationship between ChatGPT usage and different theoretical linguistic fields and issues like phonology (Cho et al., 2025) and morphology (Hasbullah et al., 2025; Manova, 2023). If we narrow down the use of ChatGPT to answer questions regarding syntax, which is a theoretical field, only a few studies have also been done. These are Habibi (2024), Casanovas (2025), and Dewanti et al. (2025). With that being said, if we go further, none of these studies addressed generative

syntax, which is different because the field is similar to mathematics in terms of argumentation, but at the same time, it mixes with social science since the human aspect of language cannot make it fully a pure science.

## **2. Methodology**

The research is exploratory in nature since it is a preliminary outlook on a topic that has not been exhaustively studied. It is also a quantitative research design since the data were collected using a self-designed Questionnaire (i.e., Likert-scale questions) with 13 items, though there are some qualitative aspects whereby students were asked about their attitudes towards the topic in question (i.e., open-ended questions).

The Questionnaire was distributed to Ibn Tofail University students in Kenitra, Morocco, using the online platform, Google Forms. The data was collected starting from June 15th, 2025, and it was not only collected using an online questionnaire; we also relied on another instrument, which is the unstructured observation of both Bachelor's and master's classes throughout the years. In these observations, both participant and non-participant observation were undertaken. That is, we personally assessed the use of ChatGPT in syntactic argumentation and observed its use by students during classes, which also included formative assessments. To reduce observer bias, the notes only included repeated patterns and not isolated incidents. Regarding the sample size and participants, 91 students completed the questionnaire, with 50.5% identifying as female and 49.5% identifying as male; this ensures that age will not be an intervening variable. As for the age range, 13.2% are in the 18-21 range, 26.4% are in the 22-26 range, 13.2% are in the 25-27 range, and more than 47% are 28 years old or more. The educational background of the participants varied, with 59.3% undergraduate participants and 40.7% of graduate participants.

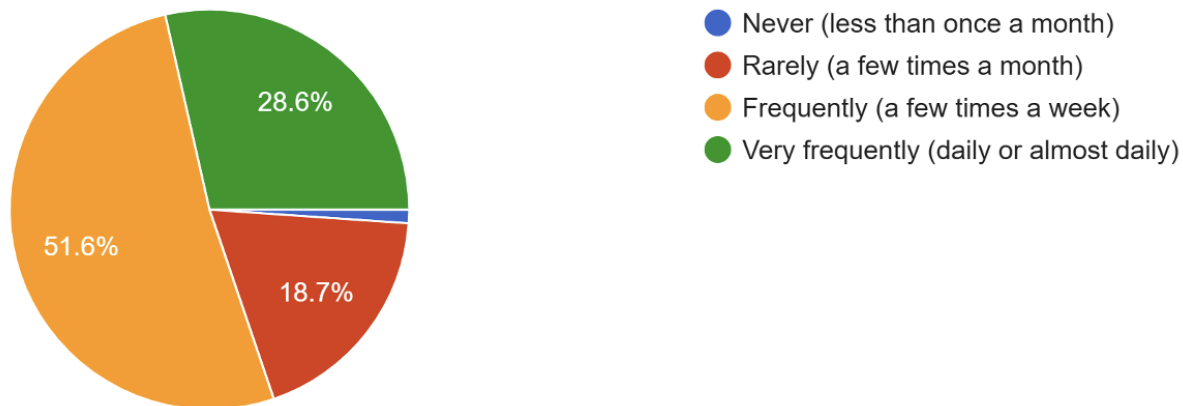
## **3. Results**

### **3.1 Preliminaries: ChatGPT Usage Frequency, Purpose, and Area of Focus**

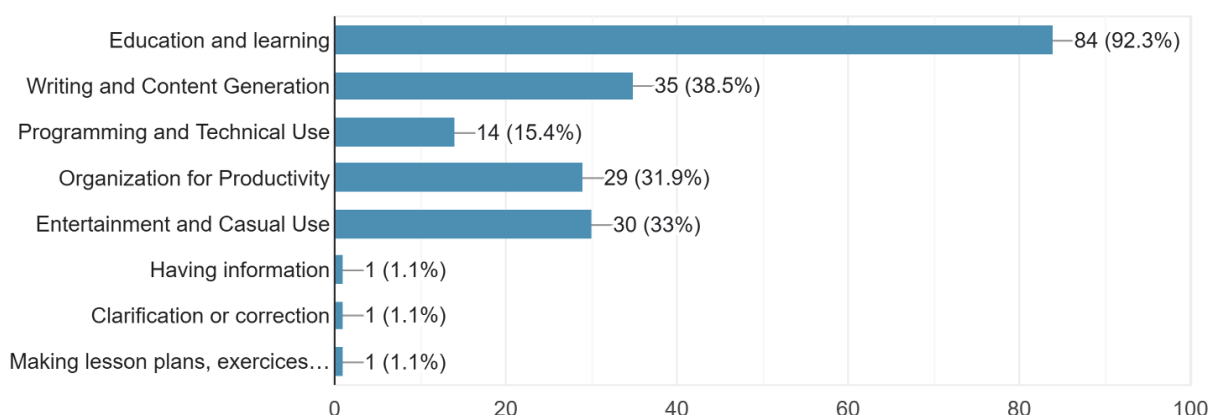
Students were asked whether they use ChatGPT in their everyday tasks. 72.5% confirmed whereas 27.5% said they do not use it daily. In order to be specific, we only asked the participants how often they use ChatGPT, which is represented visually in the figure below:

**Figure 1**

*The Frequency of Using ChatGPT*

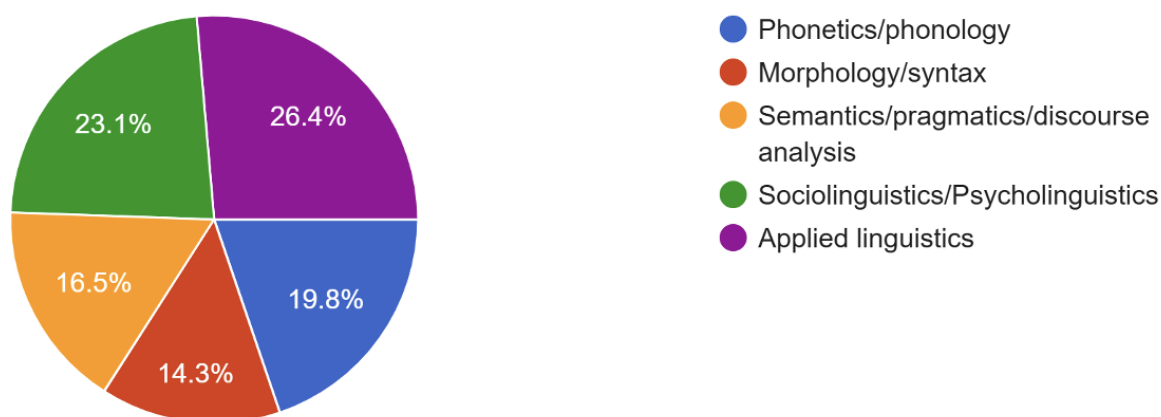


Generally speaking, 80% stated that they use ChatGPT frequently, with approximately 29% identifying daily or almost daily usage. These two questions are essential since now that we know students do benefit from ChatGPT, our next question is to find out the purpose. Consider the following figure:

**Figure 2***The Purpose of Using ChatGPT*

As we can see, 92.3% consume ChatGPT for education and learning purposes whereas 38.5% use the tool for writing and content generation purposes. We sought to go from general to specific to make sure students have a daily relationship with ChatGPT in their daily lives, especially in education.

For context, students were asked which area of linguistics they use the most with ChatGPT. 61.5% said they ask questions regarding macrolinguistics (i.e., sociolinguistics, psycholinguistics, and applied linguistics, among others), and the rest of the 38.5% said they ask questions concerning microlinguistics or theoretical linguistics matters (i.e., phonology, morphology, syntax, and semantics). When it comes to microlinguistics, the following figure showcases specific students' interests:

**Figure 3***Specific Areas of Theoretical Linguistics Used with ChatGPT*

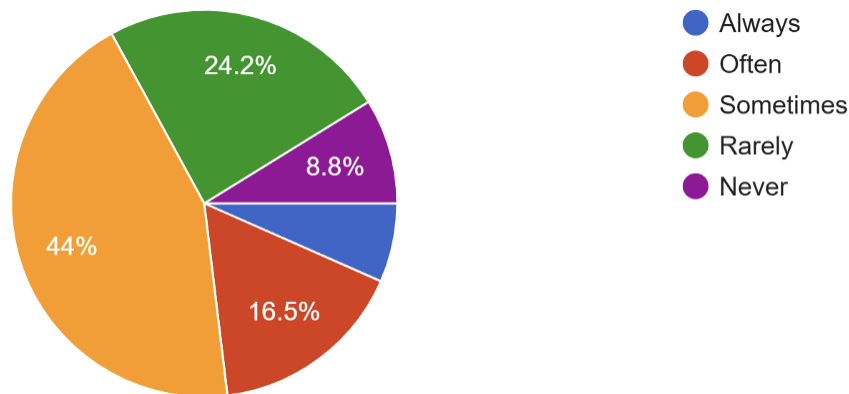
Students' options vary depending on their needs. On the one hand, some students search for macrolinguistics matters for the sake of writing and content generation. On the other hand, according to a participant testimony, they say: "I utilize ChatGPT with micro-linguistics more than macro-linguistics because micro-linguistics is too abstract and it delves into things that are not concrete whatsoever." This means that students rely on ChatGPT in order to make abstract syntactic notions clearer. This is apparent since students were asked directly in the questionnaire if they use ChatGPT in order to solve issues related to theoretical linguistics or syntax, and 68.1% said they did. Now, we need to find out whether this usage was actually beneficial or detrimental, which is the concern of our next section.

**3.2 Using ChatGPT for Enhancing Syntactic Argumentation**

Let us present the participants' opinions on whether ChatGPT enhanced their syntactic argumentation, and then we will discuss the findings. Participants were asked how often they rely on ChatGPT to answer questions for them in relation to syntax; these were the following results:

**Figure 4**

*The Frequency of Relying on ChatGPT to Answer Syntax Questions*



Based on the figure above, it appears that there are mixed results regarding the use of ChatGPT. Whereas over half of the respondents (60.5%) either often or sometimes use ChatGPT for syntax-related questions, 33% use it rarely or never. These preliminary observations already give us non-conclusive results and raise many exploratory questions regarding this issue. Let us now look at the following Likert-scale table, which explores several points regarding the issue:

**Table 1**

*Distribution of Agreement with Statements about ChatGPT in Syntactic Argumentation*

Item	Agree (%)	Neutral (%)	Disagree (%)
1. ChatGPT improves my ability to critically analyze syntactic data.	47.3	33	19.8
2. ChatGPT makes it harder for me to critically analyze syntactic data because it does the analysis for me.	34.1	30.8	35.2
3. I use ChatGPT to check my answers to syntax exercises to ensure I am correct.	63.7	18.7	17.6
4. I use ChatGPT to directly get answers to syntax exercises without attempting to solve them on my own.	17.6	20.9	61.6
5. I use ChatGPT in order to better understand syntactic concepts.	71.5	15.4	13.2
6. I use ChatGPT in order to get references on syntax.	61.5	22	16.6
7. In my experience, ChatGPT provides accurate syntactic analyses.	31.9	33	35.2

When it comes to surface-level syntactic research, we find obvious results. For example, in Item 6, 61.5% use ChatGPT to get references on syntax. Similarly, 71.5% use ChatGPT to better understand syntactic concepts, which require no exercises and little argumentation.

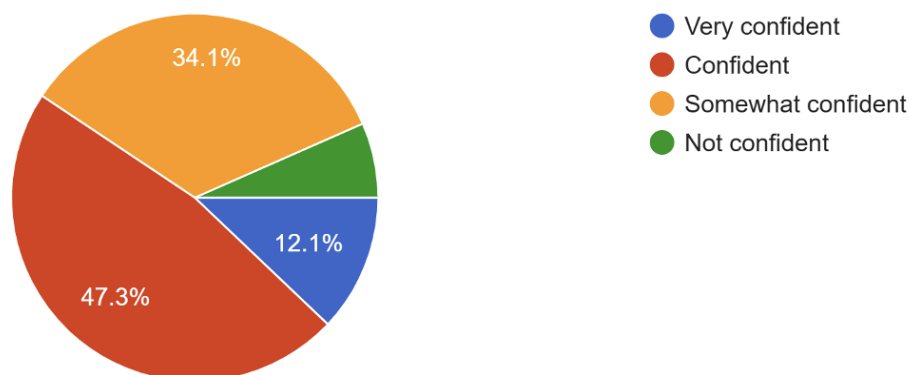
However, if participants use ChatGPT for more complicated situations like analyzing syntactic data (see Items 1 and 2) or checking its accuracy in that regard (see Item 7), the results become very split. In other words, in Item 2, 34.1% agreed, 30.8% stayed neutral, and 35.2% disagreed on whether ChatGPT makes it harder for students to analyze syntactic data because it does the analysis for them. Similar divided results are shown in Items 1 and 7. This shows that this is not a black-and-white situation. Notice also how there are no extreme answers in these questions, which shows that the issue of ChatGPT in syntactic analysis is delicate. This is also strengthened in students' testimonies: On the one hand, a participant states that "ChatGPT is useful for analyzing syntactic data because it provides examples and supports theoretical frameworks." On the other hand, another participant contends that "AI's programs are still insufficient in resolving linguistic tasks, especially theoretical linguistics."

When it comes to the ethical use of ChatGPT, 64% stated that they use ChatGPT to check answers to syntax exercises to ensure they are correct (see Item 3). To prevent response bias and ensure reliability, the question was asked differently in Item 4, and the answers were as expected: 61.6% disagreed on using ChatGPT to get answers to syntax exercises without attempting to solve

them on their own. Still, it raises concerns that 17.6% admitted to breaching ethical conduct and used ChatGPT to answer without attempting to make an effort. The last question we leave is how confident students are in using ChatGPT, and it shows that only 6.5% are not confident, as shown in the figure below:

**Figure 5**

*Confidence in Analyzing Syntactic Data Without Using ChatGPT*



When it comes to the participants' testimonies, they reveal both positive remarks and critiques, which are summarized in the following table:

**Table 2**

*Positive and Negative Remarks Regarding the Use of ChatGPT in Syntactic Analysis*

Positive Remarks	Negative Remarks
Providing examples	Useful for 'quick' syntax only
Supporting theoretical frameworks	Inaccuracy and mistakes (especially () syntax trees & (2) complex input)
Summarizing, categorizing, and identifying patterns in text	Overgeneralizations
Checking answers immediacy	ChatGPT–classroom syntactic divergence
Helping to learn the line of reasoning and implementing it	Over-reliance resulting in blocking thinking

#### 4. Discussion

There are several points to discuss regarding the issue of using ChatGPT and AI, in general, for theoretical linguistics. First, as Hdouch (2025) states, one question we should ask ourselves is the following: "What problems should we ask AI for help and what problems should we keep to ourselves?" Based on the results from the questionnaire, it seems that relying on ChatGPT for references, basic syntax questions, and syntactic concepts is acceptable; however, more complicated situations, such as questions that require linguistic argumentation and complex analyses, are where we should keep to ourselves. Hdouch (2025) clarifies further that the goal of academia is to take students from a stage of dependence to a stage of independence. Indeed, overreliance on AI will not help smoothly transition to the expected student autonomy. Hdouch (2025) adds that if students accept AI just like that, then that is where critical thinking arrives. This means that the responsibility lies on the student, and they have to decide whether they have the desire to know or the desire to learn (Hdouch, 2025).

Second, some participants admitted that ChatGPT does not help with complex input. The question that arises is, why do they still use it? This can be explained by the concept of cognitive offloading (Morrison & Richmond, 2020; Risko & Dunn, 2015; Sweller, 2003). It is defined as "a form of metacognitive control based on a subjective assessment of the relative costs/benefits of integrating an external process versus performing a given cognitive function while relying completely on internal means" (Risko & Dunn, 2015, p. 62). This means that students use ChatGPT as an external source to offload or reduce internal mental effort. This leads to the loss of academic voice and cognitive misplacement (Bekou, 2025).

Third, some of the participants commented on the inaccuracy aspect. This is one of the key challenges of AI. According to Boujnoun (2025), there are three key challenges at the academic publishing level. These are authorship, verification, and reliability. The third challenge means that "AI may generate fabricated citations, invented data and statistics, and factually incorrect statements" (Boujnoun, 2025). Based on observation, it appears that we can find challenges even on the surface level. That is, even a basic search of references, as done by 61.5% of participants (see Table 1, Item 6), is problematic.

## 5. Conclusion

In this paper, we looked at the relationship between using ChatGPT and students' syntactic argumentation. We found mixed results: Whereas ChatGPT can mainly be used in surface syntax matters, it can produce hallucinations at the level of complex syntactic analyses. In fact, hallucinations were also observed at the level of surface syntax in terms of basic reference searches. We also saw the psychological and ethical implications of using ChatGPT in syntax: It produces cognitive offloading and dependence that undermines student autonomy.

Nevertheless, this study aimed to highlight the infiltration of AI even in theoretical linguistics, to reinforce a balanced outlook on its positives and negatives, to enter the discussion as educators since the age of AI is here to stay, and to be attentive to students' needs, attitudes, and opinions on the matter.

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